



Questioned Documents Examination Test No. 18-521 Summary Report

Each sample pack consisted of three questioned photocopied notes (Q1-Q3) and blank, known exemplars produced on two photocopiers (K1a-c, K2a-c). Participants were asked to compare the known exemplars to the questioned notes to determine if either of the photocopiers had been used in the production of the questioned notes. Data were returned from 214 participants and are compiled into the following tables:

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This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample set contained three questioned items and two sets of known exemplars. Items Q1, Q2, and Q3 were each a single photocopied page containing cut-and-paste style text issuing accusations and threats to the receiver. Items K1 and K2 each contained three blank exemplar pages created on two photocopiers in question. Participants were asked to determine if either of the known photocopiers, as represented by the exemplars, were used in the production of any of the questioned items.

SAMPLE PREPARATION-

Each photocopier to be used was artificially trash marked on the glass platen prior to production of the exemplars.

Each questioned document was created by simulating text cutouts using varied fonts and colors in Adobe Photoshop, then printing these items on Epson photo paper. The Q1 and Q3 original documents were placed face-down on the platen of the photocopier used to produce K2 and individually copied. The position of Item Q3 was rotated 180 degrees from the position of Item Q1 during the copying process. The Q2 original document was placed face down on the platen of the photocopier used to produce K1 and copied.

The known exemplars were created by placing a blank piece of white Staples brand multiuse paper on the platen of each photocopier and producing three copies per sample set.

All copies were printed on white Staples brand multiuse paper using black and white photocopier settings. All questioned and known items were labeled on the back side of each copy with an item number label.

SAMPLE SET ASSEMBLY-

After visual quality reviews were complete, all items were packed. Known exemplars K1 and K2 were placed between protective chipboard and packaged into their respective labeled envelopes and sealed. Questioned items were packaged together into a single labeled envelope, separated by protective chipboard, and sealed. Following predistribution testing, item envelopes were packaged into a sample set envelope and sealed.

VERIFICATION-

Predistribution examiners determined that the photocopier used to produce K1 was used in the production of Item Q2, and the photocopier used to produce K2 was used in the production of Items Q1 and Q3. This was supported by the following observations: shared printing processes for K1/Q2 (inkjet) and K2/Q1/Q3 (toner); individualizing, unique patterns of trash marks between K1/Q2 and K2/Q1/Q3; and the presence of matching machine indentations on K2/Q1/Q3.

Summary Comments

Each sample set consisted of three questioned photocopied notes (Q1-Q3) and blank, known exemplars produced on two photocopiers (K1a-c, K2a-c). An investigation was requested in order to determine if either of the known photocopiers was used in the production of any of the notes. The Q2 note was produced on the yearbook classroom photocopier, K1; the Q1 and Q3 notes were produced on the library photocopier, K2 (Refer to the Manufacturer's Information for preparation details).

As recorded in Table 1, the responses to the question "Based on the findings of your examination, could any of the photocopiers, as represented by the known exemplars, be used in the production of the questioned notes (Q1, Q2, Q3)?" can be summarized as follows:

208 out of 214 participants (97%) reported the expected photocopier associations (responses A or B) for all three questioned items. In the case of both expected associations and non-associations (responses D or E), 175 out of 214 participants (82%) reported the expected response for both photocopiers across all three questioned items. Outliers to the consensus, as indicated in Table 1, are as follows:

Five participants reported "Cannot Determine" (response C) for comparisons where the consensus was non-association. The stated reason for this conclusion is that it cannot be ruled out that the known photocopiers could have been used at some intermediate stage of creation of these questioned notes. Two participants stated that neither K1 nor K2 was used in the production of Q1. Three participants stated that neither K1 nor K2 was used in the production of Q3. One participant did not complete the chart as instructed and reported "X" where the consensus was an association; this participant left the other response fields blank.

Participants reported one or more of the following observations to support the findings related to each photocopier and questioned item: unique trash marks associated with each photocopier aligned with marks found on associated questioned items (K1/Q2; K2/Q1/Q3); printing processes corresponded between photocopiers and their associated questioned items (K1/Q2 – color inkjet; K2/Q1/Q3 – B/W toner); and indentations of machine roller marks corresponded between Items K2, Q1, and Q3. Some participants also observed that the trash marks on Item Q3 appeared in an opposite orientation from those on Item Q1 and the K2 exemplars.

Across the 214 responding participants, 654 methods of analysis were reported in total. The most commonly reported techniques used were Video Spectral Comparator (VSC), reported 122 times, and Microscopic Examination, reported 120 times; these were primarily used to confirm printing processes and identify trash marks. Other frequently reported methods include Visual Examination (83), Overlays (74) for trash mark alignment, and ESDA (67) for machined and writing indentation detection. The methods listed in the response summary are the preloaded options for selection via the CTS Portal and do not reflect all answers provided by participants.

Examination Results

Based on the findings of your examination, could any of the photocopiers, as represented by the known exemplars, be used in the production of the questioned notes (Q1, Q2, Q3)?

TABLE 1 - Q1

WebCode	Q1		WebCode	Q1		WebCode	Q1	
	K1	K2		K1	K2		K1	K2
22AUHV	E	A	4TR6U8	E	A	9694LP	E	A
26ADTM	E	A	4XYQKP	E	A	97YGFN		A
27L6QB	D	A	646L4P		A	9A26M4	E	A
2BY6M3	E	A	64NTLL	E	A	9DZW2P	E	A
2EVRGQ	E	A	6A9TG8	E	A	9HV9TL	E	A
2FQRMW	E	A	6G8DLN	E	A	9ML3V9	E	A
2J8P3R	E	A	6HQK3K	E	A	9Y3P69	E	A
2K43PK		A	78JJAR		A	A3W2K7		B
2LF8EP		A	79B8EL	E	A	A6NM7M	E	A
2YZEXN	E	A	7BJPQH	E	A	A93W47	E	A
34E68P	E	A	7P3BBC	E	A	AATZT7	E	A
3AJHUA	E	A	7V97UC	E	A	APWJZ	E	A
3DJCMP	E	A	7VLBDM	E	A	AT8ZWL	E	A
3K2UVQ	E	A	87KGQL	E	A	AW7CTL	E	A
3KX8JJ	E	A	8CBBT9	E	A	AXKJE3	E	A
3YXENV	E	A	8LUAC4	E	A	B2WKHT	E	A
43UVMM	E	A	8MQHQE	E	A	BB8L39	E	A
48PMVK	E	A	8UBLVW	E	A	BHKXWK		A
4HAN3Z	E	A	8WWP4U	E	A	BLHGWX	E	A
4PQYF2	E	A	8YN29N		A	BMWDDG	E	A
4QL34N	E	A	8ZWL6G	C	A	BVAUYH		A

TABLE 1 - Q1

WebCode	Q1		WebCode	Q1		WebCode	Q1	
	K1	K2		K1	K2		K1	K2
BXZJCP	D	A	EMP3AA	E	B	HQWQKG	E	A
BYU8RY	E	A	EWGC3D	E	A	HT2BA2	E	A
C4KB84	E	A	EX3XEU	E	A	HYBJQ7	E	A
C7Q3QX	E	A	EXP4ZF	E	A	JD37JY	E	A
C9VRWD	E	A	EZAK6Y	E	A	JN2L3T	C	A
CCWXAX	E	A	F3CZQV	E	A	JQQVDF	E	A
CXT9ZX	E	A	F49A67	E	A	JQRXV8		A
D4ZHZK	E	A	FKBM7F		A	JWW2Y8	E	A
D773P6	E	A	FPB8H8		A	JYMNLA	E	A
DA4Z3X	E	A	FTRMV6	E	A	K26MM6	E	A
DBEB7A		A	G2DMU9	E	A	K323UV	E	A
DBWRF4	E	A	G43EY6	E	A	K3Y3KZ		A
DEG8YP	E	A	GAUN94	E	A	KFNARW	E	A
DEUBDW	E	A	GFJLZU	E	A	KFPWXT	E	A
DFBVEY	E	B	GFYKT4	E	A	KJN4KC	E	A
DGMPY7	E	A	GQFAR9	E	A	KJNHZC		A
DPYNQW	E	A	GVTZ9W		A	KQMPAQ	E	A
DUV9VF	E	A	H2Y78Z	D	B	KUB3D3	E	A
DXVLFK	E	A	H387KU	E	A	KZCGWJ	E	A
E2MM3D	E	A	H4YTRB	E	A	L7GF6M	D	A
EKET7X	D	D	H78EP4	E	A	LECFKF	E	A
EKZ7WW	E	A	HCCA94		A	LJ3PUD	E	A
EM8JH4	E	A	HFE4BF	E	B	LLA8TA	E	A

TABLE 1 - Q1

WebCode	Q1		WebCode	Q1		WebCode	Q1	
	K1	K2		K1	K2		K1	K2
LP7ZHX	E	A	QDHZ3L	E	E	VA6793	E	A
LP9LDD	E	A	QFAQER	E	A	VFB6G8	E	A
LP9X7V	E	A	QNYAEY		A	VTXMGK	E	A
LUGLGB	E	A	QNZCH6	E	A	VX8DRY	D	A
M3BCVC	E	A	R877P2	E	A	W4TH97	E	A
M7BKYM	D	A	RBMVN6		A	W8ABWD	E	A
N47EY8	E	A	RDX2JY	E	A	WLTAW8		A
NHYJB4	E	A	RLVURT	E	A	WLWRWR	E	A
NK7Z6T	E	A	RU66YY		X	WNGCQE	E	A
NKPELW	E	A	RWQ3BV	D	A	WPK6Q	E	A
NLLNXL	E	A	RXJ34Z	E	A	WPW3TR		A
NQGDJZ	E	A	T4LCBT		A	WTENT7	E	B
NQVFL	E	A	T7AVZX	E	B	WVHGNQ	E	A
P2AFXD	D	A	TLADCQ	E	A	WWBP2V	E	A
PCQ6WJ	E	A	TPNBGR	E	A	XM23JZ	E	A
PQBHDY	E	A	TZJ3TJ	E	A	XNGL4W	D	A
PQCWNT		A	U8K6JH	E	A	XWTNMC	E	A
PUCZH2	E	A	UG8Y27	E	A	XYXB33	E	A
PV6GMN	E	A	UL2ZWT	E	A	Y2JCKV	C	A
PX9ALT	E	A	UNR23G	E	A	Y9G8JU	E	A
Q2MJGQ	E	A	UP3DWY	E	A	YATQJQ		A
Q3MAFY	E	A	UPJRY3		A	YB242R	E	A
QD4WPZ	E	A	UTNLB8	C	A	YG7YKR	E	A

TABLE 1 - Q1

WebCode	Q1		WebCode	Q1		WebCode	Q1	
	K1	K2		K1	K2		K1	K2
YHKXQH		A						
YWK6VR		A						
YYW6AU	E	A						
ZEL33U	E	A						
ZK9ZMB	E	A						
ZL4HMQ		A						
ZL6BHD	E	A						
ZPGTNF	E	A						
ZRPQR3	E	A						
ZTJE9C	C	A						
ZV9P2Q	E	A						
ZYLLQZ	E	A						
ZZFA7B	E	A						

Response Summary - Q1

Total Participants: 214

Based on the findings of your examination, could any of the photocopiers, as represented by the known exemplars, be used in the production of the questioned notes (Q1, Q2, Q3)?

Response	Q1		
	K1	K2	
A	0	204	<p>Response Key:</p> <p>A. The questioned note WAS MANUFACTURED by the known photocopier. B. The questioned note WAS PROBABLY MANUFACTURED by the known photocopier. C. CANNOT DETERMINE whether or not the questioned note was manufactured by the known photocopier. D. The questioned note WAS PROBABLY NOT MANUFACTURED by the known photocopier. E. The questioned note WAS NOT MANUFACTURED by the known photocopier.</p>
B	0	7	
C	5	0	
D	10	1	
E	170	1	

*Response totals may not equal total number of participants, as not all participants gave a response for both known items.

TABLE 1 - Q2

Q2			Q2			Q2		
WebCode	K1	K2	WebCode	K1	K2	WebCode	K1	K2
22AUHV	A	E	646L4P	A		9HV9TL	A	E
26ADTM	A	E	64NTLL	A	E	9ML3V9	A	E
27L6QB	A	D	6A9TG8	A	E	9Y3P69	A	E
2BY6M3	A	E	6G8DLN	A	E	A3W2K7	B	
2EVRGQ	A	E	6HQB3K	A	E	A6NM7M	A	E
2FQRMW	A	E	78JJAR	A		A93W47	A	E
2J8P3R	A	E	79B8EL	A	E	AATZT7	A	E
2K43PK	A		7BJPQH	A	E	APVJZ	A	E
2LF8EP	A		7P3BBC	A	E	AT8ZWL	A	E
2YZEXN	A	E	7V97UC	A	E	AW7CTL	A	E
34E68P	A	E	7VLBDM	A	E	AXKJE3	A	E
3AJHUA	A	E	87KGQL	A	E	B2WKHT	A	E
3DJCMP	A	E	8CBBT9	A	E	BB8L39	A	E
3K2UVQ	A	E	8LUAC4	A	E	BHKXWK	A	
3KX8JJ	A	E	8MQHQE	A	E	BLHGWX	A	E
3YXENV	A	E	8UBLVW	A	E	BMWDDG	A	E
43UVMM	A	E	8WWP4U	A	E	BVAUYH	A	
48PMVK	A	E	8YN29N	A		BXZJCP	A	D
4HAN3Z	A	E	8ZWL6G	A	C	BYU8RY	A	E
4PQYF2	A	E	9694LP	A	E	C4KB84	A	E
4QL34N	A	E	97YGFN	A		C7Q3QX	A	E
4TR6U8	A	E	9A26M4	A	E	C9VRWD	A	E
4XYQKP	A	E	9DZW2P	A	E	CCWXAX	A	E

TABLE 1 - Q2

WebCode	Q2		WebCode	Q2		WebCode	Q2	
	K1	K2		K1	K2		K1	K2
CXT9ZX	A	E	F49A67	A	E	JQRXV8	A	
D4ZHVK	A	E	FKBM7F	A		JWW2Y8	A	E
D773P6	A	E	FPB8H8	A		JYMNLA	A	E
DA4Z3X	A	E	FTRMV6	A	E	K26MM6	A	E
DBEB7A	A		G2DMU9	A	E	K323UV	A	E
DBWRF4	A	E	G43EY6	A	E	K3Y3KZ	A	
DEG8YP	A	E	GAUN94	A	E	KFNARW	A	E
DEUBDW	A	E	GFJLZU	A	E	KFPWXT	A	E
DFBVEY	B	E	GFYKT4	A	E	KJN4KC	A	E
DGMPY7	A	E	GQFAR9	A	E	KJNHZC	A	
DPYNQW	A	E	GVTZ9W	A		KQMPAQ	A	E
DUV9VF	A	E	H2Y78Z	A	E	KUB3D3	A	E
DXVLFK	A	E	H387KU	A	E	KZCGWJ	A	E
E2MM3D	A	E	H4YTRB	A	E	L7GF6M	A	D
EKET7X	A	E	H78EP4	B	E	LECFKF	A	E
EKZ7WW	A	E	HCCA94	A		LJ3PUD	A	E
EM8JH4	A	E	HFE4BF	B	E	LLA8TA	A	E
EMP3AA	B	E	HQWQKG	A	E	LP7ZHX	A	E
EWGC3D	A	E	HT2BA2	A	E	LP9LDD	A	E
EX3XEU	A	E	HYBJQ7	A	E	LP9X7V	A	E
EXP4ZF	A	E	JD37JY	A	E	LUGLGB	A	E
EZAK6Y	A	E	JN2L3T	A	C	M3BCVC	A	E
F3CZQV	A	E	JQQVDF	A	E	M7BKYM	A	D

TABLE 1 - Q2

Q2			Q2			Q2		
WebCode	K1	K2	WebCode	K1	K2	WebCode	K1	K2
N47EY8	A	E	RDX2JY	A	E	WLTAW8	A	
NHYJB4	A	E	RLVURT	A	E	WLWRWR	A	E
NK7Z6T	A	E	RU66YY	X		WNGCQE	A	E
NKPELW	A	E	RWQ3BV	A	D	WPK6Q	A	E
NLLNXL	A	E	RXJ34Z	A	E	WPW3TR	A	
NQGDJZ	A	E	T4LCBT	A		WTENT7	B	E
NQVFL	A	E	T7AVZX	B	E	WVHGNQ	A	E
P2AFXD	A	D	TLADCQ	A	E	WWBP2V	A	E
PCQ6WJ	A	E	TPNBGR	A	E	XM23JZ	A	E
PQBHDY	A	E	TZJ3TJ	A	E	XNGL4W	A	D
PQCWNT	A		U8K6JH	A	E	XWTNMC	A	E
PUCZH2	A	E	UG8Y27	A	E	XYXB33	A	E
PV6GMN	A	E	UL2ZWT	A	E	Y2JCKV	A	C
PX9ALT	A	E	UNR23G	A	E	Y9G8JU	A	E
Q2MJGQ	A	E	UP3DWY	A	E	YATQJQ	A	
Q3MAFY	A	E	UPJRY3	A		YB242R	A	E
QD4WPZ	A	E	UTNLB8	A	C	YG7YKR	A	E
QDHZ3L	A	E	VA6793	A	E	YHKXQH	A	
QFAQER	A	E	VFB6G8	A	E	YWK6VR	A	
QNYAEY	A		VTXMGK	A	E	YYW6AU	A	E
QNZCH6	A	E	VX8DRY	A	D	ZEL33U	A	E
R877P2	A	E	W4TH97	A	E	ZK9ZMB	A	E
RBMVN6	A		W8ABWD	A	E	ZL4HMQ	A	

TABLE 1 - Q2

WebCode	Q2		WebCode	Q2		WebCode	Q2	
	K1	K2		K1	K2		K1	K2
ZL6BHD	A	E						
ZPGTNF	A	E						
ZRPQR3	A	E						
ZTJE9C	A	C						
ZV9P2Q	A	E						
ZYLLQZ	A	E						
ZZFA7B	A	E						

Response Summary - Q2			Total Participants: 214
<i>Based on the findings of your examination, could any of the photocopiers, as represented by the known exemplars, be used in the production of the questioned notes (Q1, Q2, Q3)?</i>			
Response	Q2		
	K1	K2	
A	206	0	Response Key: A. The questioned note WAS MANUFACTURED by the known photocopier. B. The questioned note WAS PROBABLY MANUFACTURED by the known photocopier. C. CANNOT DETERMINE whether or not the questioned note was manufactured by the known photocopier. D. The questioned note WAS PROBABLY NOT MANUFACTURED by the known photocopier. E. The questioned note WAS NOT MANUFACTURED by the known photocopier.
B	7	0	
C	0	5	
D	0	8	
E	0	172	

*Response totals may not equal total number of participants, as not all participants gave a response for both known items.

TABLE 1 - Q3

Q3			Q3			Q3		
WebCode	K1	K2	WebCode	K1	K2	WebCode	K1	K2
22AUHV	E	A	646L4P		A	9HV9TL	E	A
26ADTM	E	A	64NTLL	E	A	9ML3V9	E	A
27L6QB	D	D	6A9TG8	E	E	9Y3P69	E	A
2BY6M3	E	A	6G8DLN	E	A	A3W2K7		B
2EVRGQ	E	A	6HQB3K	E	A	A6NM7M	E	A
2FQRMW	E	A	78JJAR		A	A93W47	E	A
2J8P3R	E	A	79B8EL	E	A	AATZT7	E	A
2K43PK		A	7BJPQH	E	A	APVJZ	E	A
2LF8EP		A	7P3BBC	E	A	AT8ZWL	E	A
2YZEXN	E	A	7V97UC	E	A	AW7CTL	E	A
34E68P	E	A	7VLBDM	E	A	AXKJE3	E	A
3AJHUA	E	A	87KGQL	E	E	B2WKHT	E	A
3DJCMP	E	A	8CBBT9	E	A	BB8L39	E	A
3K2UVQ	E	A	8LUAC4	E	A	BHKXWK		A
3KX8JJ	E	A	8MQHQE	E	A	BLHGWX	E	A
3YXENV	E	A	8UBLVW	E	A	BMWDDG	E	A
43UVMM	E	A	8WWP4U	E	A	BVAUYH		A
48PMVK	E	A	8YN29N		A	BXZJCP	D	A
4HAN3Z	E	A	8ZWL6G	C	A	BYU8RY	E	A
4PQYF2	E	A	9694LP	E	A	C4KB84	E	A
4QL34N	E	A	97YGFN		A	C7Q3QX	E	A
4TR6U8	E	A	9A26M4	E	A	C9VRWD	E	A
4XYQKP	E	A	9DZW2P	E	A	CCWXAX	E	A

TABLE 1 - Q3

Q3			Q3			Q3		
WebCode	K1	K2	WebCode	K1	K2	WebCode	K1	K2
CXT9ZX	E	A	F49A67	E	A	JQRXV8		A
D4ZHVK	E	A	FKBM7F		A	JWW2Y8	E	A
D773P6	E	A	FPB8H8		A	JYMNLA	E	A
DA4Z3X	E	A	FTRMV6	E	A	K26MM6	E	A
DBEB7A		A	G2DMU9	E	A	K323UV	E	A
DBWRF4	E	A	G43EY6	E	A	K3Y3KZ		A
DEG8YP	E	A	GAUN94	E	A	KFNARW	E	A
DEUBDW	E	A	GFJLZU	E	A	KFPWXT	E	A
DFBVEY	E	B	GFYKT4	E	A	KJN4KC	E	A
DGMPY7	E	A	GQFAR9	E	A	KJNHZC		A
DPYNQW	E	A	GVTZ9W		A	KQMPAQ	E	A
DUV9VF	E	A	H2Y78Z	D	B	KUB3D3	E	A
DXVLFK	E	A	H387KU	E	A	KZCGWJ	E	A
E2MM3D	E	A	H4YTRB	E	A	L7GF6M	D	A
EKET7X	E	A	H78EP4	E	A	LECFKF	E	A
EKZ7WW	E	A	HCCA94		A	LJ3PUD	E	A
EM8JH4	E	A	HFE4BF	E	B	LLA8TA	E	A
EMP3AA	E	B	HQWQKG	E	A	LP7ZHX	E	A
EWGC3D	E	A	HT2BA2	E	A	LP9LDD	E	A
EX3XEU	E	A	HYBJQ7	E	A	LP9X7V	E	A
EXP4ZF	E	A	JD37JY	E	A	LUGLGB	E	A
EZAK6Y	E	A	JN2L3T	C	A	M3BCVC	E	A
F3CZQV	E	A	JQQVDF	E	A	M7BKYM	D	A

TABLE 1 - Q3

Q3			Q3			Q3		
WebCode	K1	K2	WebCode	K1	K2	WebCode	K1	K2
N47EY8	E	A	RDX2JY	E	A	WLTAW8		A
NHYJB4	E	A	RLVURT	E	A	WLWRWR	E	A
NK7Z6T	E	A	RU66YY		X	WNGCQE	E	A
NKPELW	E	A	RWQ3BV	D	A	WPK6Q	E	A
NLLNXL	E	A	RXJ34Z	E	A	WPW3TR		A
NQGDJZ	E	A	T4LCBT		A	WTENT7	E	B
NQVFL	E	A	T7AVZX	E	B	WVHGNQ	E	A
P2AFXD	D	A	TLADCQ	E	A	WWBP2V	E	A
PCQ6WJ	E	A	TPNBGR	E	A	XM23JZ	E	A
PQBHDY	E	A	TZJ3TJ	E	A	XNGL4W	D	A
PQCWNT		A	U8K6JH	E	A	XWTNMC	E	A
PUCZH2	E	A	UG8Y27	E	A	XYXB33	E	A
PV6GMN	E	A	UL2ZWT	E	A	Y2JCKV	C	A
PX9ALT	E	A	UNR23G	E	A	Y9G8JU	E	A
Q2MJGQ	E	A	UP3DWY	E	A	YATQJQ		A
Q3MAFY	E	A	UPJRY3		A	YB242R	E	A
QD4WPZ	E	A	UTNLB8	C	A	YG7YKR	E	A
QDHZ3L	E	A	VA6793	E	A	YHKXQH		A
QFAQER	E	A	VFB6G8	E	A	YWK6VR		A
QNYAEY		A	VTXMGK	E	A	YYW6AU	E	A
QNZCH6	E	A	VX8DRY	D	A	ZEL33U	E	A
R877P2	E	A	W4TH97	E	A	ZK9ZMB	E	A
RBMVN6		A	W8ABWD	E	A	ZL4HMQ		A

TABLE 1 - Q3

WebCode	Q3		WebCode	Q3		WebCode	Q3	
	K1	K2		K1	K2		K1	K2
ZL6BHD	E	A						
ZPGTNF	E	A						
ZRPQR3	E	A						
ZTJE9C	C	A						
ZV9P2Q	E	A						
ZYLLQZ	E	A						
ZZFA7B	E	A						

Response Summary - Q3			Total Participants: 214
<i>Based on the findings of your examination, could any of the photocopiers, as represented by the known exemplars, be used in the production of the questioned notes (Q1, Q2, Q3)?</i>			
Response	Q3		
	K1	K2	
A	0	203	Response Key: A. The questioned note WAS MANUFACTURED by the known photocopier. B. The questioned note WAS PROBABLY MANUFACTURED by the known photocopier. C. CANNOT DETERMINE whether or not the questioned note was manufactured by the known photocopier. D. The questioned note WAS PROBABLY NOT MANUFACTURED by the known photocopier. E. The questioned note WAS NOT MANUFACTURED by the known photocopier.
B	0	7	
C	5	0	
D	9	1	
E	171	2	

*Response totals may not equal total number of participants, as not all participants gave a response for both known items.

Methods and Observations

What methods/techniques did you utilize? What observations were made from each method/technique?

TABLE 2

WebCode	Methods/Techniques	Observations
22AUHV	Video Spectral Comparator (VSC)	Flood Light - The marks on the black exemplars which also appears on the notes. Red/Green Mix - The are marks on the blank exemplars which appears on the same spots as on the notes.
26ADTM	Visual Examination	K2, Q1 and Q3 – toner, K1 and Q2 – ink. K2, Q1 and Q3 - same dirt/defects marks in printouts. K1 and Q2 - same dirt/defects marks in printouts.
	Microscopic Examination	K1 and Q2 - similar ink's dot composition;
	Oblique Light	K2, Q1 and Q3 - similar traces (Impressed lines)
	Examination of the magnetic properties of a toner (MagMouse 4097)	K2, Q1 and Q3 produced with a magnetic toner
	Overlays	K2, Q1 and Q3 - same dirt/defects marks in printouts. K1 and Q2 - same dirt/defects marks in printouts.
	Video Spectral Comparator (VSC)	UV, NIR: K2, Q1 and Q3 - same videospectral properties. K1 and Q2 - same videospectral properties.
27L6QB	Overlays	Acetate copies were made of each item to compare the orientation of the defects ("trash marks") present on the questioned notes and the known standards.
	Microscopic Examination	A stereo microscope was used to determine what type of printing process was used for each item. The submitted items were comprised of both toner and inkjet.
	ESDA	The ESDA was used to process each item. The questioned notes were processed to develop any indented writing or mechanical impressions possibly left during the copying process. The known items were also processed for possible mechanical impressions left during the copying process.
	Video Spectral Comparator (VSC)	Item #Q2 appeared to contain a section of toner with a possible CPS code. The VSC6000/HS was used to visualize the possible CPS code yellow dots. The VSC was also utilized to capture enlarged images of certain areas of the submitted items.
2BY6M3	Macroscopic Examination	The sample K1 was generated by an ink-jet printer and the sample K2 was generated by a monochrome Electrophotographic (laser) printer. No bitmap code was seen in either specimen. The questioned document Q2 was generated by an ink-jet printer while the questioned documents Q1 and Q3 were generated by a monochrome Electrophotographic printer.
	Indented Writing	An ESDA was used to bring up any roller marks on the documents. The specimen K2 showed a clear roller mark on the rear of the page. The questioned documents, Q1 and Q3 had a matching roller mark on the rear of the page.
	Overlays	All documents examined had numerous trash marks on them. The pattern of trash marks on the questioned documents Q1 and Q3 matched those on the specimen K2. The pattern of the trash marks on the questioned document Q2 matched those on the specimen K1.

TABLE 2

WebCode	Methods/Techniques	Observations
2EVRGQ	Visual Examination	Q1-Q3 were each found to comprise of a sheet of plain white paper, each bearing a copy of printed material cut out from a newspaper or magazine on one side. K1 and K2 were each found to comprise of three sheets of plain white paper.
	Microscopic Examination	Q1-Q3 were each found to have a number of 'trash' marks present. K1 and K2 were each found to have a number of 'trash' marks present.
	Overlays	The size, shape and orientation of the 'trash' marks on Q1 and Q3 were found to match each other and differ from that on Q2. The size, shape and orientation of the 'trash' marks on Q1 and Q3 were found to match that on K2 and differ from that on K1. The size, shape and orientation of the 'trash' marks on Q2 was found to match that on K1 and differ from that on K2.
	Printing Technique	Q1 and Q3 were produced using a dry toner process. Q2 was produced using inkjet printing. K1 was produced using inkjet printing. K2 was produced using a dry toner process.
2FQRMW	Microscopic Examination	2.1.1 Trash marks were identified on all questioned threatening notes copies and specimen blank copies. 2.1.2 Trash marks identified on questioned threatening notes copies marked "Q1" and "Q3" match with the trash marks identified on specimen blank copies marked "K2". 2.1.3 Trash marks identified on questioned threatening notes copies marked "Q2" match with the trash marks identified on specimen blank copies marked "K1".
	Visual Examination	2.2.1 Trash marks were identified on all questioned threatening notes copies and specimen blank copies. 2.2.2 Trash marks identified on questioned threatening notes copies marked "Q1" and "Q3" match with the trash marks identified on specimen blank copies marked "K2". 2.2.3 Trash marks identified on questioned threatening notes copies marked "Q2" match with the trash marks identified on specimen blank copies marked "K1".
2J8P3R	Visual Examination	1). K1 and Q2 had significant similar trash marks throughout their pages and these were significantly different to those in K2, Q1 and Q3. 2). K2, Q1 and Q3 had significant similar trash marks throughout their pages and these were significantly different to those in K1 and Q2.
	Transmitted Light	1). The trash marks on K1 and Q2 significantly matched when they were superimposed. 2). The trash marks on K2, Q1 and Q3 significantly matched when they were superimposed.
	Oblique Light	1).No indented impressions found on K1 and Q2. 2).Three indented lines which appeared to be fragmented were observed on K2. Two of them were more indented and could be more clearly seen as compared to the other one. 3). Two indented lines which appeared to be fragmented was observed on Q1 and Q3. 4). Comparing the three indented lines observed on K2 with the two indented lines found on Q1 and Q3, respectively, showed that two of the three indented lines on K2 were significantly similar with those two found on Q1 and Q3.
2K43PK	Visual Examination	We match the toner traces between the question document and (K) papers under different techniques.
	Transmitted Light	
	Ultraviolet Light	
	Microscopic Examination	

TABLE 2

WebCode	Methods/Techniques	Observations
2LF8EP	Video Spectral Comparator (VSC)	FLOOD LIGHT FOR EXAMINATION OF DEFECTS AND PATTERNS
	Video Spectral Comparator (VSC)	FLOOD LIGHT FOR EXAMINATION OF MARKS AND DIRT
2YZEXN	Overlays	The trashmarks on Exhibits Q1 and Q3 aligned with the trashmarks on the known samples (K2). The trashmarks on Exhibit Q2 aligned with the trashmarks on the known samples (K1).
	Visual Examination	Exhibit Q2 had horizontal non-printing lines through the dark areas. Exhibits Q1 and Q3 did not have horizontal non-printing lines through the dark areas.
	Oblique Light	The back sides of Exhibits Q1, Q3, and K2 had two raised lines horizontally across the page.
	ESDA	Indentation examination of both sides of Exhibits Q1 through Q3, K1, and K2 revealed similar horizontal banding patterns on Q1, Q3, and K2. No such banding pattern was visible on Q2 and K1.
34E68P	Visual Examination	1.The trash mark configuration of Q1 and Q3 is consistent with K2. 2.The trash mark configuration of Q2 is consistent with K1.
	Microscopic Examination	Q1, Q3, k2 are laser printed, and Q2, k1 are inkjet printed.
	Oblique Light	1.The Indentations on Q1 and Q3 are consistent with K2. 2.There is no obvious indentation on both Q2 and K1.
3AJHUA	Visual Examination	Examine and comparing the paper and dots of a blank exemplars to those dots identified on the questioned notes
	Video Spectral Comparator (VSC)	(Including broad-band illumination for general inspection, narrow-band illumination for exciting fluorescence and broad-band side and transmitted lighting)
	Microscopic Examination	For low magnification observation using incident light illumination
	Ultraviolet Light	Monochromatic illumination for exciting fluorescence
3DJCMP	ESDA	No indented impressions of handwriting were observed on the questioned notes "Q1", "Q2" and "Q3".
	Macroscopic/Microscopic Examination	Trash marks were seen on the questioned notes "Q1", "Q2", "Q3" and the three known exemplars of "K1" and "K2" respectively.
	Comparison technique	(i) Similar and consistent trash marks appear and present at the same position between the questioned notes "Q1" and "Q3" with the known exemplars of "K2". (ii) Similar and consistent trash marks appear and present at the same position between the questioned note "Q2" with the known exemplars of "K1".
	Comarison technique	(i) Dissimilar and inconsistent trash marks appear and present at different position between the questioned notes "Q1" and "Q3" with the known exemplars of "K1". (ii) Dissimilar and inconsistent trash marks appear and present at different position between the questioned note "Q2" with the known exemplars of "K2".
3K2UVQ	Visual Examination	Visual check on paper colour and size.
	Video Spectral Comparator (VSC)	Under UV and fluorescent lighting conditions no differences were detected.

TABLE 2

WebCode	Methods/Techniques	Observations
3KX8JJ	Visual Examination	Utilizing a visual comparison of Q1, Q2, and Q3, to K1 and K2, I was able to determine that the trash marks on: 1) Q1 matched the trashmarks on K2. 2) Q2 matched the trashmarks on K1. 3) Q3 matched the trashmarks on K2.
3YXENV	Video Spectral Comparator (VSC)	FOR THE EXAMINATION OF DEFECTS AND PATTERNS
	Video Spectral Comparator (VSC)	FOR THE EXAMINATION OF MARKS AND DIRT
43UVMM	Visual Examination	Q1 and Q3 bore trash marks which were similar to those on K2 in terms of their relative positions and general appearance (shape & size). Q2 bore trash marks which were similar to those on K1 in terms of their relative positions and general appearance (shape and size).
	Macroscopic examination on light box	Q1 and Q3 bore trash marks which were similar to those on K2 in terms of their relative positions and general appearance (shape & size). Q2 bore trash marks which were similar to those on K1 in terms of their relative positions and general appearance (shape and size).
	Microscopic Examination	The printed contents on Q1, Q3 and K2 were found to bear characteristics of black toner printing. The printed contents on Q2 and K1 were found to bear characteristics of colour inkjet printing .
48PMVK	Visual Examination	On all investigated documents (Q1, Q2, Q3) and comparative documents (K1, K2) are visible individual characteristics (marks, dots and impurities). Individual characteristics on item Q1 and Q3 are on the same position and have the same shape. They are also on the same position and have the same shape as on comparative documents K2. Individual characteristics on item Q2 are on the same position and have the same shape as on comparative documents K1.
	Microscopic Examination	Questioned items Q1 and Q3 are printed with laser printer (toner). Item Q2 is printed with colour ink jet printer. The comparative items K1 are printed with colour ink jet printer. Items K2 are printed with laser printer (toner).
	Video Spectral Comparator (VSC)	Oblique light - on items Q1, Q3 and K2 are visible two horizontal indented lines which are approximately on the same place. On items Q2 and K1 there are no indented lines. Overlapping - Comparison of individual characteristics (marks, dots and impurities) on items Q1, Q3 and K2 showed that all characteristics are on the same position and have the same shape. UV light - no differences between questioned and comparative documents.
	ESDA	No result
4HAN3Z	Video Spectral Comparator (VSC)	To superimpose the disputed with the specimen
	Trasparencies	To superimpose the disputed with specimen. Also to conduct a side by side comparison
	Macroscopic/Microscopic Examination	To enlarge markings on the disputed and specimens
4PQYF2	Video Spectral Comparator (VSC)	Light source: Flood light. The dots (marks) on "K2" and "Q1" and "Q3" were superimposed, the dots (marks) match. The dots (marks) appear on the same positions and same patterns.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	Light source: Flood light. The dots (marks) on "K1" and "Q2" were superimposed, the dots (marks) match. The dots (marks) appear on the same positions and same patterns.
4QL34N	Macroscopic/Microscopic Examination	Q1, Q3, and K2 were produced by a black electrophotographic process. Q2 and K1 were produced by an color inkjet process. No CPS codes were observed on any item.
	Oblique Light	Comparable transport roller marks were observed on Q1, Q3, and K2. Buckling/puckering was observed on Q2 surrounding printed portions. K1 showed no significant features.
	Overlays	Photoshop was used to overlay scans of the Q and K items. In position and morphology, the trash marks on Q1 and Q3 superimposed those on K2, and the trash marks on Q2 superimposed those on K1. The trash marks on K1 and K2 did not superimpose in either position or morphology.
	ESDA	Comparable transport roller marks were observed on Q1, Q3, and K2. No other features were observed.
	Thickness	No significant differences were observed.
	X-Ray	Radiographs showed iron-based magnetic toner on Q1, Q3, and K2. No magnetic toner was detected on Q2 or K1.
	Ultraviolet Light	Fluorescent fibers were present on all items. No significant differences were observed.
4TR6U8	Microscopic Examination	After an examination and comparison, the following observations were made: 1 Pertaining to the documents marked as "Q1" and "Q3": 1.1 The trash marks visible on the documents are printed by means of a laser printer. 1.2 The trash marks of both documents are near identical regarding placement and shape. 2 Pertaining to the documents marked as "Q2": 2.2 The trash marks visible on the document is printed by means of an ink-jet printer. 2.3 The trash marks visible on the document marked as "Q2" differs to the trash marks visible on the documents marked as "Q1" and "Q3" regarding placement and shape. 3 Pertaining to the exemplars marked as "1/K1", "2/K1" and "3/K1": 3.1 The trash marks visible on the exemplars are printed by means of an ink-jet printer. 3.2 The trash marks visible are near identical regarding placement and shape to the trash marks visible on the exemplar marked as "Q2". 4 Pertaining to the exemplars marked as "1/K2", "2/K2" and "3/K2": 4.1 The trash marks visible on the exemplars are printed by means of a laser printer. 4.2 The trash marks visible are near identical regarding placement and shape to the trash marks visible on the exemplars marked as "Q1" and "Q3".
4XYQKP	Visual Examination	To appreciate the general characteristics that each documents presents.
	Magnification	To observe the configuration of each of the printing particularities in a precise manner and evaluate the type of printing system that is used in each document.
	Video Spectral Comparator (VSC)	To appreciate the particularities of each of the documents using different types of lighting such as: white lighting and the transmitted lighting in order to compare the printing particularities and its location in each of the documents when overlay the questioned documents above the base documents for comparison.
646L4P	Macroscopic/Microscopic Examination	to identify printing characteristics, as well as the morphologies and arrangement of the points (printing defects).

TABLE 2

WebCode	Methods/Techniques	Observations
	Overlays	to check the location identical location of the points (particularities) printed on the substrate.
	Video Spectral Comparator (VSC)	it was the equipment with which the analysis is carried out
64NTLL	Macroscopic/Microscopic Examination	Microscopic - To determine method of production (including VSC). Macroscopic - To compare patterns of 'trash marks' between Known & Questioned
	Overlays	To compare relative positions of 'trash marks' between Known and Questioned
6A9TG8	Microscopic Examination	Microscopy (for low magnification observation using incident light illumination)
	Infrared Light	Visible and infrared reflected lighting (including broad band illumination for general inspection narrow band illumination for exciting fluorescence and broad side lighting.
	Ultraviolet Light	Reflected ultraviolet (UV) lighting (monochromatic illumination for exciting fluorescence.
6G8DLN	Microscopic Examination	Printing Processes
	Macroscopic Examination	Initial Assessment
	ESDA	Indented Writing Exam
	Overlays	Correspondence in Trashmarks
	Video Spectral Comparator (VSC)	Indented writing Exam
6HQK3K	Microscopic/Macroscopic Comparison	Similar trash marks were observed between Exhibit Q2 and Exhibit K1. Similar trash marks were observed between Exhibits Q1 and Q3 with Exhibit K2
	Ink Examination - Ultraviolet	No differences were observed in fluorescence between Exhibits Q1-Q2 with Exhibits K1-K2.
	Indented writing - Electrostatic/Oblique Examination	No indentations were observed on Exhibits Q1-Q3 and Exhibits K1-K2.
78JJAR	Visual Examination	The documents Q1, Q2 and Q3 are observed directly with the magnifying glass, as are the K1 and K2 patterns They are compared visually by superimposing the doubt sheets against the pattern prints facing the documents, to see if they present the same marks left by each of the known photocopiers.
	Transmitted Light	Incidence of transmitted light of documents Q1, Q2 and Q3, each on the printed sheets K1, and K2 to find if it matches the record or mark left by the photocopier and this is presented or not on the doubt sheets.
79B8EL	Magnification	Hand magnifier (5x) was used to perform a cursory exam on the questioned notes to determine the method of production. Q1 & Q3 were produced on a system using black toner. Q2 was produced using inkjet technology.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	Stereomicroscope (5x-63x) was used to determine the method of production of the questioned notes and to observe the morphology of the trash marks. Q1 & Q3 were produced on a system using black toner. Q2 was produced using inkjet technology. The trash marks on the documents had individual morphology.
	Overlays	Transparency film - overlays were made of the constellation of trash marks on the known exemplars. The overlays were compared to the trash marks on the questioned notes. The trash marks on K1 matched Q2. The trash marks on K2 matched Q1 & Q3.
	Video Spectral Comparator (VSC)	VSC 6000 (visible, magnification, UV & side lighting) was used to document the printing processes and the morphology of the trash marks, to check the fluorescence of the paper, and to observe any possible transportation/paper handling marks. The fluorescence on all the sheets of paper was the same. The same transportation marks were observed on both the K2 exemplars and Q1 and Q3.
	ESDA	The electrostatic detection device was used to develop any possible impressions placed on the documents from the transportation/paper handling mechanism. No impressions from the transportation marks were developed.
7BJPQH	Magnification	Marks which were similar in shape, size and position were found on the specimen and disputed documents
	Overlays	The marks found on the document marked "K1" and document marked "Q2" are similar in shape, size and position. The marks found on the document marked "K2" and documents marked "Q1" and "Q3" is similar in shape, size and position.
	Visual Examination	
7P3BBC	Macroscopic/Microscopic Examination	Printing process determination: Items 1, 3, and 5 = toner printing process. Items 2 and 4 = inkjet printing process. Trash mark exams/comparison: Same printing process for Items 1, 3, and 5 – comparison of trash marks – agreement in size, location, and morphology. Same printing process for Items 2 and 4 – comparison of trash marks – agreement in size, location, and morphology
	Overlays	Trash mark exams/comparison: Items 1, 3, & 5 agreement. Items 2 & 4 agreement
	Oblique Light	Horizontal indentations on Items 1, 3, and 5
	ESDA	Horizontal roller marks on Items 1, 3, and 5; vertical roller marks on Items 3 and 5. Vertical roller marks on Items 2 and 4; no visible horizontal roller marks
	Transmitted Light	Watermark negative all items
7V97UC	Transmitted Light	Checked for presence of watermark. None visualized.
	Microscopic Examination	Observed printing processes (toner on Q1, Q3, and K2 and inkjet on Q2 and K1) and trashmarks on all specimens.
	Oblique Light	Observed printer indentation marks on Q1, Q3, and K2.
	ESDA	Observed and lifted printer indentation marks on Q1, Q3, and K2.

TABLE 2

WebCode	Methods/Techniques	Observations
	Overlays	Trashmark analysis and association between Q1, Q3, and K2 and Q2 and K1.
7VLBDM	Macroscopic Examination	Examined the document to determine overall general features and characteristics. Both K1 and K2 documents bore many trash marks, appearing to be from debris on the photocopier. The Q1, Q2, and Q3 documents all bore trashmarks similar to either the ones on K1 or K2.
	Macroscopic/Microscopic Examination	Examined document with stereomicroscope to observe characteristics of photocopied areas. Observed that K1 was produced with a 4-color inkjet process (black, cyan, magenta, and yellow). Observed that K2 was produced with a black toner process. Observed that Q2 was produced with a 4 color inkjet process and Q1 and Q3 were produced with a black toner process.
	Transmitted Light	Examined documents with transmitted light, and overlays to compare the placement of the trash marks between the Q and K documents.
	Overlays	Overlaid the Q and K documents utilizing transmitted light to compare placement of the trash marks. They were similar where noted between the Q and K, in overall size, appearance, and relative placement on the paper.
87KGQL	Macroscopic Examination For transparency	
8CBBT9	Video Spectral Comparator (VSC)	Light source: Flood light. The physical characteristics (markers) of K1 matches the physical characteristics (markers) of Q2. The markers "K1" were superimposed with Markers "Q2" and they match. The markers on K1 and Q2- same patterns and positions.
	Video Spectral Comparator (VSC)	Light source: Flood light. The physical characteristics (markers) of K2 matches the physical characteristics (markers) of Q1 and Q3. The markers "K2" were superimposed with markers "Q1" & "Q3" and they match. The markers on K2 and Q1, Q3- same patterns and positions.
8LUAC4	Video Spectral Comparator (VSC) Overlays	The VSC were used to do superimposition of the trash marks on the Questioned and Sample Items, and were found to be of common origin. Transparencies were made from the Sample items and were superimposed on the Questioned Items and it was found that the trash marks on both sets of documents correspond.
8MQHQE	Visual Examination	Residue/contamination on all examined papers (K1, K2, Q1, Q2, Q3), originating from the used output device.
	Macroscopic/Microscopic Examination	Printing Process: Ink based printing on Sample K1 and Questioned Document Q2, Non-magnetic toner on Sample K2 and Questioned Document Q1 and Q3.
	Examination in extravisual range	No evidence found (UV, IR absorption, IR luminescence). Papers can not be distinguished from each other.
	ESDA	No evidence found.
	Overlays	Complete coverage of the residue/ contamination between Sample K1 and Questioned Document Q2. Complete coverage of the residue/ contamination between Sample K2 and Questioned Document Q1 and Q3.

TABLE 2

WebCode	Methods/Techniques	Observations
8UBLWW	Visual Examination	Q-1 through Q-3, were examined visually for photographic identification markings.
	Video Spectral Comparator (VSC)	Q-1 through Q-3, were examined utilizing the VSC 6000/HS, using different types of lighting (ultraviolet, infrared and different bands of lights) to secured any marking presented by the copier.
8WWP4U	Visual Examination	Overlay using transmitted light: Congruent position and shape of artifacts copied by the copier caused by specks of dirt or other contaminants on the scanner glass of Q1, Q3 and K2 and divergent to Q2 and K1. Q2 and K1 show the same position and shape of artifacts.
	Microscopic Examination	Q1, Q3 and K2 were produced by a Laser Copier. Q2 and K1 were produced by an Inkjet Copier. The ink drop size is identical on anonymous note Q2 and samples K1. Shapes of copied artifacts are identical on Q1, Q3 and K2 but differ from Q2 and K1. On the other side copied artifacts are identical on Q2 and K1.
	Internet search	K1, Kodak ESP Office 2170 is an All-in-One Inkjet Printer. K2, Canon Image Runner 3225 is a B/W Laser Printer
8YN29N	Visual Examination	which allows us to identify the shape and location of the toner particles
	Video Spectral Comparator (VSC)	which allows overlapping of documents much doubt as pattern
	Macroscopic/Microscopic Examination	allows us to specify the form of the particular of the toner for his subsequent confrontation
8ZWL6G	Microscopic Examination	To determine method of production
	Comparison	To match defect marks
9694LP	Video Spectral Comparator (VSC)	Full identification of the production characteristics of the target sample "K1" with questioned note "Q2" is achieved, the note must be inverted to observe the equivalent qualities such as: the analogous forms, sizes, hue and specific location of each vestige, for example, the figure exclusive in the shape of 1 located 3.7 cm from the left edge and 7.6 cm from the top edge, the horizontal figure in the shape of a harpoon located in the central part of the leaves, among others.
	Video Spectral Comparator (VSC)	Through the use of lights, magnifications and superimpose action, it is established that the printing characteristics of the sample sheet "k2" are related with those exhibited in the questioned notes Q1 and Q3 (note Q3 must be inverted to identify them). The equivalent findings correspond to the shape, tone, shade, and location of the upper central area; cloud of dark points of inclined position, located at 8.8 cm left side and 5.8 cm from the upper edge of the leaves, among others.
	Macroscopic/Microscopic Examination	Verification of the shapes, sizes and tone of the printing characteristics of the example blanks K1 and K2 concerning to those exhibited in the questioned notes Q1, Q2 and Q3 with the results described above.
97YGFN	Visual Examination	To identify if the questioned documents present the same impression system

TABLE 2

WebCode	Methods/Techniques	Observations
	Macroscopic Examination	By means of the comparison by superposition the documents for analysis Q1, Q2, Q3 were taken to identify if the three had been printed by the same printer, for this the printing characteristics left in the doubt documents were taken into account, such as the location and the shape of the black dots and some lines. What determined that two of the documents Q1 and Q3 of doubt had been printed by the same printer, while the third Q2 had been printed in another.
	Overlays	Once the documents printed by the two printers have been identified, the comparison and overlap of the doubted documents is compared to the undisclosed documents K1 and K2, finding that Q1 and Q3 coincide with particularities that are associated such as the location, size, shape and arrangement in each and every one of the printing characteristics with the reference printers K2, likewise, the analysis of the doubt document Q2 shows the same printing characteristics that are evidenced in the undoubted document K1. The Q1 and Q3 doubt documents were prepared by the K2 printer (known photocopier was used in the production of the anonymous note). The Q2 doubt documents come from the K1 printer source or (known photocopier was used in the production of the anonymous note)
9A26M4	Video Spectral Comparator (VSC)	The printed contents in Q1 and Q3, and the trash marks on K2a-c were made up of black toner particles, while the printed contents in Q2 and the trash marks on K1a-c were made up of coloured ink droplets.
	Macroscopic/Microscopic Examination	Common pattern of trash marks were found in items Q1 and Q3, and the known exemplars in items K2a-c; the respective trash marks were found to be agreed in size, shape and relative positions. The relative positions of trash marks on Q3 were in a 180 degree opposite orientation from Q1 and K2a-c. On the other hand, common pattern of trash marks were found in item Q2 and the known exemplars in items K1a-c; the respective trash marks were found to agree in size, shape and relative positions.
	ESDA	No significant findings
	Oblique Light	Common indented roller marks were found between items Q1 and Q3, and the known exemplars in items K2a-c, while no such roller mark was found in items Q2 and K1a-c.
9DZW2P	Video Spectral Comparator (VSC)	Light source: Flood light. The blank exemplars marked "K1" superimposed with note marked "Q2" and the dots (marks) match. The dots (marks) are on the same position and pattern.
	Video Spectral Comparator (VSC)	Light source: Flood light. The blank exemplars marked "K2" superimposed with notes marked "Q1" and "Q3" and the dots (marks) match. The dots (marks) are on the same position and pattern.
9HV9TL	Microscopic	Toner - Q1 and Q3, K2-1 thru K2-3. Inkjet - Q2, K1-1 thru K1-3
	Instrumental Analysis - Video Spectral Comparator	Printer defects - all exhibits
	Indented writing - electrostatic	Roller marks - Q1 and Q3, K2-1 thru K2-3
9ML3V9	Video Spectral Comparator (VSC)	THE KNOWN PHOTOCOPIER "K1" WAS USED IN THE PRODUCTION OF THE QUESTIONED NOTE "Q2". "K1" AND "Q2" ARE SUPERIMPOSED AND MARKINGS MATCH. THE MARKINGS ARE OF THE SAME PATTERN AND SAME POSITIONS.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	THE KNOWN PHOTOCOPIER "K2" WAS USED IN THE PRODUCTION OF THE QUESTIONED NOTES "Q1" AND "Q3". "K2" AND "Q1" AND "Q3" ARE SUPERIMPOSED AND MARKINGS MATCH. THE MARKINGS ARE OF THE SAME PATTERN AND SAME POSITIONS.
9Y3P69	Video Spectral Comparator (VSC)	Flood light- "Q2" was superimposed on "K1", wherein the background markings of both the papers are identical: they have the same pattern and shape respectively and are placed at the exact position.
	Video Spectral Comparator (VSC)	Flood light- "Q1" was superimposed on "K2", wherein the background markings of both the papers are identical: they have the same pattern and shape respectively and are placed at the exact position.
	Video Spectral Comparator (VSC)	Flood light- "Q3" was superimposed on "K2", wherein the background markings of both the papers are identical: they have the same pattern and shape respectively and are placed at the exact position.
A3W2K7	Visual Examination	I first conducted a visual overview of the blank paper from the copier, taking notes w/regard to the trash marks, i.e. how many there were and where they showed up. It became evident, that for Q1, The trash marks scattered throughout the white background of the anonymous note are consistent with the trash marks found on the papers produced by the copier found in the school library identified as K2, a Canon Image Runner 3225. Noting the CTS label placement affixed to the reverse of the top of pages, Q1 must be rotated 180° for the trash marks to align. For Q2 The trash marks are consistent with the trash marks found on the papers produced by the copier in the yearbook classroom, identified as K2, a Kodak ESP Office 2170. For Q3 the trash marks are consistent with the trash marks found on the papers produced by the copier in the yearbook classroom, identified as 2, a Kodak ESP Office 2170. Noting the CTS label placement on the reverse of the top of pages, this note must be rotated 180° for the trash marks to align.
	Microscopic Examination	Revealed soft edges on the type fonts found in the note identified as Q2. Additionally, blank streaks were found running horizontally through the letterforms. Traces of a green tint could be found in some of the streaks. This type of streaking can be found if a nozzle is clogged in an ink jet printer, not allowing the ink to strike the paper. This printing flaw is consistent with flaws that can be found in a color ink jet printer, and K2 is a color inkjet printer. (It should be noted that other printers can also show white streaks when they are running out of ink. In this instance, the ink coverage appeared robust from top to bottom of the note, and the white streaks were more indicative of a clogged jet nozzle. Rather than simply compare the anonymous note to blank paper from the copier, it might be helpful to compare a page of writing and/or images printed on the Kodak ESP Office 2170 to see if those streaks surface in comparative images. Results could vary depending on when the ink was last changed and/or the machine cleaned. On line reviews of the Kodak printer recorded dozens of unhappy customers complaining about the poor quality of the printer head in this machine. Further microscopic examination revealed crisp sharp edges on the type found in anonymous notes Q1 and Q3, consistent with printing executed on a laser printer. According to what I could find, the Canon Image Runner 3225 is a laser printer.
	Transmitted Light	Blank pages from both copiers were placed on a light table and the anonymous notes were placed over them to see if the trash marks would align, and they did, as described in the Visual Examination section.

TABLE 2

WebCode	Methods/Techniques	Observations
A6NM7M	Microscopic Examination	K1 and Q2 - four color process. K2, Q1,Q3 - monotone black
	ESDA	No indentations found on Q1 to Q3
	Video Spectral Comparator (VSC)	Small fluorescent streak on Q2. Q1 to Q3 printed on paper that contains recycled fiber.
	Overlays	Trash marks from K1 and Q2 are the same. Trash marks from K2, Q1,Q3 are the same.
A93W47	Microscopic Examination	Mounded, melted toner particles were observed on Items 1 (Q1), 3 (Q3), and 5 (K2), consistent with a black toner printing process. Droplets of ink and evidence of clogged inkjet portals were observed on Items 2 (Q2) and 4 (K1), consistent with a color inkjet printing process. Trash marks observed on Items 1 through 5 (Q1 through Q3, K1, and K2, respectively)
	ESDA	Horizontal roller mark impressions observed on Items 1 (Q1), 3 (Q3) and 5 (K2) (very faint horizontal impressions observed as well-possibly from other machines); Vertical roller impression observed on Items 2 (Q2) and 4 (K1); No IW observed on Items 1 through 5 (Q1 through Q3, K1, and K2, respectively)
	Video Spectral Comparator (VSC)	Transmitted light: No Watermarks on Items 1 through 5 (Q1 through Q3, K1, and K2, respectively)
	Overlays	Trashmark alignment observed on Items 1 (Q1) and 3 (Q3), with 5 (K2). Trashmark alignment observed on Item 2 (Q2) with 4 (K1)
	Indented Writing	Side-light: Horizontal roller mark impressions observed on Items 1 (Q1), 3 (Q3) and 5 (K2) (very faint horizontal impressions observed as well-possibly from other machines); Vertical roller impression observed on Items 2 (Q2) and 4 (K1); No IW observed on Items 1 through 5 (Q1 through Q3, K1, and K2, respectively)
AATZT7	Transparencies and photocopy machine	Photocopies of the blank examplers and the questioned notes on tranaparencies for physical match.The defects on K1 and Q2 are similar. The defects on K2, Q1 and Q3 are similar.
	Video Spectral Comparator (VSC)	Magnification and flood light to examine physical match. The defects on K1 and Q2 are similar. The defects on K2, Q1 and Q3 are similar.
APVJZ	Oblique Light	Roller marks with side lighting on Q1 and Q3.
	ESDA	No writing impressions observed on Q1-Q3
	Microscopic Examination	Examined Q1-Q3 to observe printing processes used.
AT8ZWL	Visual Examination	Overview of the samples: defects (dots and other shapes) observed on all samples.
	Oblique Light	Similar indented impressions on samples Q1, Q3 and K2, likely originating from the paper handling mechanism of the device the samples have been printed with.
	ESDA	No significant observations.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	Q1: produced with toner based equipment (electrophotography). Q2: produced with ink jet based equipment. Q3: produced with toner based equipment (electrophotography). K1: produced with ink jet based equipment. K2: produced with toner based equipment (electrophotography). No significant differences in the appearance of the toner between Q1, Q3 and K2. No significant differences in the appearance of the ink jet printing between Q2 and K1.
	Video Spectral Comparator (VSC)	Q1 and Q3 were superimposed with K2 and compared to K2: Q1-K2: More than 20 similar defects (dots and defects of various shapes) in similar positions on samples Q1 and K2 (all three provided K2 sheets). Q3-K2: More than 20 similar defects (dots and defects of various shapes) in similar positions on samples Q3 and K2 (all three provided K2 sheets). Q2 was superimposed with K1 and compared to K1 in order to find similarities: More than 14 similar defects (dots and defects of various shapes) in similar positions on samples Q2 and K1 (all three provided K1 sheets).
	FTIR	Q1, Q3 and K2 were analysed. No significant differences between them were observed.
AW7CTL	Microscopic Examination	Items K1 and Q2 are ink jet technology (CMYK). Items K2, Q1, and Q3 are toner technology (black). Trash marks were observed on the questioned and known documents.
	Video Spectral Comparator (VSC)	Image enhancement utilized to observe Trash marks in agreement between Items Q1, Q3, and K2. Trash marks are in agreement between Items Q2 and K1. Side lighting examination revealed similar visible impressions on Items Q1, Q3, and K2.
	ESDA	Paper transport mechanism impressions developed on the questioned and known documents. Class characteristics of subtle paper transport mechanism impressions on Items K1 and Q2 are in agreement. Class characteristics of paper transport mechanism impressions on Items K2, Q1, and Q3 are in agreement.
AXKJE3	Visual Examination	Q1, Q3 and K2 show the same constellation of characteristics marks. The constellation of characteristics marks found leads to the conclusion that these features comes from the glass platen of the copying machine used (scratches or soiling on the glass). The reason for this statement is that the features found are located at the same relative coordinate points on Q1, Q3 and the three K2 copies. Q2 and K1 show the same constellation of characteristics marks. The constellation of characteristics marks found leads to the conclusion that these features comes from the glass platen of the copying machine used (scratches or soiling on the glass). The reason for this statement is that the features found are located at the same relative coordinate points on Q2 and the three K1 copies.
	ESDA	Q2 and K1 show the same latent indentations left by the printing mechanism.
	Microscopic Examination	The questioned notes Q1 & Q3 and the test copies K2 were each produced on a copying machine working on the indirect electro photographic system using a dry toner and heat/pressure fixing. The questioned note Q2 and the test copies K1 were each produced on an inkjet printing color system using dyes (cyan, magenta and yellow) and pigment (black) inks.
	Regula Model 4197	Q1, Q3 and K2 use a dry magnetic toner.

TABLE 2

WebCode	Methods/Techniques	Observations
	ATR-FTIR spectroscopy	The toner material from the questioned notes Q1 & Q3 could not distinguished from the toner material of the K2 samples.
	Raman spectroscopy	The cyan (C), magenta (M) and yellow (Y) inks from the questioned notes Q2 could not distinguished from the CMY inks material of the K1 samples.
B2WKHT	Projectina Docucenter Nervis	Projectina is used to examen the documents enlarge the markes with different light sources and take photo's of the markes on the paper to prove that it occurs on the same place on different documents
	Microscopic Examination	These examination was used to enlarge the idetified markes on the paper to show the shape and size of the markes respectively are the same.
	Overlays	A physical match was done to demonstrate that "K1" fit on "Q2" and "K2" fit on "Q1" and "Q3".
BB8L39	Microscopic Examination	Magnification and flood light in order to visually examine and compare any visible defects in respect of size, location and form.
	TRASPARENCIES	Transparencies were utilised to illustrate the physical match between of the defects.
BHKXWK	Visual Examination	to verify the coincidences between the documents of study
	Transmitted Light	to make a comparative analysis with overlay of the documents
	Video Spectral Comparator (VSC)	with this instrument show the same characteristics presents in the questioned documents and the sample documents
BLHGWX	Microscopic Examination	1 Pertaining to the documents marked "Q1" and "Q3": 1.1 There are small black toner particles present on top of the paper fibres which have a shiny appearance and which correspond with toner particles of "K2". The printing process used on the documents is Laser. 1.2 The toner marks present on "K2" correspond with the marks present on "Q1" and "Q3". The toner marks/blotches may be the results of defects which occurred in the light sensitive layer of the copier which get carried onto the paper in the form of blotches or marks. 2 Pertaining to the document marked "Q2": 2.1 There are irregular ink multi-coloured dots which look like tiny splashes with no distinct pattern present below paper fibres, which correspond with the ink dots on "K1". The printing process used on the document is Inkjet. 2.2 The ink marks present on "K1" correspond with the ink dots present on "Q2". The ink marks/blotches may be the results of defects which occurred in the light sensitive layer of the copier which get carried onto the paper in the form of blotches or marks.
BMWDDG	Video Spectral Comparator (VSC)	Scientific Method, applying the phases of: observation, signaling of the characteristics distinctives, comparison and identity judgments.
	Transmitted Light	The documents questioned, were subjected to analysis by laboratory equipment, using different sources of light (uv, transmitted ...) and making visual comparison with the blank exemplars prodeded by the copiers (K1 and K2).
	comparison techniques	

TABLE 2

WebCode	Methods/Techniques	Observations
BVAUYH	Macroscopic/Microscopic Examination	Initially a macroscopic observation was made to the questioned documents Q1., Q2 and Q3, in order to establish the characteristics that the substrates present, then a microscopic evaluation is made in order to find particularities in them and accordingly establish similarities between the documents of doubt
BXZJCP	Visual Examination	Examination of trash marks, trash marks were observed and compared from known to questioned items with positive results
	ESDA	Looking for any indented writing. No recovered indented writing
	Microscopic Examination	Printing Processes ink jet vs toner. different printing processes observed Q1 and Q3 to Q2
	Video Spectral Comparator (VSC)	Non destructive light examinations. No significant observations
BYU8RY	[No Methods Reported.]	
C4KB84	Microscopic Examination	Used to determine printing process, location and imaging of the trash marks/ additional print areas.
	Oblique Light	Used in combination with the ESDA for visualization and documentation of the presence and/or absence of indentations such as indented writing and/or machine markings.
	ESDA	Used in combination with oblique lighting for visualization and documentation of the presence and/or absence of indentations such as indented writing and/or machine markings.
	Overlays	Digital overlays were utilized to conduct a side-by-side comparison of location and morphology of trash marks/ additional print areas.
	Transmitted Light	Was used to check the documents for watermarks.
C7Q3QX	Visual Examination	Q1 and Q3 observations include black toner-based machine printing; white copy paper; significant number of trash marks; and no significant creases or wear. Q2 observations include color inkjet-based machine printing; white copy paper; significant number of trash marks; and no significant creases or wear. K1 observations include white copy paper; significant number of trash marks; and no significant creases or wear. K2 observations include white copy paper; significant number of trash marks; and no significant creases or wear.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	<p>Q1 and Q3 microscopic examination enabled confirmation of black toner-based machine printing characteristics; and observations included size, shape, color, and type of trash marks; and size and shape of indentations (possibly due to roller wheels). Q2 microscopic examination enabled confirmation of color inkjet-based machine printing characteristics; and observations included banding (within machine printed images); size, shape, color, and type of trash marks; and two, somewhat parallel, possible picker bar or gripper marks on front right edge of document. K1 microscopic examination enabled observation of color inkjet-based machine printing characteristics; size, shape, color, and type of trash marks; and no distinctive paper fiber disturbances. K2 microscopic examination enabled observation of black toner-based machine printing characteristics; size, shape, color, and type of trash marks; size and shape of indentations (possibly due to roller wheels); and toner scatter with somewhat significant amount near bottom edge of page, possibly leading edge scatter - rollers and contact points may need cleaning. K1 and K2 exemplars, each, have several more significant trash marks in comparison with each of the Q1, Q2, and Q3 questioned notes. K2b (the second K2 exemplar) has one possible additional trash mark. Many K1 trash marks are of similar size and shape in comparison with Q2 trash marks. Many of K2 trash marks are of similar size, shape and location in comparison with Q1 trash marks. Many of K2 trash marks are of similar size and shape in comparison with Q3 trash marks.</p>
	Oblique Light	<p>Q1 oblique light examination enhanced visualization of indentations - size, shape, and location (repeated indentations across the width of page at approximately 4-inches from the top and approximately 4.5-inches from the bottom of the document possibly due to roller wheels). Q2 oblique light examination enhanced visualization of indentations - size, shape, and location (two, somewhat parallel, possible picker bar or gripper marks on right edge of the document at approximately 5-inches from top and approximately 5.25-inches from bottom). Q3 oblique light examination enhanced visualization of indentations - size, shape, and location (repeated indentations across the width of page at approximately 4.5-inches from the top and approximately 4-inches from the bottom of the document possibly due to roller wheels). K1 exemplars included no distinctive paper fiber disturbances. K2 oblique light examination enhanced visualization of indentations - size, shape, and location (repeated indentations across the width of page at approximately 4-inches from the top and approximately 4.5-inches from the bottom of the document possibly due to roller wheels). K2 indentations are of similar size, shape and location in comparison with indentations of Q1 and Q3 rotated 180-degrees.</p>

TABLE 2

WebCode	Methods/Techniques	Observations
	Overlays	Q1-Q3 overlays demonstrate the approximate size, shape, and location for each of the significant trash marks observed. K1 overlay demonstrates the approximate size, shape, and location for additional significant trash marks observed, which align in comparison with each of the other K1 exemplars. K2 overlay demonstrates the approximate size, shape, and location for additional significant trash marks observed, which align in comparison with each of the other K2 exemplars. Q1 overlay trash marks align in approximate size, shape, and location with K2 exemplar trash marks, except additional K2 trash marks and one K2 trash mark that was not observed in examination of Q1 due to machine printed Q1 image in the location of the K2 trash mark. Q2 overlay trash marks rotated 180-degrees align in approximate size, shape, and location with K1 exemplar trash marks, except additional K1 trash marks. Q3 overlay trash marks rotated 180-degrees align in approximate size, shape, and location with K2 exemplar trash marks, except additional K2 trash marks and one K2 trash mark that was not observed in examination of Q3 due to machine printed Q3 image in the location of the K2 trash mark.
	Product Research	Manufacturer websites (Kodak and Canon USA) provided copier specifications to confirm the printing process of each known copier. In addition, an attempt was made to research the potential significance of codes, design, defects, or other information that the copiers may produce. Kodak specifications state that the Kodak ESP Office 2170 copier is an all-in-one printer that features black and color printing and uses Continuous-tone Thermal Inkjet print technology. Canon specifications state that the Canon Image Runner 3225 copier is a Monochrome Digital Multifunction Imaging System using Laser Dry Electrostatic Transfer imaging system and Dry Monocomponent Toner Projection developing system. Class characteristics of the known exemplars are similar to each of the corresponding specifications noted through product research.
C9VRWD	Microscopic Comparison	Similar trash marks were observed between Exhibit Q2 and Exhibit K1. Similar trash marks were observed between Exhibits Q1 and K2, Q3 and K2.
	Ink Examination (Ultraviolet Examination)	No difference in fluorescence were observed between Exhibits Q1-Q3 with K1-K2.
	Indented Examination (ESDA)	No indentations were observed on Exhibits Q1-Q3 and K1-K2.
CCWXAX	Overlays	Trash marks of K1 match Q2. Trash marks of K2 match Q1 and Q3.
	Oblique Light	Roller marks on Q1 and Q3 match K2.
CXT9ZX	Microscopic Examination	"Q1", "Q3" and "K2" all printed in black and white laser printing. "Q2" and "K1" printed in multicoloured inkjet printing.
	Microscopic and superimposing software	Trash marks identified on "Q1", "Q3" and "K2" all match. Trash marks identified on "Q2" and "K1" all match.
D4ZHJK	Microscopic Examination	Using the Stereo microscope at 6.7X magnification, the clusters of trash marks were examined to identify unique clusters in common.
	Overlays	Transparency overlays were created and used to overlay on Q1, Q2 and Q3 to observe trash marks from K1 and K2.
	Photocopier	Used to copy K1 and K2 and create transparency sheets to overlay on Q1, Q2 and Q3 and observe trash marks.

TABLE 2

WebCode	Methods/Techniques	Observations
D773P6	ESDA Video Spectral Comparator (VSC) Microscopic Examination	Q1/Q2/Q3 – Found no indented handwriting; Q1/Q3 – Found a pattern of horizontal lines/bands. Q2 – Found no pattern of horizontal lines / small rectangle noted (perhaps from paper feed mechanism). K1 - No pattern of horizontal lines / small rectangle noted similar to that on Q2. K2 – Pattern of horizontal lines similar to those on Q1/Q3. Q1/Q2/Q3/K1/K2 – Observed vertical lines on all documents / Verified that they appear on a blank page and are unrelated to the production of the Q and K items Created annotated images showing extraneous marks. Checked for irregularities using UV (none noted). Q1/Q3 SIDE LIGHT - two indented lines revealed – one with gaps and the other less indented (gaps are less apparent). Q2 SIDE LIGHT – no indented lines. K1 SIDE LIGHT – no indented lines. K2 SIDE LIGHT – two indented lines revealed – one with gaps and the other less indented (gaps are less apparent) Identified production methods for the documents: Q1/Q3 – black toner; Q2 – color inkjet; K1 – color inkjet; K2 – black toner
DA4Z3X	Microscopic Examination	After an examination and comparison, the following observations were made: 1 There are corresponding trash marks on the documents marked “K1” and “Q2”, with regard to placement and shape; 2 There are corresponding trash marks on the documents marked “K2” to that of “Q1”; and “Q3”, with regard to placement and shape; 3 There are corresponding trash marks printed on the document marked “Q2”, by using the same Inkjet printing method, to that of the printed trash marks on the documents marked “K1”; 4 There are corresponding trash marks printed on the documents marked “Q1” and “Q3”, by using the same Laser printing method, to that of the printed trash marks on the documents marked “K2”.
DBEB7A	[No Methods Reported.]	The different physical properties of toners on paper are related to both their composition and methods used to fuse toners to the paper. Simple observation made by low power microscopy. The toner traces on documents (Q1 & Q2) match the toner traces fused from printer (K2) and the toner traces on document (Q2) mach the toner traces fused from printer (K1).
DBWRF4	Video Spectral Comparator (VSC) ESDA Microscopic Examination Overlays Transmitted Light Ruler	used VSC and oblique lighting to examine all documents, noting roller marks/lines of indentations; used VSC in combination with magnetic ink visualizer to assess possible presence of magnetic components of toner examined all documents for indented writing used high magnification to examine items for printing process and also for the assessment of the morphology of trash marks Used overlays to map out the location of the trash marks for comparison looked for watermarks measured how far apart machine markings were
DEG8YP	Macroscopic Examination	Analysis of trash marks (toner spots) on every sheet of paper (samples Q and K).

TABLE 2

WebCode	Methods/Techniques	Observations
DEUBDW	Microscopic Examination	After an examination and comparison, the following observations were made: 1.1 The documents marked "Q1", "Q3" and "K2" were generated using the Laser printing process. 1.2 The documents marked "Q2" and "K1" were generated using the Inkjet printing process. 1.3 There are corresponding thrash marks on the documents marked "Q1", "Q3" and "K2". 1.4 There are corresponding thrash marks on the documents marked "Q2" and "K1".
DFBVEY	Microscopic Examination	Printing technique: K1: Inkjet; K2: Toner; Q1: Toner; Q2: Inkjet; Q3: Toner
	Oblique Light	Marks from "feed rollers" found in same position on K2, Q1 and Q3.
	Visual Examination	Reproduced "dirt" and possible printing defects found in the exact same positions on K2, Q1 and Q3 and the same goes for K1 and Q2 (overlying in Photoshop used).
DGMPY7	Visual Examination	Q1 through Q3 bear trash marks across the surface of the documents. The K1 and K2 exemplars also bear trash marks across the surface of the documents.
	Microscopic Examination	Q1 and Q3 were produced using an electrostatic (laser printer/ photocopier) process with black toner. Q2 was produced using a color ink jet process. The K2 samples bear trash marks that were produced with black toner. The K1 exemplars bear trash marks that were produced using color ink jet.
	Overlays	I overlaid Q1 with a transparency sheet and circled the toner trash marks I observed on the document with blue ink. I then overlaid the marked transparency sheet with Q2 and Q3 to see if the same pattern of trash marks appeared on these documents as well. The same pattern was observed on Q3 (when rotated 180 degrees) but was different for Q2. I compared the marked transparency from Q1 and Q3 to exemplars K1 and K2. The pattern matched with the pattern observed on the K2 exemplars. Under magnification, it was confirmed that the K2 samples were also produced with black toner. In addition to being in the same locations, the trash marks were similar in size and shape. I overlaid Q2 with a new transparency sheet and circled the trash marks I observed with blue ink. I then compared the marked transparency to the pattern of observed trash marks on the K1 exemplars. The pattern was the same. Under magnification, it was revealed that the trash marks observed on the K1 exemplars were also produced using color ink jet. In addition to being in the same locations, the trash marks were similar in size and shape.
	Ultraviolet Light	I examined the questioned documents under UV light. All exhibited a similar level of UV florescence.
	ESDA	Marks/indentations caused by the document feeder of a printer/copier can sometimes be used to associate documents as having a common source. Using the ESDA2 machine, I examined the Q1 through Q3 documents for feeder marks. I verified the functionality of the ESDA 2 using a verification test strip each time an item of evidence was processed. Negative results.

TABLE 2

WebCode	Methods/Techniques	Observations
DPYNQW	Macroscopic/Microscopic Examination	Microscopic/Macroscopic examination – trash marks are visible. Magnification (hand held magnifier, stereo microscope) reveals trash marks visible on Items Q1- Q3 and K1 and K2. Item Q1 and Q3 are produced with toner technology. Item Q2 is produced with ink jet technology – colored half tones are visible under magnification. Item K1 is produced with ink jet technology – colored half tones are visible. Item K2 is produced with toner technology.
	Oblique Light	Gripper marks observed in 2 places on Items Q1, Q3 and K2.
	ESDA	Items Q1, Q2 and Q3. No indented writing observed. Test strip positive.
	Ultraviolet Light	Examined Items Q1, Q2, Q3, K1 and K2 under UV lighting with VSC6000 – did not appear to be any difference in optical brightness. Test strip positive.
DUV9VF	ESDA	Rollermarks pattern detected on Q1 and Q3. Absent on Q2. No indented writing detected.
	Photoshop	Scans of all documents were made. Trashmark pattern constellations were observed on all documents. Two patterns were noted. Q1 and Q3 possessed the same pattern as K2 (library) and Q2 possessed the same pattern as K1 (classroom).
DXVLFK	Ruler	Q-1 to K-1 - K-1 eliminated. Q-1 to K-2 - Agreement in form and measurements of trash marks. Q-2 to K-1 - Agreement in form and measurements of trash marks. Q-2 to K-2 - K-2 eliminated. Q-3 to K-1 - K-1 eliminated. Q-3 to K-2 - Agreement in form and measurements of trash marks.
	ESDA	Questioned exhibits examined with the ESDA, nothing of evidentiary value found.
E2MM3D	Video Spectral Comparator (VSC)	The questioned note marked "Q1" has the same marks, patterns and defects as the exemplars marked "K2". The questioned note marked "Q2" has the same marks, patterns and defects as the exemplars marked "K1". The questioned note marked "Q3" has the same identification marks, patterns and defects as the exemplars marked "K2".
EKET7X	Microscopic Examination	To view the marks made by the photocopiers in details.
	Visual Examination	comparison technique: compared the marks on the questioned notes with those on the blank exemplar.

TABLE 2

WebCode	Methods/Techniques	Observations
EKZ7WW	Microscopic Examination	<p>After an examination and comparison, the following observations were made: 1 Pertaining to documents labelled as "Q1", "Q3" and "K2" 1.1 The toner particles at the edges of the trash marks on the notes in question marked "Q1", "Q3" and blank exemplars marked "K2" were revealed when the documents were viewed under Microscope. The three documents have the same laser printing process. 1.2 The red trash marks are from the note in question marked "Q1" and the green trash marks are from the blank exemplar marked "K2". The shape of the trash marks on the note in question marked "Q1" and shape of the trash marks on the blank exemplar "K2" are similar to each other, when Superimposed. 1.3 The red trash marks are from the note in question marked "Q3" and the green trash marks are from the blank exemplar marked "K2". The shape of the trash marks on the note in question marked "Q3" and the shape of the trash marks on the blank exemplar marked "K2" are similar to each other, when Superimposed. 2 Pertaining to documents labelled as "Q2", and "K1" 2.1 Multi-coloured dots of the trash marks on the note in question marked "Q2" and multi-coloured dots of the blank exemplars marked "K1" were identified when the documents were viewed under Microscope and the two documents have the same inkjet printing process. 2.2 The red trash marks are from the note in question marked "Q2" and the green trash marks are from the blank exemplar marked "K1". The shape of the trash marks on the note in question marked "Q2" and the shape of the trash marks on the blank exemplar marked "K1" are similar to each other, when Superimposed.</p>
EM8JH4	Macroscopic Examination	Observed "trash marks" on Items 1 - 5 (Q1, Q2, Q3, K1, K2).
	Microscopic Examination	Determined printing process of Items 1 - 5 (Q1, Q2, Q3, K1, K2).
	Oblique Light	Observed horizontal impression lines on Item 1(Q1), Item 3 (Q3), and Item 5 (K2).
	ESDA	Examined for Indented writing - None observed.
EMP3AA	Microscopic Examination	Print process identification: Inkjet & Electro-photographic. Printing faults and printer defects
	Overlays	Overlay of the documents to identify common print faults and printer defects.
	Oblique Light	Roller marks from the eletro-photographic printing device
	Ultraviolet Light	Nil result
	Infrared Light	Nil Result
	ESDA	Nil Result
EWGC3D	Oblique Light	All the documents were examined using side lighting and it was observed that there were latent indentations present on Q1 and Q3. These impressions progressed horizontally across the page. Similar impressions were observed on the pages created using copier K2. No similar indentations were observed on Q2 or on the pages created using copier K1.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	ESDA development showed a single band across the middle of the front and back of Q1 and Q3 but no such band was observed on Q2. A similar band was developed on the front and back of all three sheets produced by copier K2 and no band was observed on the front or back of any of the three sheets produced by copier K1.
	Macroscopic/Microscopic Examination	All the documents were examined at higher magnification: i. all three questioned notes were observed to contain "trash marks"; ii. all pages created using copier K1 and copier K2 were also observed to contain "trash marks"; iii. Q1 and Q3 were printed using Black toner (EP); iv. Q2 was printed using colour Ink Jet
	Overlays	The documents were used to create transparencies of each of the Q notes and each page of K1 and K2 in order to compare and assess the presence and placement of the observed "trash marks". It was observed that a) When transparencies from K1 were compared to Q1, Q2 and Q3: i. Q1 showed no points of congruence with respect to the presence and placement of the observed "trash marks"; ii. Q2 showed several points of congruence with respect to the presence and placement of the observed "trash marks". These points of congruence were circled on the transparency to identify their locations. iii. Q3 showed no points of congruence with respect to the presence and placement of the observed "trash marks"; b) When transparencies from K2 were compared to Q1, Q2 and Q3: i. Q1 showed several points of congruence with respect to the presence and placement of the observed "trash marks". These points of congruence were circled on the transparency to identify their locations. ii. Q2 showed no points of congruence with respect to the presence and placement of the observed "trash marks"; iii. Q3 showed several points of congruence with respect to the presence and placement of the observed "trash marks". These points of congruence were circled on the transparency to identify their locations. Note: Q3 was observed to be reversed when compared to the orientation of Q1 when comparing the "trash marks". Once the orientation of Q3 was changed, the patterns of "trash marks" were observed to line up with Q1 as well as with the transparencies from K2.
EX3XEU	Microscopic Examination	The microscope was used to identify the printing process of the questioned and exemplar documents.
	Video Spectral Comparator (VSC)	A comparison technique was used to superimpose the images of the questioned and exemplar documents to identify if the trash marks correspond to each other.
EXP4ZF	Oblique Light	Impression/indentation horizontal lines (possible machine roller/gripper marks or defects. Indented writing neg.
	Transmitted Light	Watermark neg.
	ESDA	Indented writing neg. Positive for banding/roller impressions on some of the items
	Macroscopic/Microscopic Examination	Printing processes - I1 (Q1), I3 (Q3), & I5 (K2) - toner. I2 (Q2) & I4 (K1) - IJ; "Trash Mark" analysis.
	Overlays	"Trash Mark" analysis as well on all documents (size, location, & morphology for each set)
	Video Spectral Comparator (VSC)	paper, toner, ink reactions neg.

TABLE 2

WebCode	Methods/Techniques	Observations
EZAK6Y	Overlays	Transparent copies of the known exemplars K1 and K2 were made, these copies were then superimposed on the questioned documents Q1, Q2 and Q3 to see if there are any corresponding marks.
F3CZQV	Microscopic Examination Video Spectral Comparator (VSC)	2. Similar trash marks were identified between the questioned documents marked "Q1", "Q3" and the known exemplars marked "K2" supporting the evidence that "K2" was used in the production of the questioned documents marked "Q1" and "Q3". 2. Similar trash marks were identified between the questioned document marked "Q2", and the known exemplars marked "K1" supporting the evidence that "K1" was used in the production of the questioned documents marked "Q2". Through the use of flood light distinct trash marks were also identified on Q1 and Q3 matching those found on K2. Trash marks on Q2 were also found matching those found on K1.
F49A67	Microscopic and Macroscopic Analyze Superposition Images	We could see that the questioned documents "Q1" and "Q3" were printed by a laser (toner) printer while "Q2" was printed by an inkjet one. Also we saw that questioned documents "Q1" and "Q3" had similar marks to the known copy produced by Canon Image Runner printer. In the case of "Q2" had similar marks to the known copy printed by Kodak ESP Office 2170 printer.
FKBM7F	Visual Examination	Comparative examination by juxtaposition
FPB8H8	Scanner FUJITSU, model SCAN SNAP S1500 and scanner EPSON, model V600 PHOTO Comparator microscope PROJECTINA, model UCM Stereoscopic microscope LEICA, model S6D Video spectral comparator PROJECTINA, model DOCUCENTER NIRVIS	Scanning of the evidences submitted to study at 300 dpi resolution. Comparative study of possible individualizing marks: Questioned notes Q1 and Q3 and sample K2, have the same spatial location of the marks left by the printing element. Questioned note Q2 and sample K1, have the same spatial location of the marks left by the printing element. Study of the print frames that present the different evidences, to determine the printing techniques used for the reproduction of the evidences: Questioned notes Q1 and Q3: photoelectric prints (laser or led). Questioned notes Q1 and Q3: both present print by monochrome black toner (photoelectric prints). Questioned note Q2: printing inkjet in four-color. Use of infrared light sources in their luminescence excitation modes and in absorption mode. Questioned note Q1 y Q3, identical reaction that K2 sample. Questioned note Q1, same reaction as K1 sample.
FTRMV6	Visual Examination Ultraviolet Light Oblique Light Microscopic Examination Indented Writing	Examined visually the substrate (paper documents) to determine the paper size, color, absence of water marks. Examined visually using the UV light box to indicate similar optical properties. Examined visually using side lighting to check for indentations, no impressions of value were found. Utilizing the microscope to determine the print process used in questioned and known documents. Utilizing the Electrostatic Detection Apparatus to reveal indentations on both questioned and known documents.

TABLE 2

WebCode	Methods/Techniques	Observations
	Digital Imaging	Scanned documents for future reference and to provide court charts if needed.
	Adobe Photoshop (overlays)	Utilizing software to scan the documents, overlaying the known onto the questioned document to align and compare the trash marks as to their significance.
G2DMU9	Video Spectral Comparator (VSC)	UNIQUE BLACK MARKS ON QUESTIONED NOTE MARKED "Q2" APPEAR ON THE BLANK EXEMPLARS MARKED "K1" AND ARE ON THE SAME POSITION WHEN SUPERIMPOSED.
	Video Spectral Comparator (VSC)	UNIQUE BLACK MARKS ON QUESTIONED NOTES MARKED "Q1" AND "Q3" APPEAR ON THE BLANK EXEMPLARS MARKED "K2" AND ARE ON THE SAME POSITION WHEN SUPERIMPOSED.
G43EY6	Microscopic Examination	The Q1 and Q3 documents were produced by electro-photography imaging technology, used black toner. The printing technique features correspond with K2 exemplars. The Q2 document was produced by inkjet printing, used black and colour inks. The printing technique features correspond with K1 exemplars.
	Video Spectral Comparator (VSC)	The trash marks on the K1 exemplar are very similar (relative position, form) to those appeared on the Q2 document. The trash marks on the K2 exemplar are very similar (relative position, form) to those appeared on the Q1 document. The trash marks on the K2 exemplar are very similar (relative position, form) to those appeared on the Q3 document.
GAUN94	Visual Examination	Identification of trash marks.
	Ultraviolet Light	Used both short wave and long wave UV light on all documents= positive
	ESDA	Laboratory items #1-5, Invoice # Q1121167 were examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Aside from the laboratory number, lab item number, envelope outline, paper outline, or extraneous markings - no impressions were found.
	Microscopic Examination	a. Laboratory item #1 (K1A-K1C)- Inkjet process; b. Laboratory item #2 (K2A-K2C)- dry toner process; c. Laboratory item #3 (Q1)- Dry toner process; d. Laboratory item #4 (Q2)- Inkjet process; e. Laboratory item #5 (Q3)- Dry toner process
	Oblique Light	Negative indented impressions observed.
	Transmitted Light	a. Sufficient class and individual characteristics are present on the questioned documents (Laboratory items #3 (Q1) and #5 (Q3), Invoice #Q1121167) to determine that the documents were produced by the same photocopier (Laboratory item #2 (K2A-K2C), Invoice #Q1121167). b. Sufficient class and individual characteristics are present on the questioned document (Laboratory item #4 (Q2), Invoice #Q1121167) to determine that the document was produced by the same photocopier, Laboratory item #1 (K1-K1C), Invoice #Q1121167.
GFJLZU	Microscopic Examination	The printing methods of "Q1" "Q3" and "K2" are laser,, whereas "Q2" and "K1" are inkjet.
	Video Spectral Comparator (VSC)	Questioned Documents and exemplars were superimposed. "Trash marks" found on "Q1" and "Q3" correspond to those on "K2". "Trash marks" on "Q2" correspond to "K1".

TABLE 2

WebCode	Methods/Techniques	Observations
GFYKT4	Visual Examination	Visual and microscopic examination revealed the presence of non-impact print process as follows: Laboratory item # 1, K1a-K1c: inkjet; Laboratory item # 2, K2a-K2c: dry toner; Laboratory item # 3, Q1: dry toner; Laboratory item # 4, Q2: inkjet; Laboratory item # 5, Q3: dry toner
	Microscopic Examination	Visual and microscopic examination revealed the presence of non-impact print process as follows: Laboratory item # 1, K1a-K1c: inkjet; Laboratory item # 2, K2a-K2c: dry toner; Laboratory item # 3, Q1: dry toner; Laboratory item # 4, Q2: inkjet; Laboratory item # 5, Q3: dry toner
	Digital imaging	Laboratory items # 1 through # 5, Invoice # Q1121165 were digitally imaged for future reference.
	ESDA	Laboratory items # 1 through # 5 (K1a-K1c, K2a-K2c, Q1-Q3-all documents front and back), Invoice # Q1121165 were examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Aside from the laboratory number, lab item number, envelope outline, paper outline, or extraneous markings - no impressions were found.
	Adobe Photoshop	Laboratory items # 1 through # 5, Invoice # Q1121165 were digitally imaged for future reference.
GQFAR9	ESDA	Using Electrostatic Detection Apparatus (ESDA 2), no indented impression of handwriting was deciphered for Q1, Q2 and Q3.
	Superimposition of questioned notes with specimen documents	The questioned notes "Q1" "Q2" and "Q3" were superimposed with specimen documents "K1" and "K2" by overlapping using transparency slides. Trash marks present on "Q1" and "Q3" are corresponded/ consistent with specimens "K2". Whereas, trash marks on "Q2" are corresponded/ consistent with specimens "K1".
	Visual Examination	Trash marks were observed on "Q1", "Q2", "Q3", "K1" and "K2".
	Comparison of trash marks between questioned notes and specimens	Similar and consistent trash marks were observed on questioned notes "Q1", "Q2" and specimen documents "K2". Similar and consistent trash marks were observed on questioned note "Q3" and specimen documents "K1"
GVTZ9W	Visual Examination	Each questioned document was evaluated using VSC. Both Q1 and Q3 have the same stain and indentation pattern with K2. Q2 has the same stain pattern with K1.
	Video Spectral Comparator (VSC) Macroscopic/Microscopic Examination	
H2Y78Z	Visual Examination	
	Microscopic Examination	
	Video Spectral Comparator (VSC)	
H387KU	Macroscopic Examination	Various printing methods were identified between the questioned document and the two specimens "K1" and "K2".

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	Identical marks were observed between the known specimen document K2" and the questioned documents "Q1 and "Q3". Identical marks were observed between the known specimen document K1" and the questioned documents "Q2".
	Overlays	Transparencies were made from the known specimens "K1 and "K2" and were placed on top of the questioned documents. It was found that the marks corresponds.
H4YTRB	Microscopic Examination	Printing Processes (Q1, Q3, K2 - toner; Q2, K1 - inkjet)
	ESDA	Indented writing - negative
	Video Spectral Comparator (VSC)	Trashmark morphology, Horizontal indented lines on Q1, Q3, K2
	Oblique Light	Indented writing - negative
	Transmitted Light	Watermarks - negative
H78EP4	Visual Examination	obvious 'trash' marks matching Q1 and Q3 to K2 and Q2 to K1
	Microscopic Examination	Q1/Q3/K2 similar image - toner. Q2/K1 similar image - colour ink jet
	Overlays	marks Q1/Q3/K2 correspond. marks Q2/K1 correspond
	Oblique Light	indents visible on Q1/Q3/K2 *. no indents noted on Q2/K1. *is a faulty paper handling mechanism seen using oblique light on Q1, Q3 and K2
	ESDA	indents from machine handling same on Q1/Q3/K2. indents from machine handling similar on Q2 and K1
	Video Spectral Comparator (VSC)	paper on all is similar. Toner similar for Q1, Q3, k2. Inkjet ink similar Q2/K1
HCCA94	Visual Examination	UNAIDED EYE NOTICED DIFFERENCES AND SIMILARITIES IN THE TRASH MARK PATTERNS OF Q-1 THROUGH Q-3 WHEN COMPARED TO K-2 AND K-2.
	Microscopic Examination	MICROSCOPIC EXAMINATION REVEALED TRASH MARKS MATCHED THE PRINTERS IN QUESTION.
	Overlays	BY REVERSING THE PAGES OF K-1 AND K-2 SO TOP BECOMES BOTTOM AND BOTTOM BECOMES TOP, PAGES WERE IDENTIFIED AS HAVING THE SAME TRASH MARKS AS NOTED ON MY PAGE ON OF PAGE FOUR.
HFE4BF	Visual Examination	Deductive method: observation, description, comparison and judgment.
	Macroscopic/Microscopic Examination	
HQWQKG	Macroscopic/Microscopic Examination	The sample of the photocopier "K1" contains morpho-typical identities in its location and size compared to the sample "Q2".
	Visual Examination	The sample of the photocopier "K2" contains morpho-typical identities in its location and size in comparison to the samples "Q1" and "Q2".

TABLE 2

WebCode	Methods/Techniques	Observations
HT2BA2	Macroscopic/Microscopic Examination Overlays Video Spectral Comparator (VSC)	Q2-produced using color copy process, Q1 and Q3 produced using black toner process. All three questioned documents contain trash marks. Q1 and Q3 also have 2 indented roller marks present (sim. locations); K1 - color copy process, trash marks; K2- black toner, trash and roller marks Overlays made of trash marks of Q1, Q2, and Q3 and K1 and K2, and compared. Trash marks correspond between Q2 and K1; Q1, Q3 (when inverted) and K2. Unable to differentiate paper, no watermarks observed. Unable to differentiate toner Q1, Q3, and K2; Q2 and K1; side lighting used to photograph roller marks Q1, Q3, and K2- correspond in number, location (when Q3 inverted)
HYBJQ7	Vacuum box (examination for indented writing/printing latent marks) VSC 6000 (Video Spectral) Examination of printing techniques Examen of defaults	Tool's marks exist on items Q1 and Q3 and are similare left by the printer K2, Q1=Q3=K2. Q1 and Q3: presence of toner grains, monochrome laser printing. Q2: Ink diffusion and presence ok characteristic flaws of an inkjet printing a tri-color (ex: print head clogged). K1: defects in the scanner glass of the printer are come from a tri-color inkjet impression. K2: presence of toner grains, monochrome laser printing. Q1=Q3=K2=laser printing. Q2=K1=inkjet printing. The position and the morphology of the defects of the pieces Q1, Q3 and K2 are identical (overlay by transparent printing). The position and the morphology of the defects of the pieces Q2 and K1 are identical (overlay by transparent printing). Q1=Q3=K2. Q2=K1.
JD37JY	Video Spectral Comparator (VSC)	1. The patterns, marks and defects found on the document marked as "Q1" are the same patterns, marks and defects on the document marked as "K2". 2. The patterns, marks and defects found on the document marked as "Q2" are the same patterns, marks and defects on the document marked as "K1". 3. The patterns, marks and defects found on the document marked as "Q3" are the same patterns, marks and defects on the document marked as "K2"
JN2L3T	Macroscopic Examination Microscopic Examination	This included direct and transparency photocopy overlays to determine that particular patterns of reproduction trash marks of unknown origin essentially matched in terms of trash mark shapes and relative locations between Q1 and K2; Q2 and K1 (when K1 was rotated 180o); and Q3 and K2 (when K2 was rotated 180 o). (The label affixed to the back of each document is taken to be at the "top" of the document.) Other print defects were also observed on the documents. To determine the nature of the print on each document and whether the detailed appearance of the trash marks on each questioned document was similar or different to the appearance of the corresponding trash marks on the known documents. In this case, the trash marks on Q1, Q3 and K2 were found to be indistinguishable in appearance and shape and, including the microscope appearance of the print, were indicative of the documents being the product of a black toner print/reproduction process. The trash marks on Q2 and K1 were found to be indistinguishable in appearance and shape and, including the microscope appearance of the print, were indicative of the documents being the product of a colour ink jet print/reproduction process.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	To determine whether or not there are any marks recorded on the ESDA film (such as are often found on printed/machine reproduced documents caused by the effects of the machine's paper transport rollers on the document) which are in common between the front and/or back of questioned documents and the front and/or back of known documents. In this case no detectable machine effects were observed on documents Q2 and K1. This observation provides corroboration of the other observations leading to the conclusion expressed with regard to Q2. Machine effects in the form of similar sets of marks, predominantly in the form of horizontal bands, were detected on the ESDA films of the fronts of each of Q1, Q3 and K2, and separate such patterns were observed on such images of the backs of each of these documents. These observations provides corroboration of the other observations leading to the conclusions expressed with regard to Q1 and Q3.
	Video Spectral Comparator (VSC)	To examine and compare the selected wavelength visible and near infrared properties of the paper of and print on each document when illuminated with a variety of selected wavelength ultraviolet and intense visible light sources. In this case no differences were found in relation to the visible response under ultraviolet "illumination" or in the visible and infrared absorption properties nor in the red/infrared luminescence properties of the paper of and print on any of the documents examined. These observations provide corroboration of the other observations leading to the conclusions expressed with regard to Q1, Q2 and Q3. These are preliminary observations only, and more time would normally be spent on this examination.
	Background research	To obtain information regarding Kodak ESP Office 2170 and Canon Image Runner 3225 printer/copier machines. The information obtained corroborates the print methods of the two known printer/copier machines.
JQQVDF	Microscopic Examination	Exhibits Q1, Q3 and K2 (1) were determined to be prepared using black toner printing technology. Exhibits Q2 and K1 (1) were determined to be prepared using color liquid inkjet printing technology. Exhibits Q1, Q2 and Q3 revealed numerous print defects.
	Overlays	Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) also revealed a similar pattern of extraneous markings known as "trash marks", which indicate these exhibits originated from a common source. Exhibits Q1 and Q3 were prepared using Exhibit K2 (1). Exhibit Q2 was prepared using Exhibit K1 (1).
	ESDA	The front and back of Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) were examined for the presence of machine-created indentations using the Electrostatic Detection Apparatus (ESDA) with positive results. The machine-created indentations present on Exhibits Q1 and Q3 are of the same type and design as the machine-created indentations present on Exhibit K2 (1). Exhibits Q2 and Exhibit K1 (1) positive for unknown impressions; however, they were not suitable for comparison..
	Video Spectral Comparator (VSC)	Exhibits Q1, Q2 and Q3 revealed numerous print defects. Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) also revealed a similar pattern of extraneous markings known as "trash marks", which indicate these exhibits originated from a common source.
	Transmitted Light	The machine-created indentations present on Exhibits Q1 and Q3 are of the same type and design as the machine-created indentations present on Exhibit K2 (1). The presence of these indentations further indicates evidence of a common source.

TABLE 2

WebCode	Methods/Techniques	Observations
JQRXV8	Microscopic Examination	Based on microscopic examination It was labeled on Q1, Q3 and K2 were printed using „Laser jet “technique.
	VSC 6000 examination	Based on microcopic examination it was labeled on Q2 and K1 were printed using „ Ink-jet “ technique.
JWW2Y8	Video Spectral Comparator (VSC) Transmitted Light	I HAVE IDENTIFIED IDENTICAL MARKS
JYMNLA	Visual Examination	The blank exemplars K1 and K2 show individual marks/characters. The marks on K1 differ from the marks on K2. The three notes Q1, Q2 and Q3 show individual marks/characters too. Q1 and Q3 show the same marks, but rotated 90°. Q2 shows different marks. Compared with each other, K1 shows the same individual marks as Q2. K2 shows the same marks as Q1 and Q3.
	Microscopic Examination	Same printing technique (ink jet printing) was used for K1 and Q2, the inks show the same appearance. Same printing technique (laser printing) was used for K2 and Q1+Q3, the toner particles show the same appearance.
	Transmitted Light	See "visual examination".
	Video Spectral Comparator (VSC) Analysis of magnetic toner components	No differences can be observed between K1 and Q2 plus between K2 and Q1+Q3. For K2, Q1 und Q3 magnetic toner was used.
K26MM6	Photocopy	Made copies of both the disputed and specimen documents on the transparencies to superimpose in order to verify any similarities and differences
	Scanner	Scanned the documents to compile a study board for illustration purposes
K323UV	Video Spectral Comparator (VSC)	FLOOD LIGHT: WHEN K1 (BLANK EXAMPLER) AND Q2 (QUESTIONED NOTE) ARE SUPERIMPOSED, THE BACKGROUND MARKINGS ON BOTH PAPERS HAVE THE SAME CONFIGURATION AND ARE ON THE SAME POSITION
	Video Spectral Comparator (VSC)	FLOOD LIGHT: WHEN K2 (BLANK EXAMPLER) IS OVERLAID ON Q1 AND ON Q2 (QUESTIONED NOTES, THE BACKGROUND MARKINGS ON BOTH PAPERS HAVE THE SAME CONFIGURATION AND ARE ON THE SAME POSITION
K3Y3KZ	Video Spectral Comparator (VSC)	1.The blank exemplars (K1, K2) and questioned notes (Q1, Q2, Q3) have no different UV fluorescence of paper samples. 2.There are no significant differences of IRR and IRL between the blank exemplars and questioned notes.
	Natural light and visual inspection including utilization of a stereomicroscope	1.Same printing processes, both K1 and Q2 were printed with liquid ink jet. No differences in ink type and color capability are on K1 and Q2. 2.The imaging processes of Q1 and Q3 is same with K2 using toner technology. There is no difference in toner type and toner fusion all of them.
	Examine the document macroscopically and microscopically	1.Consistent printing characteristics presented on Q2 and K1, for example banding, damage defects and improper or extraneous ink transfer. 2.Q1, Q3 and K2 have individualizing characteristics such as splattering effect of toner and reproducible or trash marks.

TABLE 2

WebCode	Methods/Techniques	Observations
KFNARW	Visual Examination	The visual observation and identification of corresponding defects which occurs on the documents.
	Microscopic Examination	Magnification and flood light in order to visually examine and compare any visible defects in respect of size, location and form.
	Video Spectral Comparator (VSC)	Magnification and flood light for examination and measurement (using the measuring tool function) of observed defects in respect of their location and alignment in relation to each other and the respective document, utilising the PROJETINA (Docucenter Nirvis PIA 7000).
KFPWXT	microscopic/macroscopic examination/visual examination	Q1 and Q3 were produced using toner copier. Q2 was produced using color inkjet copier. K1 was produced using KODAK ESP Office 2170 copier which uses color inkjet technology. K2 was produced using Canon Image Runner 3225 copier which uses toner technology. Similarities in trash marks, morphology (size and shape) and location observed between Q1 and Q3; Similarities in trash marks, morphology (size and shape) and location observed between Q1, Q3 and K2; Similarities in trash marks, morphology (size and shape) and location observed between Q2 and K1; No CPS (Counterfeit Protection System) code was observed on Q1, Q3 and K2.
	Transparency overlay / VSC / Comparison	Transparency sheets used to mark pattern and location of identifying "trash marks". Similarities in trash marks, morphology (size and shape) and location observed between Q1, Q3 and K2; Similarities in trash marks, morphology (size and shape) and location observed between Q2 and K1;
	Oblique Light Examination / VSC	Similar linear impressions from paper feeding mechanisms (roller/gripper) were observed on Q1, Q3, and K2. No impressions were observed on Q2 and K1.
	ESDA	No significant findings.
	IR/UV examination with VSC	No significant findings.
KJN4KC	Macroscopic/Microscopic Examination	This examiner observed the "trash marks" on the submitted known samples as well as the submitted questioned samples.
	Overlays	This examiner used overlay transparency sheets in order to illustrate the aforementioned trash marks and how they aligned on the questioned samples.
KJNHZC	Visual Examination	Visual inspection through the application of the technique of overlapping of documents, to analyze the coincidence of individual use, in its shape and location characteristics
KQMPAQ	Overlays	Using Transparencies and photoshop. K1 and Q2 have "trash marks" that overlay. K2, Q1, and Q3 have trash marks that overlay.
	Ultraviolet Light	Optical properties for the questioned documents and one of the knowns from K1 and K2 were the same.
	Microscopic Examination	To observe printing process and "trash marks" morphology. Keyence Microscope - K1 and Q2 are produced by inkjet printer. K2, Q1, and Q3 are produced by toner printer.
	Indented Writing	Observed indented impressions using side light and ESDA. Machine produced markings observed on K2, Q1, and Q3 that overlay.
KUB3D3	Microscopic Examination	Used to observe in detail the morphology of the marks present in the reference material K1 and K2 as in the questioned notes Q1, Q2 and Q3.

TABLE 2

WebCode	Methods/Techniques	Observations
	Comparison by YUSTAPOSITION	Used to observe simultaneously which marks or tracks present in the reference samples K1 and K2, also in the questioned notes Q1, Q2 and Q3.
	Comparison by SUPERPOSITION	Superimposition is made between the sheets of each reference group K1 and K2, in order to establish whether the marks or prints left by each photocopier are presented in the same way in each group. Sheets are superimposed, comparing the questioned notes Q1, Q2 and Q3, in front of the reference sheets K1 and K2, in order to visualize and verify the coincidence with the marks or traces present in each of the copies K1 and K2.
	Microspectrophotometry	Used to observe the spectral reaction in the reference samples K1 and K2 and the questioned notes Q1, Q2 and Q3.
KZCGWJ	Ultraviolet Light	No fluorescence was detected on Q1-Q3 and K1-K2.
	ESDA	Q1 - three sets of tram line wheel marks, the first pair very faint. Three horizontal band lines approximately 30mm tall consisting of a series of close set vertical lines, with a thick toner deposited line on the middle band at the right hand side of the paper. Q2 - Very faint wheel marks in a vertical plane, with a pair of tram lines more visible on the left hand side of the paper. Q3 - similar to Q1 but the bottom horizontal band was very faint and the toner deposit was at the middle left hand side. Wheel lines not detected in the ESDA transparency. K1 - Three sets of tram line (wheel) marks with the heaviest marks in uneven pressure on the far right hand side. K2 - three horizontal band marks across page with close set vertical lines, more prominent in the middle band, with a heavier toner deposit on the right hand side of this band. Three sets of tram line wheel marks, with uneven pressure, but more visible on one of the K2 sheets than the other two.
	Macroscopic/Microscopic Examination	Q1 - printed by electrostatic device using black toner. There was scattering of black toner over the paper, presence of trash marks in the form of concentrated black toner, and an couple of areas of many black toner deposits but not in the form of single black dot. Q2 - printed with an inkjet printer in colour, two areas where there are concentrations of coloured dots only, and the remainder of the trash marks are comprised of black and coloured dots. Scan lines from printer head observed. Q3 - printed using an electrostatic device using black toner, similar to Q1 in scattering of black toner over the paper. There are two areas of scattered clustered toner deposits. K1 - printed with an inkjet printer in colour, ink deposited in trash marks made up of coloured and black ink dots. There are two areas of concentrated coloured ink dots, but remainder of marks predominately in black with some coloured ink dots. K2 - printed by electrostatic device using black toner, scattering of toner over paper. Trash marks present and two areas of many black toner deposits, but not in a concentrated form.
	Overlays	Using acetate sheets for each of Q1-Q3 the trash marks were marked and the Q1-3 sheets were placed individually over K1 and K2 sample pages. Similarities in the position of most of the marks were observed with Q1 and K2, Q2 and K1 rotated 180 degrees, Q3 and K2 rotated 180 degrees.
L7GF6M	Macroscopic/Microscopic Examination	All Qs have similar composition on the page – the printed material appears to be cut outs of letters/words from other sources, placed on the page, and copied. The original documents would be suitable for a physical match comparison.

TABLE 2

WebCode	Methods/Techniques	Observations
	Print Process	The print process for Q1, Q3, and K2 was toner (black only). An individualizing pattern of trash marks (printed material in non-print areas on a document that repeat from one document to the next on a copier) was present on these pages and aligned when overlaid. The print process for Q2 and K1 was ink jet (cyan, yellow, magenta, and black). An individualizing pattern of trash marks (printed material in non-print areas on a document that repeat from one document to the next on a copier) was present on these pages and aligned when overlaid. The trash marks and the print process were different when comparing Q1 and Q3 to K1 and Q2 to K2 and Q1 and Q3 to Q2.
	Paper Comparison	No physical or optical differences were observed among the papers for Q1, Q2, Q3, K1, and K2. Similarities in class features such as color, physical dimensions, optical brightener, and paper fiber distribution were observed plus the lack of watermarks.
	Indented Writing	Indented impressions of at least two horizontal lines were visible with side lighting on Q1, Q3, and K2. Additional horizontal lines and a band of vertical lines approximately 1 1/8" long developed on the electrostatic detection device lifts across the middle of these pages. These lines may be associated with the transportation mechanisms (roller marks) within the K2 photocopier. These indented impressions were not observed on Q2 and K1.
LECFKF	Ruler	No meaningful differences in dimension
	Thickness	No meaningful differences in thickness
	Transmitted Light	No meaningful differences in paper weave patterns. No watermarks found
	Microscopic Examination	Paper - No spur marks noted. Printing: "Q1", "Q3" and "K2" - Printings were produced by electrophotography using black toners. No significant differences in the morphology of the toners. Trash marks of similar shapes were found in the same relative positions on paper. "Q2" and "K1" - Printings were produced by inkjet colour printer. Images were produced with inks of four colours - cyan, magenta, yellow and black - that overlapped with one another. Lines on images found. The presence of the lines could be due to defective nozzles in printing head. However, no recurring patterns could be deduced. Trash marks of similar shapes were found in the same relative positions on paper
	Video Spectral Comparator (VSC)	No meaningful differences in colour and intensity of the UV fluorescence of paper. No line patterns found on the paper under UV light
	ESDA	No paper-handling marks found
LJ3PUD	ESDA	The fronts and backs of Exhibits Q1, Q3 and K2 (1) were positive for machine-generated indentations. ESDA lifts created from the fronts and backs of Exhibits Q1, Q3, and K2 (1) were compared. The machine-generated indentations were of a similar pattern and design and gave evidence that Exhibits Q1, Q3, and K2 (1) originated from a common source. Note: Exhibits K1 (1) and K2 (1) were used as a representative sample of the known standards submitted as Exhibit K1 and K2. Exhibits Q2 and K1 (1) were positive for unknown impressions but were not suitable for comparison. The ESDA lifts were digitally scanned.

TABLE 2

WebCode	Methods/Techniques	Observations
	Overlays	Digital images of the ESDA lifts created from the fronts and backs of Exhibits Q1, Q3, and K2 (1) were examined using a digital overlay technique in Adobe Photoshop . The machine-generated indentations overlaid exactly giving further evidence of a common source between Exhibits Q1, Q3, and K2 (1) .
	Macroscopic/Microscopic Examination	A similar pattern of extraneous markings known as "trash marks" were noted on Exhibits Q1, Q3, and K2 (1-3) indicating these exhibits originated from a common source. Likewise, a similar pattern of "trash marks" was noted on Exhibits Q2 and K1 (1-3) indicating these exhibits originated from a common source. The two trash mark patters noted were distinct from one another. Further microscopic examination of Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) determined the use of two different printing processes. Exhibits Q1, Q3 and K2 (1) were prepared using black toner printing technology. Exhibits Q2 and K1 (1) were prepared using color liquid inkjet printing technology. Note: Exhibits K1 (1) and K2 (1) were used as a representative sample of the known standards submitted as Exhibit K1 and K2. Additionally, print defects were noted on Exhibits Q2 and K1 (1-3). These print defects were of the same type and gave further evidence of Exhibits Q2 and K1 (1-3) originating from a common source.
	Overlays	Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) were examined using a digital overlay technique in Adobe Photoshop. A similar pattern of extraneous markings known as "trash marks" were noted on Exhibits Q1, Q3, and K2 (1-3) indicating these exhibits originated from a common source. Likewise, a similar pattern of "trash marks" was noted on Exhibits Q2 and K1 (1-3) indicating these exhibits originated from a common source.
	Video Spectral Comparator (VSC)	Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) were examined visually, and with infrared, infrared luminescent, ultraviolet, and transmitted light sources and no differences were noted in the paper.
	Digital scan	All exhibits including the ESDA indentation lifts were digitally scanned.
LLA8TA	ESDA	Bands that may be attributable to the machine's paper transport mechanism were visualized on Q1, Q3, and on samples from K2. These bands were not visualized on Q2 or the samples from K1.
	Visual Examination	Voids in the form of horizontal bands in the printed material were visible on Q2 but not on Q1 or Q3.
	Overlays	Q1, Q3, and the samples from K2 contain marks or defects present in the same pattern and on the same location. Q2 does not have this same pattern but does have print marks or defects in the same pattern and in the same location as the samples from K1.
	Oblique Light	Horizontal creases or indentations in the paper's surface could be seen on Q1, Q3, and the samples from K2. These creases were absent on Q2 and on the samples from K1.
	Microscopic Examination	Q1, Q3, and the samples from K2 were printed via a toner process. Q2 and the samples from K1 were printed via a color inkjet process. The marks or defects present on the samples from K1 contained voids in the form of horizontal bands, similar to the voids seen on Q2 upon visual examination.
	Microscopic Examination	The toner printing on Q3 was a bit lighter in some areas. It is not possible to determine if this may have been due to print quality, machine settings, or the use of a different machine at one time to produce a previous version of the document. Additionally, fibers or debris were present in the toner printing on Q1, Q3, and K2.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	All Q and all submitted K contained luminescent fibers when viewed under alternate light sources. The toner printed material did not transmit light under IR illumination but the color inkjet printed material did transmit light under IR illumination.
	Transmitted Light	None of the submitted documents contained a watermark.
	Overlays	No association was observed between the marks or defect patterns on K1 or K2. An association was observed between the marks or defect pattern on Q1 and Q3 but not on Q2.
	Ruler	All submitted documents measured approximately 8.5" x 11".
	Microscopic Examination	All submitted documents were microscopically examined for evidence of multiple print processes. No evidence of multiple print processes on a single document were observed.
LP7ZHX	Microscopic Examination	Microscopic appearance identifies (1) samples in K2 and the copies Q1 and Q3 as being produced by the plain-paper, dry-toner, electro-photographic process; and (2) samples in K1 and the copy Q2 as being produced by the colour inkjet process.
	Oblique Light	No sign of indented handwriting in any of K or Q documents but indented irregular lines, parallel to short edge, seen in K2, Q1, and Q3.
	Overlays	Photocopy Transparencies. Overlaying on documents shows close similarity of defect marks in (1) K2, Q1, and Q3; and in (2) K1 and Q2, respectively.
	ESDA	No sign of indented handwriting in any of the Q documents; the irregular indented lines in Q1 and Q3, seen by oblique light, did not image.
LP9LDD	Visual Examination	Q1 and Q3 had a distinctive and unique pattern of photocopy trash marks which matched in pattern the trash marks seen on the specimen copies from copier K2. Q2 had a distinctive and unique pattern of photocopy trash marks which matched in pattern the trash marks seen on the specimen copies from copier K1.
	Overlays	Q1 and Q3 had a distinctive and unique pattern of photocopy trash marks which matched in pattern the trash marks seen on the specimen copies from copier K2. Q2 had a distinctive and unique pattern of photocopy trash marks which matched in pattern the trash marks seen on the specimen copies from copier K1.
	Microscopic Examination	Q2 and K1 have been produced by a colour inkjet process – most likely by a colour inkjet copier or multifunction device. Q1, Q3 and K2 have been produced by a toner process – most likely a laser copier.
LP9X7V	Microscopic Examination	Microscopic examination of printing processes, paper, trash marks.
	Oblique Light	Indentations, excess printing markings
	Video Spectral Comparator (VSC)	Indentations, paper examination, printing process
	ESDA	Indentations.
	Visual Examination	Paper, printing, texture, paper thickness.
	Micrometer	Paper thickness.
	Transmitted Light	Watermarks

TABLE 2

WebCode	Methods/Techniques	Observations
LUGLGB	Video Spectral Comparator (VSC)	1. The background toner markings on the exemplar marked "K1" and on the questioned note marked "Q2" are similar in shape, size and position. 2. The background toner markings on the exemplar marked "K2" and the two questioned notes marked "Q1" and "Q3" are similar in shape, size and position.
	Oblique Light	1. There are indentation and embossed marks that originated from the unique features of the photocopier. These marks are similar on the exemplar marked "K2" and on the two questioned notes marked "Q1" and "Q3"
	Physical match and superimposing documents using transparent papers	1. The marks on the transparent copy of the exemplar "K1" and that of "Q2" were similar and matching. 2. The marks on the transparent copy of the exemplar "K2" and that of "Q1" and "Q3" were similar and matching. 3. The marks on the transparent copy of the exemplar "K1" and that of "Q1" and "Q3" were not similar and not matching. 4. The marks on the transparent copy of the exemplar "K2" and that of "Q2" were not similar and not matching.
M3BCVC	Transmitted Light	Numerous common copier marks on Q-1 and Q-3 to K-2 and Q-2 to K-1.
	Transparencies	Numerous common copier marks on Q-1 and Q-3 to K-2 and Q-2 to K-1
M7BKYM	Visual Examination	Visual examination in conjunction with oblique light and with overlays. Note the machine marks on Q1, Q3, and K2 which are in alignment. Trash marks are in agreement in shapes and placements.
	Oblique Light	See Visual Examination
	Microscopic Examination	Determine mode of printing. Toner for Q1, Q3, and K2. Inkjet for Q2 and K1. Careful examination of shapes of trash marks.
	Overlays	See Visual Examination
	ESDA	Visualization of machine marks
N47EY8	Visual Examination	Shapes and locations of printing defects
	Microscopic Examination	printing method
	Macroscopic Examination	Shapes and locations of printing defects
	Overlays	Shapes and locations of printing defects
	VSC6000	Shapes and locations of printing defects
NHYJB4	Microscopic Examination	To check for the defects marks on the exhibits documents.
	Video Spectral Comparator (VSC)	To check for the defects marks on the exhibits documents. Superimposed the marks to check if they are identical from both the sample and exemplar documents
NK7Z6T	Video Spectral Comparator (VSC)	The questioned notes marked 'Q1' and 'Q3' were each superimposed on the exemplar marked 'K2' where the markings on the notes are identical. The markings on each document 'Q1' and 'Q3' have identical patterns and shapes with the exemplar 'K2' and are placed at the exact positions.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	The questioned note marked 'Q2' was superimposed on the exemplar marked 'K1' where the markings on the notes are identical. The markings on document 'Q2' have identical patterns and shapes with the exemplar 'K1' and are placed at the exact positions.
NKPELW	[No Methods Reported.]	
NLLNXL	Overlays	The trash marks/defects observed on Exhibits 1 and 3 (CTS Exhibits Q1 and Q3) correspond to the trash marks/defects observed on Exhibits 5(1-3) (CTS Exhibit K2). The trash marks/defects observed on Exhibit 2 (CTS Exhibit Q2) correspond to the trash marks/defects observed on Exhibits 4(1-3) (CTS Exhibit K1).
	Ultraviolet Light	No differences were detected/observed in the fluorescent properties of Exhibits 1-5 (CTS Exhibits Q1-Q3 and K1-K2).
	Macroscopic/Microscopic Examination	Exhibits 1, 3, and 5(1-3) (CTS Exhibits Q1, Q3 and K2) were produced using toner (black). Exhibit 2 and Exhibits 4(1-3) (CTS Exhibits Q2 and K1) were produced using ink jet technology (CYMK).
	Micrometer	No differences were detected/observed in the paper thickness of Exhibits 1-5 (CTS Exhibits Q1-Q3 and K1-K2).
	Oblique Light	Examination of Exhibits 1-5 (CTS Exhibits Q1-Q3, K1 and K2) using side lighting disclosed indentations/impressions in approximately the same location on Exhibits 1, 3 and 5(1-3) (CTS Exhibits Q1, Q3 and K2). The indentations/impressions may be an artifact of the paper feed/transfer mechanism(s) within the printer(s)/copier(s) used to produce Exhibits 1, 3 and 5(1-3). No indentations/impressions were observed on Exhibits 2 and 4(1-3) (CTS Exhibits Q2 and K1).
NQGDJZ	Overlays	Match the printing satellites in Q1, Q3 and K2. Match the printing satellites in Q2 and K1.
	Video Spectral Comparator (VSC)	Match the pattern of printing marks in Q1, Q3 and K2. No pattern of printing marks is observed in Q2 and K1.
	Análisis del sistema de impresión (tintas)	Q1, Q3 and K2 present laser printing system. Q2 and K1 present inkjet printing system.
NQVFL	Microscopic Examination	After an analysis and comparison, the following observations were made: 1 Pertaining to the documents marked "Q1" and "K2": 1.1 The trash marks on documents marked "Q1" are similar in shape and placement to those found on the document marked "K2". 1.2 The documents are printed by a "lazer printer". 2 Pertaining to the documents marked "Q2" and "K1": 2.1 The trash marks on documents marked "Q2" are similar in shape and placement to those found on the document marked "K1". 2.2 The documents are printed by an "inkjet printer". 3 Pertaining to the documents marked "Q3" and "K2": 3.1 The trash marks on documents marked "Q3" are similar in shape and placement to those found on the document marked "K2". 3.2 The documents are printed by a "lazer printer".
P2AFXD	Visual Examination	Trashmarks identified on all documents - both specimen and questioned. K1 & Q2 share common trashmarks. K2, Q1 & Q3 share common trashmarks
	Microscopic Examination	Printing process identification: K1 = inkjet printing process (4-colour). K2 = toner printing process (black). Q1 & Q3 = toner printing process (black). Q2 = inkjet printing process (4-colour)

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	Indentation examination of all documents - specimen and questioned. K1 = no significant indentations detected (only faint markings). K2 = indentations appearing to be from printer/roller marks on both front and reverse of documents. Q1 & Q3 = similar indentations as those found on K2 samples, from what appear to be printer/roller marks on both front and reverse Q2 = No significant indentations detected (only faint markings)
PCQ6WJ	Macroscopic Examination	Q1, Q2, and Q3 give the appearance of documents produced by physically cutting words and letters from other documents (e.g., magazines) and taping or pasting them to a sheet of paper (the backing), hereinafter referred to as "Type 1" documents, and then being copied to produce the final document. It is also possible to create documents that mimic the appearance of Type 1 using various software programs (e.g., Microsoft Word), hereinafter referred to as "Type 2" documents. When Type 1 documents are copied, there will often be a shadow line along one edge of the copy of the piece of paper attached to the backing. This does not occur on Type 2 documents unless the shadow is specifically mimicked. I did not observe any shadow lines on Q1, Q2, and Q3. The absence of shadow lines suggests that documents Q1, Q2, and Q3 may have been initially produced as Type 2 documents. Numerous "trash marks" are on Q1 and Q3 that are consistent between the two documents. The marks are also consistent with the trash marks on K2.1-K2.3. Numerous trash marks are on Q2 that are consistent with the trash marks on K1.1-K1.3.
	Microscopic Examination	Q1, Q3, and K2.1-K2.3 were produced by a machine(s) using black electrostatic toner (monochromatic). No differences were observed in the toner morphology between the questioned and known documents. No microscopic evidence was found to suggest that these documents were made on different machines. Q2 and K1.1-K1.3 were produced by an inkjet printer using black, magenta, cyan, and yellow ink. No microscopic evidence was found to suggest that these documents were made on different machines. Q2 was made on a different machine from that which made Q1 and Q3.
	Oblique Light	Horizontal indentations, which cross the entirety of the documents, were observed on both Q1 and Q3 as well as K2.1 through K2.3. The indentations are consistent in position between the questioned and known documents. These indentations were not developed or not developed well on the ESDA lifts. These indentations are consistent with having been produced by the document transport system of the machine(s) (e.g., wheel, band, or roller marks) that produced the documents. Indented handwriting was not observed.
	ESDA	ESDA examinations were conducted on Items Q1, Q2, Q3, K1.1 and K2.1. Features related to document transport system of the machines that produced the documents (e.g., wheel, band, or roller marks), which were consistent between the questioned and known documents, were developed on Q1, Q3, and K2.1. More notes regarding these marks are on copies of the ESDA lifts. Indented handwriting was not detected on any of the documents.
	Ultraviolet Light	All the submitted documents were examined with a ultraviolet light lamp. No differences were observed in the paper.
PQBHDY	Microscopic Examination	Q1, Q3, K2 were produced using black, laser jet technique. Q2 and K1 were produced using colourful ink-jet technique.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	Trash marks examined and overlaid with MIX mode. Three blank exemplars designed by K1 have the same pattern of impurities. Three blank exemplars designed by K2 have the same pattern of impurities. The pattern of impurities on Q1 and Q3 matches K2. The pattern of impurities on Q2 matches K1.
	Oblique Light	Similar transport/roller mark mechanism impressions were observed on K2, Q1 and Q3.
	ESDA	Similar transport/roller mark mechanism impressions were observed on K2, Q1 and Q3.
PQCWNT	Visual Examination	Magnification and flood lighting for visual examination and comparison of visible defects for appearance, size and placement in relation of each document.
	Microscopic Examination	Magnification and flood lighting for visual examination and comparison of visible defects for appearance, size and placement in relation of each document.
	Video Spectral Comparator (VSC)	Measurement (using ruler function) of visible defects for placement in relation of each document.
PUCZH2	Video Spectral Comparator (VSC)	Flood light-The questioned note marked "Q1" has the same identified marks as the exemplars marked "K2", when superimposed.
	Video Spectral Comparator (VSC)	Flood light-The questioned note marked "Q2" has the same identified marks as the exemplars marked "K1", when superimposed.
	Video Spectral Comparator (VSC)	Flood light-The questioned note marked "Q3" has the same identified marks as the exemplars marked "K2", when superimposed.
PV6GMN	Microscopic Examination	Microscopic examination of print process. K1 and Q2 similar colour ink jet printing, also displaying printing defect in Q2.
	Microscopic Examination	Microscopic examination of print process. K2 and Q1 & Q3 similar black & white laser (toner) printing.
	Visual Examination	Visual examination (trash marks). Printed marks observed in the non-image areas of documents in Items Q1 - Q3.
	Visual Examination	Visual examination (trash marks). Printed marks observed in the non-image areas of documents in Items K1 and K2.
	Transmitted Light	Comparison/transmitted light overlay. K1 and Q2 consistent trash marks in same relative position likely from glass plate.
	Transmitted Light	Comparison/transmitted light overlay. K2 and Q1 & Q3 consistent trash marks in same relative position likely from glass plate
	ESDA	ESDA. K1 and Q2 no significant impressions developed.
	ESDA	ESDA. K2 and Q1 & Q3 impressions of horizontal roller marks in same relative position.
PX9ALT	Visual Examination	
	Video Spectral Comparator (VSC)	
	Microscopic Examination	
Q2MJGQ	Oblique Light	Observed impression/indentation lines on Items 1 (Q1), 3 (Q3), 5 (K2). Possible defect.

TABLE 2

WebCode	Methods/Techniques	Observations
	Transmitted Light	All paper, negative watermarks.
	ESDA	No indented writing observed on Items 1 (Q1), 2 (Q2), 3 (Q3).
	Video Spectral Comparator (VSC)	Observed impression/indentation lines on Items 1 (Q1), 3 (Q3), 5 (K2). Possible defect.
	Overlays	Observed positioning/morphology of toner and ink jet trashmarks on all items.
	Microscopic Examination	Observed toner printing: Items 1 (Q1), 3 (Q3), 5 (K2) and Ink jet printing: Items 2 (Q2), 4 (K1).
Q3MAFY	Visual Examination to identify unique marks (trash marks)	same unique marks were observed between questioned notes "Q1" and "Q3" with specimen documents "K2". same unique marks were observed between questioned note "Q2" with specimen documents "K1". different unique marks were observed between questioned notes "Q1" and "Q3" with specimen documents "K1". different unique marks were observed between questioned note "Q2" with specimen documents "K2".
	Transparency overlay and comparison of trash marks	the trashmarks from the questioned notes "Q1" and "Q3" were compared to the corresponding position of trashmarks from specimen documents "K2" and found that the trashmarks from questioned notes corresponded in design and position with specimens. the trashmarks from the questioned note "Q2" were compared to the corresponding position of trashmarks from specimen documents "K1" and found that the trashmarks from questioned note corresponded in design and position with specimens. the trashmarks from the questioned notes "Q1" and "Q3" were compared to the position of trashmarks from the specimen documents "K1" and found that the trashmarks from questioned notes did not correspond in design and position with specimens. the trashmarks from the questioned note "Q2" were compared to the position of trashmarks from the specimen documents "K2" and found that the trashmarks from questioned notes did not correspond in design and position with specimens.
QD4WPZ	Microscopy	Q1 and Q3 are produced by laser printer. Q2 is produced by ink-jet printer. Samples from K2 are produced by laser printer. Samples from K1 are produced by ink-jet printer.
	Measurement	Identical mark patterns were found between Q1/Q3 and K2, and between Q2 and K1.
QDHZ3L	Microscopic Examination	TO DETERMINE IF THE INK SMUDGES ON QUESTIONED NOTES (Q1, Q2, Q3) CORRISPONDS/ OR ARE IN THE SAME POSITION WITH THOSE (INK SMUDGES) ON BLANK EXAMPLARS MARKED K1 AND K2.
	Visual Examination	
QFAQER	Macroscopic Examination	Visually noted that items were copies and contained numerous extraneous markings.
	Microscopic Examination	Observed printing processes and extraneous markings.
	Oblique Light	examined for indented writing; indentation lines observed on items 1, 3, and 5 - possible defect on printer rollers
	ESDA	examined for indented writing
	Photoshop	Used to demonstrate findings (location, shape, and size of corresponding extraneous markings)

TABLE 2

WebCode	Methods/Techniques	Observations
QNYAEY	Visual Examination	It was checked that the three blank exemplars produced by Kodak ESP Office 2170 printer (K1), showed the same inkjet printing characteristics (color & black) that were exactly reproduced on Q2 note rotated 180 degrees. Equally, the three blank exemplars produced by Canon Image Runner 3225 printer (K2) showed the same toner black marks that were exactly reproduced on Q1 & Q3 notes, also rotated 180 degrees. On the three K2 evidences and Q1 & Q3 notes, it can be distinguished mainly two horizontal marks in just the same position.
	Microscopic Examination	There aren't differences regarding black toner characteristics between K2 toner and Q1 & Q3 toners. There aren't also, any difference regarding ink drops properties of the inkjet printers between K1 & Q2.
	ESDA	Any other significant marks can't be found.
	Video Spectral Comparator (VSC)	Any other significant marks can't be found.
QNZCH6	Video Spectral Comparator (VSC)	Foster VSC8000 video spectral comparator + Freeman, which allows juxtapositions, collated documents overlap and the use of special lighting as it is transmitted light
	Macroscopic/Microscopic Examination	Nikon SMZ1500 stereo microscope with digital camera for detailed observation of the physical characteristics; He holds each of the motive of study documents
	Magnification	Portable magnifiers, allows to reveal details of the documents face
R877P2	Video Spectral Comparator (VSC)	The patterns, marks and defects found on the document marked "Q1" are the same as patterns, marks and defects on the document marked "K2"
	Video Spectral Comparator (VSC)	The patterns, marks and defects found on the document marked "Q2" are the same as patterns, marks and defects on the document marked "K1".
	Video Spectral Comparator (VSC)	The patterns, marks and defects found on the document marked "Q3" are the same as patterns, marks and defects on the document marked "K2".
RBMVN6	Video Spectral Comparator (VSC)	With the use of the video of the spectral comparator, the physical examination of the folded printed documents (Q1, Q2 and Q3) and undoubted (K1 and K2) was carried out, where by means of the application of superimposed light and incidental light with optical focus, established Identifying characteristics between the questioned document (Q2) with the indubitable document (k1), and the documents questioned ((Q1 and Q3) with the indubitable document (K2), with respect to the topographical distribution of the particular characteristics and the form of the particularities.
	Visual Examination	I made a preliminary assessment of the doubted and undoubted materials, regarding the suitability requirements, in which it was established that they are suitable for study and technical comparison.
	Magnification	With the use of the video of the spectral comparator, the physical examination of the folded printed documents (Q1, Q2 and Q3) and undoubted (K1 and K2) was carried out, where by means of the application of superimposed light and incidental light with optical focus, established Identifying characteristics between the questioned document (Q2) with the indubitable document (k1), and the documents questioned ((Q1 and Q3) with the indubitable document (K2), with respect to the topographical distribution of the particular characteristics and the form of the particularities.

TABLE 2

WebCode	Methods/Techniques	Observations
RDX2JY	Macroscopic Examination	Q1/Q3 have visually similar class characteristics for paper and toner (printing). Extensive trash marks observed on each item consistent with marks/damage/dirt/etc on, or to, the platen of the device. Q1/Q3/K2 display a very different set of trash marks than Q2/K1.
	Overlays	Transparent overlays of each K with Q items showed complete correspondence of trash marks on K2 with Q1/Q3, as well as complete correspondence of trash marks on K1 with Q2.
	Oblique Light	Visible lines of indentations on Q1/Q3/K2 (best viewed from reverse) consisting of 3 sets of markings across width of page at consistent locations, with each 'line' comprised of several, repeated and narrow indentations. These are possibly relating to the device transport mechanism. No indentations observed on Q2/K1.
	Microscopic Examination	General examination of toner type (black dry toner for Q1/Q3/K2, 4-colour dry toner for Q2/K1), particle size, deposition, printing defects, and fusing characteristics. No CPS codes observed on either item.
	Regula Magmouse	Q1/Q3 toner is magnetic (monocomponent) as is the toner on K2. Q2/K1 toner is non-magnetic.
RLVURT	Visual Examination	Trash marks observed on K1 (K1A-K1C), K2 (K2A-K2C), Q1, Q2 and Q3. Indented impressions observed on K2 (K2A-K2C), Q1 and Q3. Photocopier comparison: Sufficient class and individual characteristics are present to determine that the documents Q1 and Q3 were produced by the same machine as K2 (K2A-K2C). Sufficient class and individual characteristics are present to determine that the documents Q2 was produced by the same machine as K1 (K1A-K1C).
	Microscopic Examination	Non-Impact Print Process: K1 (K1A-K1C) and Q2 - color inkjet, K2 (K2A-K2C), Q1 and Q3 - black dry toner.
	Oblique Light	Indented impressions observed on Q1 Back, Q3 Back and K2 (K2A-K2C).
	ESDA	Indented impressions observed (positive of value) on Q1 Back, Q3 Back and K2 (K2A-K2C) Back. Indented impressions observed (positive no value) on Q1 Front, Q3 Front, K1 (K1A-K1C) Front and Back and K2 (K2A-K2C) front.
	Digital Imaging	For documentation purposes only.
RU66YY	Visual Examination	Having conduct a macroscopic comparison of document k1 to Q2, IT WAS DETERMINATED THAT DEFECTS OR MARKS OF IMPRESSION ON THE SUPPORT HAVE SIMILAR DISTRIBUTION AND SIZE. UPON THE MACROSCOPIC COMPARISON OF DOCUMENT K2 TO Q1 AND Q3, IT WAS DETERMINATED THAT THE DEFECTS OR MARKS OF IMPRESION ON THE SUPPORT HAVE SIMILIAR DISTRIBUTION.
	Macroscopic Examination	UPON THE MICROSCOPIC COMPARISON OF DOCUMENT K1 TO Q2, THE DEFECTS OR MARKS OF IMPRESSIONS HAVE SIMILAR SHAPES. UPON HOLDING THE DOCUMENTS TO LIGHT, THE MARKS OR DEFECTS COINCIDE IN LOCATION, AND WHEN OVERLAYING THA MARKS, THE DEFECTS OR MARKS COINCIDE IN SHAPES AND SIZES.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	THE DEFECTS OR MARKS OF IMPRESSION HAVE SIMILAR SIZES. UPON THE MICROSCOPIC COMPARASION OF DOCUMNET K2 TO DOCUMENTS Q1 AND Q3, IT WAS DETERMINED THAT THE DEFECTS OR MARKS OF IMPRESION HAVE SIMILAR SHAPES. UPON HOLDING THE DOCUMENTS TO LIGHT, THE MARKS OR DEFECTS COINCIDE IN LOCATION AND SHAPE. UPON OVERLAYING THE DEFECTS OR MARKS COINCIDE IN SHAPE AND SIZE.
RWQ3BV	Magnification	Magnification was used to determine the shape formation of the toner satellites present on the Q's and K's.
	Overlays	Overlays were used to determine how well the trash marks on the Q's conformed to those on the K's.
RXJ34Z	Macroscopic Examination	Q1, Q3 note, and K2 exemplars have the same trash marks position but Q3 image is upside down compared to Q1 and K2 image. Q2 note and K1 exemplars have the same trash marks position. Q2 note has line defects from inkjet printhead.
	Magnification	After using the 50x magnification - Q1, Q3 note, and K2 exemplars have toner particles scattered around the perimeter of each image areas and the printing is on top of each paper surface. They were produced by toner printing process. Q2 note and K1 exemplars have feathering feature due to ink bleeding and ink are absorbed into paper fiber. They were produced by inkjet printing process.
	Oblique Light	Q1, Q3 note and K2 exemplars have the same crease position.
T4LCBT	Visual Examination	We match the toner traces between questioned documents and (k) papers under different techniques.
	Ultraviolet Light	
	Microscopic Examination	
	Transmitted Light	
T7AVZX	Visual Examination	Overall appearance of macroscopic features including defects on page.
	Microscopic Examination	With stereomicroscope, Appearance of printed entries; Q1, Q3 and K2 dry black toner, Q2 and K1 ink-jet (CMYK). Visualise the shape, appearance and morphology of defects.
	Oblique Light	Optical viewing and recording of paper handling markings on all questioned and known documents. No indentations from handwriting observed. All results recorded with camera on copy stand.
	Indented Writing	Electrostatic Detection Device (EDD) used to detect, develop and record impressions of all pages, the front and reverse sides. Indented impressions observed from paper handling equipment. No indentations from handwriting observed.
	Radiography	Disclosed denser materials for toner, inorganic materials likely for documents Q1, Q3 and K2.
	Magnetic detector (Regula MagMouse)	Used for qualitative detection of magnetic materials for toner Q1, Q2 and K2.

TABLE 2

WebCode	Methods/Techniques	Observations
	Transmitted Light	To assist in the determination whether spatially static defects were in common between documents. Congruence in spatially static defects (trash marks) between Q2 and K1 were observed. Congruence in spatially static defects (trash marks) between Q1, Q3 and K2 were observed.
	Overlays	Overlays of documents with transmitted light and Photoshop. Congruence in spatially static defects (trash marks) between Q2 and K1 were observed. Congruence in spatially static defects (trash marks) between Q1, Q3 and K2 were observed. K1 and K2 had different spatially static defects (trash marks).
	Websites for manuals and specifications of office machines used to produce K1 and K2.	Technical specifications of these devices. K1 office machine produced documents verified that it is a multi-function ink-jet device. K2 office machine produced documents verified that it is an electrophotography (toner based) device.
	Photoshop software	Scanned documents to permit overlay of defects similar to what was done for transmitted light.
TLADCQ	Microscopic Examination Video Spectral Comparator (VSC) Visual Examination	
TPNBGR	Visual Examination Oblique Light Microscopic Examination ESDA Digital Imaging Overlays	Visually: To examine the substrate/paper documents to determine the paper size, color presence or not of watermarks. Also in general, utilizing the UV light box indicates similar optical properties of all papers. Side Lighting / oblique lighting allows visualization of the presence or lack of indentations on all of the Q's and K's. Visually: enables the examiner to determine the print processes on all the Q's and K's. ESDA lifts may provide/show areas of indentations on the documents in both the questioned documents and known documents. All documents were scanned into Foray for future reference and if needed to provide court charts if testimony is needed. Transparencies (overlays) allow reproduction of all trash marks and placement of the know documents onto the questioned documents. This allows the overlapping of trash marks of the Q's and K's in any orientation (up and down or in reverse-- down and up).
TZJ3TJ	Microscopic Examination Microscopic Examination	Q1, Q2, Q3 and K1 and K2 were analysed using a microscope. The words that appeared on the notes of Q1, Q2 and Q3 were cut and paste randomly and were of different sizes and fonts. Q1 displayed machine characteristics such as bold singular dots, clusters of smaller dots in random patterns, lines and smudges possibly produced by marks and scratches on the photocopier's screen are spread across the paper. A noticeable amount of characteristics are clustered toward the top, right hand side of the paper Q2 displayed machine characteristics such as bold "v" shaped features, lines, dots and faint smudges possibly produced by marks and scratches on the photocopier's screen are spread across the paper. The characteristics appear scattered around the edges of paper with few appearing in the centre. Q3 displayed similar machine characteristics to Q1

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	K1 displayed machine characteristics such as bold "v" shaped features, lines, dots and faint smudges possibly produced by marks and scratches on the photocopier's screen are spread across the paper. The characteristics appear scattered around the edges of paper with few appearing in the centre. K2 displayed machine characteristics such as bold singular dots, clusters of smaller dots in random patterns, lines and smudges possibly as a result of marks and scratches on the photocopier's screen are spread across the paper. A noticeable amount of characteristics are clustered toward the top, right hand side of the paper;
U8K6JH	Video Spectral Comparator (VSC)	Corresponding marks were observed on specimen document "K2" and the questioned documents "Q1" and "Q3". Corresponding marks were observed on specimen document "K1" and the questioned document "Q2".
	Microscopic Examination	Different printing methods were identified between the two sets of specimen and the questioned document.
	Overlays	Copies of both sets of specimen were made using transparencies. When the transparencies were placed on questioned documents correspondences were identified.
UG8Y27	Microscopic Examination	Printing process examination - determined the methods of production Q1, Q3, K2 – were produced using an electrostatic process with black toner. Q2, K1 – were produced using a colour inkjet technique (CMYK).
	Video Spectral Comparator (VSC)	Comparison techniques (VSC 8000 - visible, UV, IR absorbance, IR luminescence). The colour inks (Magenta, Cyan, Yellow, Black) of Q2 and K1 printouts have the same optical properties. The optical properties of Q1, Q3 i K2 toners are the same.
	Microscopic Examination	The surface of toner layers of printouts of Q1, Q3 and K2 exhibit similar optical properties.
	Video Spectral Comparator (VSC)	Indentations in paper (VSC 8000 - oblique light). No discernible markings or impressions were observed on Q2 nor K1. The same distinctive patterns of indentations caused probably by transport mechanism of printing device were observed on Q1, Q3 and K2.
	Superposition techniques	VSC 8000 and Adobe Photoshop. The same position of matching trash marks (about 16 marks) observed on both Q2 and K1. Also characteristic patterns of matching trash marks (about 29 marks) on Q1, Q3 and K2.
	Microscopic Examination	The detailed shape of each inkjet trash mark on Q2 and K1 were comparable. The shape of toner trash marks on Q1, Q3 and K2 were similar as well.
UL2ZWT	Visual Examination	Noted trash marks on Q1-Q3
	Microscopic Examination	Observed shapes, measured sizes.
	Overlays	Made transparency overlays of of Q and matched the with locations of marks on the K specimens.
UNR23G	Visual Examination	Visually inspect the documents to identify the presence, if any, of incidental marks. On copies of the exemplars and documents in question, highlight the incidental marks for comparison purposes.
	Microscopic Examination	To determine the nature and extent (size, form etc) of the incidental marks identified on the exemplars and documents in question (i.e. mechanically produced by, for example, the rolls or drum of the copier)

TABLE 2

WebCode	Methods/Techniques	Observations
	Transmitted Light	Determining whether or not the incidental marks on both the exemplars and documents in question occur in the same or identical location and position.
UP3DWY	Video Spectral Comparator (VSC)	The exhibits marked "Q1" and "Q3", were superimposed on the exemplar marked "K2", wherein the background markings of both the papers are identical: they have the same pattern and shape respectively and are placed at the exact position.
	Video Spectral Comparator (VSC)	The exhibit marked "Q2, were superimposed on the exemplar marked "K1", wherein the background markings of both the papers are identical: they have the same pattern and shape respectively and are placed at the exact position
UPJRY3	Visual Examination	See the ink patterns that are left in the different documents
	Transmitted Light	With the samples of the classroom and library use transmitted light to show same characteristics in the blank examples and the anonymous notes
	Overlays	Find the same ink patterns in blank examples and anonymous notes
UTNLB8	Microscopic Examination	Q1, Q3 and K2 samples black electrostatic toner. Q2 and K1 samples colour inkjet.
	Magnetic Ink profiler	Toner on Q1, Q3 and K2 samples has ferrous component.
	Overlays	Q1, Q3 and K2 samples have common scanner platen marks. Q2 and K1 samples have common scanner platen marks.
	ESDA	Q1, Q3 and K2 samples have common roller mark patterns. Q2 and K1 samples have common roller mark patterns.
VA6793	Oblique Light	Q1, Q3, and K2 - possible roller marks horizontally across the pages. Negative results for Q2 and K1.
	ESDA	Negative results.
	Overlays	Using transparency overlays, numerous toner defects that are in exact alignment were noted in Q1, Q3, and K2. Different defects, in inkjet, in different locations than those noted above, but also in exact alignment, were noted in Q2 and K1.
	Microscopic Examination	Black toner defects noted on Q1, Q3, and K2. Four color inkjet defects noted on Q2 and K1.
	Ultraviolet Light	No spectral differences noted between paper of items Q1, Q2, Q3, K1, and K2.
VFB6G8	Visual Examination	K2, Q1 and Q3 sheets of paper present a slight fold line. Q1, Q3 and K2 have the same trash marks: same shape and same spread. Q2 and K1 have the same trash marks: same shape and same spread.
	ESDA	No indented writing or marks on K1 and Q2; Therefore, electrostatic detection on Q1, Q3 et K2's front page (impressions), reveals a central strip: indented mark from transport or fusion mechanisms from copier.
	Microscopic Examination	Same printing technology for texts and trash marks on K1 and Q2: inkjet (four-colour mode). Same printing technology for texts and trash marks on K2, Q1 and Q3: laser printer
	magnetic detection	Q1 et Q3 printed with black magnetic toner. this examination can't be achieve on K2 because of the small amount of toner

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	Under white, transmitted and UV lights K1, K2, Q1, Q2 and Q3 sheets of paper have the same aspect; same dimensions.
VTXMGK	Microscopic Examination	Determined printing process. Inkjet/black toner
	Video Spectral Comparator (VSC)	Determined printing process. Inkjet/black toner
	Indented Writing	Negative for indented writing although roller/gripper marks noted.
	Transmitted Light	Watermark evaluation negative.
	Overlays	Used to determine constellations of excess toner corresponded between documents.
VX8DRY	Microscopic Examination	office machine copier "trash marks"
	Transmitted Light	alignment of marks
	Overlays	alignment of marks
W4TH97	ESDA	Nothing observed
	Oblique Light	Transversal marks compatible with roller marks same places on the sheet for Q1/Q3/K2
	Visual Examination	General comparison of markings, papers. No differences of paper whiteness
	Macroscopic/Microscopic Examination	Comparison of trash marks: Printing processes: Q1/Q3/K2 laser, same toner appearances, monochrome. Q2/K1 inkjet quadrichrome + Black, same appearances of inklets. Paper comparison: no differences on all papers
	Overlays	Trash marks of Q1/Q3/K2 compatible. Trash marks of Q2/K1 compatible
	Transmitted Light	Same paper composition for all sheets
	Video Spectral Comparator (VSC)	Complete comparison (UV, Infrared, etc.) no differentiation between papers.
W8ABWD	Microscopic Examination	Microscopic examination of the Q and K's revealed the presence of black toner and color toner. Also noted were trash marks appearing on the documents.
	Overlays	Made transparency of K's and overlaid them over the Q's and noted some corresponding trash marks that along with the same toner allowed for conclusions that were made.
WLTAW8	Video Spectral Comparator (VSC)	Under Flood light and magnification there were marks/dots on both known copies (item K1 & K2) and questioned notes (items Q1, Q2 & Q3) that appear to have the same pattern
WLWRWR	VSC 6000- Flood light	Marks were examined on all documents. The marks on "K1" match with the ones on "Q2". The marks are located on the same position of the documents. The marks on the document "K2" appear on the same way as on the document "Q1" & "Q3" and The marks appear on the same location of the documents.

TABLE 2

WebCode	Methods/Techniques	Observations
	photocopy machine -Transparencies	Transparencies were used to superimpose with the documents , "k1" was superimposed with "Q2" and the marks matched on both documents. "K2" was superimposed with "Q1" & "Q3" and the marks on both documents matched.
WNGCQE	Video Spectral Comparator (VSC)	Marks that were observed on specimen document "K2" corresponded with the marks on the questioned documents "Q1" and "Q3". Marks that were observed on specimen document "K1" corresponded with the marks on the question document "Q2".
	Microscopic Examination	Microscopic examination was done to identify the different printing methods between the two sets of specimen and the questioned document.
	Overlays	Transparencies of the sample items were used as overlays in order to determine if the trash marks on both sets of documents correspond.
WPK6Q	Visual Examination	Detailed observation of the characteristics of the document through the use of adjustable, straight flush and oblique episcopic illumination to analyze traces that show characteristic points on the surface of the sheet. Determination of characteristics of print seen on the surface of each of the questioned leaves (Q1, Q2 and Q3) and samples (K1 and K2), that allow to establish the possible uniprocedent of their printed characteristic points.
	Video Spectral Comparator (VSC)	Analysis macro and micro, describing aspects of general and particular disputed brackets and disputed; using the VSC6000HS, with lighting by transparency overlaying sheets to detect perfect matches between the fuzzy images that can be seen on the surface of them and establish the possible uniprocedent the source that produced it.
WPW3TR	Video Spectral Comparator (VSC)	THE DEFECTS (MARKS) THAT ARE APPEARING ON THE NOTE MARKED AS "Q1" ALSO APPEAR ON THE EXEMPLAR COPIES MARKED AS "K2"
	Video Spectral Comparator (VSC)	THE DEFECTS (MARKS) THAT ARE APPEARING ON THE NOTE MARKED AS "Q2" ALSO APPEAR ON THE EXEMPLAR COPIES MARKED AS "K1"
	Video Spectral Comparator (VSC)	THE DEFECTS (MARKS) THAT ARE APPEARING ON THE NOTE MARKED AS "Q3" ALSO APPEAR ON THE EXEMPLAR COPIES MARKED AS "K2"
WTENT7	Transmitted Light	Similar positioning of trash marks.
	ESDA	Similar roller marks
	Magnification	Similar appearance of trash marks.
WVHGNQ	Visual Examination	Deductive method: observation, description, comparison and judgment.
	Macroscopic/Microscopic Examination	
WWBP2V	konika minolta photocopy machine	identification marks
	Microscopic Examination	identification marks
	Visual Examination	
XM23JZ	Visual Examination	Viewing without any aid revealed that the Q1 and Q3 items were prepared with the Exhibit K2 photocopier and the Q-2 item was prepared with the K1 photocopier.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	As information the Exhibit K1 items were produced with full color ink jet technology and the Exhibit K2 items were produced with a black and white dry toner process.
	Indented Writing	No evidence of significant indented writing was noted on the Exhibit Q1 through Q3 items.
	Ultraviolet Light	Q-1 through Q-3 items are optically consistent under white and UV lights.
	Thickness	The Exhibit Q-1 through Q-3 items are consistent in thickness (app. .0004")
XNGL4W	Indentations (roller bar marks)	Roller marks revealed horizontally for Q1 and Q3, vertically for Q2. Similar roller marks were found on K2 & K1, respectively.
	Microscopic (Ink and/or Toner)	Q1 & Q3 were prepared with toner. Q2 was prepared with color inkjet. Trash marks on K2 samples prepared with toner. Trash marks on K1 prepared with color inkjet.
	Visual & Microscopic (Trash Marks)	Trash marks on Q1, Q2, & Q3 were compared to the trash marks on K1 & K2. The K2 trash marks coincided with the trash marks on Q1 & Q3 (Q3 when turned upside down). The K1 trash marks coincided with the trash marks on Q2.
	E-Ruler for Measurements	Distance between trash marks were measured between K2, Q1, & Q3 and between K1 & Q2. The distance between the corresponding trash marks was the same.
XWTNMC	Microscopic Examination	Q1 and Q3 and K2 were produced with toner in all black mode. Q2 and K1 were produced in color mode.
	Oblique Light	Q1, Q3 and K2 had similar "roller" indentations from the photocopier process. Q2 and K1 did not.
	Overlays	Prepared overlays of K1 and K2. "Trash marks" of K2 correspond to Q1 and Q3 and K1 corresponds to Q2
XYXB33	ESDA	The same physical mark on the paper caused by rollers and the pick-up mechanism of the machine is revealed on Q1, Q3 and K2. No mark is revealed on Q2 and K1. The mentions already present on document Q1, Q2 and Q3 are revealed too.
	Macroscopic Examination	The same defects are observed on the one hand on Q1, Q3 and K2 and on the other hand on Q2 and K1.
	Microscopic Examination	Q1 and Q3 were produced by electrophotography as K2 while Q2 were produced by ink jet as K1.
	chemical examination (raman, FTIR, microanalysis-x)	Toners on Q1, Q3 and K2 have the same composition. Ink jet on Q2 and K1 are not either differentiated.
	FFT2D	Their wire marks (paper structure) are the same on Q1, Q2, Q3, K1 and K2.
Y2JCKV	Visual Examination	A visual examination was made to locate trash marks on the questioned and known documents.
	ESDA	An ESDA exam was performed on the questioned and known documents. Paper transport mechanism impressions were recovered in Q1, Q3 and the K2 samples that were overlayed and align. No meaningful impressions recovered in Q2 and K1 samples.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	Microscopic Examination was performed to determine the printing processes of the questioned and known documents. Q1, Q3 and K2 are black toner printed. Q2 and K1 samples are color inkjet printed.
	Overlays	A transparent overlay was made of the copier trash marks in the questioned documents located during the visual examination. These overlays were compared to the known samples. Q1, Q3 and K2 bear trash marks in common location and form. Q2 and K1 samples bear trash marks common location and form.
Y9G8JU	Visual Examination	Document Q1 consists of 1 sheet of white paper (approximately 8 1/2" x 11") with the cut-out wording of "Mr. Miller watch es girls CHANGE in The locker room". Document Q2 consists of 1 sheet of white paper (approximately 8 1/2" x 11") with the cut-out wording of "d O ug mill er slept WITH two Students". Document Q3 consists of 1 sheet of white paper (approximately 8 1/2" x 11") with the cut-out wording of "leave \$ 5,000 cash in oak Park trash OR i call Police". Also submitted Documents K1 which consists of 3 blank exemplars (approximately 8 1/2" x 11") produced by a copier in the yearbook classroom (Kodak ESP Office 2170) and Documents K2 which consists of 3 blank exemplars (approximately 8 1/2" x 11") produced by a copier in the school library (Canon Image Runner 3225).
	Oblique Light	Side oblique lighting was conducted on Documents Q1, Q2 and on Q3 all with negative results of indented writing.
	ESDA	This electrostatic detection apparatus was conducted on Documents Q1, Q2 and on Q3 showing no significant indentations being observed with a negative conclusion.
	Leica M60	A stereo microscope examination was conducted on Documents Q1, Q2 and on Q3 in which showing numerous copier trash marks. An examination was also conducted on K1 and on K2 showing numerous copier trash marks.
	VSC 6000/HS	Various examinations were performed on Documents Q1, Q2, Q3, K1 and on K2 by using different frequencies of light such as flood, spot, transparent, fluorescence, UV, IR and side lighting. Numerous copier trash marks are consistently present on the front of Documents Q1 and Q3, while there are also numerous copier trash marks present on the front of Document Q2.
YATQJQ	[No Methods Reported.]	
YB242R	ESDA	Feeder bands, picker bar indentation match Q1, Q3, K2.
	Overlays	Copier trash mark comparisons with match between Q1, Q3, and K2. Match between Q2 and K1.
	Oblique Light	Feeder indentation marks Q1, Q3, K2.
YG7YKR	Macroscopic Examination	The positioning/ formation, size and shapes of stray color inkjet marks on K1 are similar to the corresponding stray color inkjet marks on Q2, confirming the K1 machine was involved in the creation of Q2. The positioning/ formation, size and shapes of stray toner marks on K2 are similar to the corresponding stray color inkjet marks on Q1 and Q3, confirming the K2 machine was involved in the creation of Q1 and Q3.

TABLE 2

WebCode	Methods/Techniques	Observations
YHKXQH	Video Spectral Comparator (VSC)	Marks / dots appear to be on the same spots / pattern for both questioned notes and exemplary notes when they are superimposed with each other.
YWK6VR	Ultraviolet Light	Compared all sheets without differentiation using a light box.
	Naked Eye Exam	Patterns of trash marks observed & matched.
	Rulers	Measurements between trash marks were used in the comparison process.
YYW6AU	Visual Examination	There are spottings, marks on the samples and on the questioned documents (Q1, Q2, Q3), which are the traces of the copiers's document stage.
	Microscopic Examination	The Sample K1 and Q2 were produced by an inkjet photocopier, whereas the Sample K2 and Q1 and Q3 were made by an electrophotographic device.
	Video Spectral Comparator (VSC)	Using the function Red/Green Mix of VSC marks of the K1 sample can be seen on Q2, and marks of K2 are on Q1 and Q3.
ZEL33U	Macroscopic Examination	7.5x mag, 40x mag, 70x mag, 112x mag toner particles visualized, inkjet colorant visualized. Q1, Q3, K2 – toner, single colorant – Black (no color present). Q2, K1 – 4 or more color inkjet printing
	Video Spectral Comparator (VSC)	Exam for CPS codes on Q1, Q2, Q3, K1, and K2 – all negative (no CPS codes expected due to inkjet printing and toner (black) printing)
	Indented Writing	Q1, Q2, Q3 –no handwritten impressions of Investigative value; Q1, Q3 impressions of machine transport/ roller marks
	Oblique Light	paper creases/transport roller marks on Q1, Q3, K2 which are all consistent
	side by side visual exam	corresponding "trash marks" between Q's and K's located and evaluated
	Transmitted Light	corresponding "trash marks" between Q's and K's located and evaluated
ZK9ZMB	Visual Examination	Dots and smudges on the blank exemplars which were also found on the questioned documents.
ZL4HMQ	Microscopic Examination	Microscopic Examination identified the defects.
	Video Spectral Comparator (VSC)	examination paper Q and exemplar K were put together on transmitted light.
	Adobe Photo shop	examination paper Q and exemplar K were put together in the program.
ZL6BHD	Overlays	I compared each questioned document with the Known documents from each printer, overlapping to determine where trash marks overlapped. Q2 directly overlapped K1; Q1 and Q3 directly overlapped K2, with Q1 being only slightly off.
	Microscopic Examination	I compared the inks from both Qs and the Ks to determine if the print processes were the same. Q2's print process is the same as K1, while Q1 and Q3's print process is the same as K2.
ZPGTNF	Microscopic Examination	DEFECTS MARKS ON THE EXHIBITS DOCUMENTS.
	Video Spectral Comparator (VSC)	DEFECTS MARKS ON THE EXHIBITS MATERIAL(S)

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	ALIGNMENTS OF THOSE DEFECTS MARKS.
ZRPQR3	Visual Examination	Examined documents for indented impressions and any trash marks present on the documents.
	Oblique Light	Observed indentations present on all documents.
	Video Spectral Comparator (VSC)	Observed documents for indented impressions and photographed results for case file.
	Microscopic Examination	Observed documents to determine possible type of printing source (inkjet vs. toner).
ZTJE9C	Macroscopic/Microscopic Examination	Q1, Q3, K2 black monochrome electrostatic printing. Q2, K1 colour CMYK ink-jet. Q2 has linear horizontal ink voids.
	Overlays	Similarities in size, shape and location of trashmarks between Q2 and K1. Fine differences in these trashmarks were observed. Similarities in size, shape and location of trashmarks between Q1, Q3, and K2. These trashmarks are different than those observed on Q2 and K1.
	Video Spectral Comparator (VSC)	Fluorescent paper fibres were visible under IRL on all items. No significant findings.
	Oblique Light	Two horizontal linear indentations observed in similar locations on Q1, Q3 and K2. No indentations observed on Q2 or K1.
	ESDA	No additional findings.
ZV9P2Q	Visual Examination	Examinations of the Q and K items visually; observations of the paper, printing process and trash mark patters were: the paper appeared similar visually, the printing processes need to be examined microscopically and different trash mark patterns were observed within the items.
	Microscopic Examination	Printing processes identified: Q1 = Toner, Q2 = Ink Jet (CMYK), Q3 = Toner, K1 = Ink Jet (CMYK), K2 = Toner. Trash mark patterns observed microscopically, two different patters within these two groups of documents. Slight indentations observed; see Oblique Light examinations.
	Ultraviolet Light	The paper used to produce the Q and K items is indistinguishable at this level of analysis, similar in all respects and dissimilar in none: 1) Overall color. 2) Mottled appearance. 3) UV response medium. 4) Surface characteristics.
	ESDA	No indentations of writing were recovered in any of the documents. Indentations of roller marks were observed.
	Oblique Light	Oblique light with microscopic examinations revealed slight indentations possible from the machine mechanisms used to produce the documents.
	Video Spectral Comparator (VSC)	VSC examinations confirmed the UV examinations above, with all of the pages of paper (Q and K) behaving similarly throughout the electromagnetic spectrum.
	Overlays	Digital overlay and acetate overlay methods were used to compare the trash mark patterns found on the questioned and known items. The trash mark pattern on Q1 matches the trash mark pattern on K2. The trash mark pattern on Q2 matches the trash mark pattern on K1. The trash mark pattern on Q3 matches the trash mark pattern on K2.
ZYLLQZ	Visual Examination	trash marks visible, measurements acquired. K1 is an inkjet copier, K2 is monochromatic photocopier

TABLE 2

WebCode	Methods/Techniques	Observations
	Thickness	Bel-Art paper calipers to measure the weight of the paper
	Video Spectral Comparator (VSC)	UV- paper brighteners. Spot - fluorescent paper fibers in paper. IRR- nothing noted
	ESDA	No indentations found with and without humidity
	Overlays	Trash marks located - Q1 and Q3 consistent with K2. Q2 is consistent with K1.
	Identifont	Not enough letter in each set for identification.
ZZFA7B	Overlays	Using a transparency film I traced over the K1 and K2 trash marks. I then placed these transparencies over the Q1, Q2, and Q3 notes, to compare the trash marks and determine if there is a common source.

Response Summary

Participants: 214

Methods Utilized

ESDA	67	Magnification	8	Thickness	4
Handwriting Examination	0	Micrometer	2	Transmitted Light	33
Indented Writing	13	Microscopic Exam	120	UV Light	20
Infrared Light	2	Oblique Light	49	Visual Exam	83
Macroscopic Exam	19	Overlays	74	VSC	122
Macroscopic/Microscopic Exam	32	Ruler	6		

Conclusions

TABLE 3

WebCode	Conclusions
22AUHV	After examination and comparison of the notes and blank exemplar copies I have reached the following conclusions: The note "marked Q1" was produced using the same photocopier which was used to produce the three blank exemplars "marked K2". The note "marked Q2" was produced using the same photocopier which was used to produce the three blank exemplars "marked K1". The note "marked Q3" was produced using the same photocopier which was used to produce the three blank exemplars "marked K2".
26ADTM	1) The photocopier, whose blank exemplars K1 was given to compare, was used in the production of the questioned note Q2. 2) The photocopier, whose blank exemplars K2 was given to compare, was used in the production of the questioned notes Q1 and Q3.
27L6QB	Examination and comparison of questioned items #Q1, #Q2 and #Q3 with known items #K1 and #K2 resulted in the following opinions: The item #K1 copier was used in the production of item #Q2. The item #K2 copier was used in the production of item #Q1. The item #K1 copier was probably NOT used in the production of items #Q1 or #Q3. While the item #K1 copier was not used in the final production of items #Q1 and #Q3, #K1 cannot be excluded from having been used to produce some of the cut out text pieces appearing on items #Q1 and #Q3. The item #K2 copier was probably NOT used in the production of item #Q2. While the item #K2 copier was not used in the final production of item #Q2, #K2 cannot be excluded from having been used to produce some of the cut out text pieces appearing on item #Q2. Item #Q2 appears to contain a section of toner with a possible counterfeit protection system (CPS) code. If additional exemplars from the item #K2 copier taken in color mode can be obtained, further examination would be warranted. The item #K2 copier was probably NOT used in the production of item #Q3. While there is no evidence to suggest that the item #K2 copier was used in the final production of item #Q3, #K2 cannot be excluded from having been used to produce some of the cut out text pieces appearing on item #Q3. Items #Q1, #Q2 and #Q3 were processed for indented writing. No indented writing was developed.
2BY6M3	It was determined that the questioned documents, items Q1 and Q3, were generated by the same printer that generated the specimen documents, items K2. It was further determined that the questioned document, item Q2, was generated by the same printer that generated the specimen documents, items K1.
2EVRGQ	Due to the size, shape and orientation of the 'trash' marks present on Q1 matching those present on K2, in our opinion, Q1 was produced using K2. Due to the size, shape and orientation of the 'trash' marks present on Q3 matching those present on K2, in our opinion, Q3 was produced using K2. Due to the size, shape and orientation of the 'trash' marks present on Q2 matching those present on K1, in our opinion, Q2 was produced using K1.
2FQRMW	3.1 The evidence supports the proposition that the questioned threatening notes copies marked "Q1" and "Q3" were produced by "Canon Image Runner 3225" copier. 3.2 The evidence supports the proposition that the questioned threatening note marked "Q2" was produced by "Kodak ESP Office 2170" copier.
2J8P3R	Based on the above findings, in my professional opinion, the known photocopier K1 was used in the production of the questioned note Q2 and the known photocopier K2 was used in the production of the questioned notes Q1 and Q3.
2K43PK	1-The (k2) photocopier was used in the production of the (Q1 and Q3) note. 2- The (k1) photocopier was used in the production of the (Q2) note.
2LF8EP	The defects, patterns and marks found on the note marked as "Q1" are the same as the ones found on the blank exemplars marked as "K2". The defects, patterns and marks found on the note marked as "Q2" are the same as the ones found on the blank exemplars marked as "K1". The defects, patterns and marks found on the note marked as "Q3" are the same as the ones found on the blank exemplars marked as "K2". In light of the abovementioned observations I reached the conclusion that the questioned notes marked as "Q1" and "Q3" were produced from the copier in the school library

TABLE 3

WebCode	Conclusions
	(Canon Image Runner 3225) and the questioned note marked as "Q2" was produced from the copier in the yearbook classroom (Kodak ESP Office 2170).
2YZEXN	Exhibits Q1 and Q3 were produced using the K2 copier (Canon Image Runner 3225). Exhibit Q2 was produced using the K1 copier (Kodak ESP Office 2170).
34E68P	1. The copier in the school library (K2) was used in the production of the questioned items (Q1, Q3). 2. The copier in the yearbook classroom (K1) was used in the production of the questioned item (Q2).
3AJHUA	After an examination I made the following observation and comparison: "Q1": Note left on December 4, 2017, reading "Mr Miller watches girl change in the locker room"; "Q1" has the same dots patterns as represented by blank exemplar "K2"; "Q2": Note left on December 12, 2017, reading "Doug Miller slept with two students"; "Q2" has the same dots patterns as represented by blank exemplar "K1"; "Q3": Note left on December 15, 2017, reading "Leave \$5000 CASH IN Oak Park trash or I call police"; "Q2" has the same dots patterns as represented by blank exemplar "K2". Based on the aforementioned observation I came to the following conclusions: "Q1" and "K2" are produce from the same photocopier Kodak ESP Office 2170; "Q2" and "K1" are produced from the same photocopier Cannon Image Runner 3225; "Q3" and "K2" are produced from the same photocopier Kodak ESP Office 2170.
3DJCMP	(i) The questioned notes "Q1" and "Q3" showed similar and consistent trash marks appeared at the same position as the known exemplars of "K2". Hence, I am of the opinion that the known photocopier that produced the exemplars of "K2" was used in the production of these questioned notes "Q1" and "Q3". (ii) The questioned note "Q2" showed similar and consistent trash marks appeared at the same position as the known exemplars of "K1". Hence, I am of the opinion that the known photocopier that produced the exemplars of "K1" was used in the production of this questioned note "Q2". (iii) The questioned notes "Q1" and "Q3" showed dissimilar and inconsistent trash marks appeared at the different position from the known exemplars of "K1". Hence, I am of the opinion that the known photocopier that produced the exemplars of "K1" was not used in the production of these questioned notes "Q1" and "Q3". (iv) The questioned note "Q2" showed dissimilar and inconsistent trash marks appeared at the different position from the known exemplars of "K2". Hence, I am of the opinion that the known photocopier that produced the exemplars of "K2" was not used in the production of this questioned note "Q2".
3K2UVQ	1) The known photocopier K1 was used in the production of the questioned note Q2. 2) The known photocopier K2 was used in the production of the questioned note Q1 and Q3.
3KX8JJ	Based upon the documents submitted, it is my professional opinion that the identification the trash marks on: 1) Q1 matched the trashmarks on K2 (Kodak ESP Office 2170 copier). 2) Q2 matched the trashmarks on K1 (Canon Image Runner 3225 copier). 3) Q3 matched the trashmarks on K2 (Kodak ESP Office 2170 copier).
3YXENV	The patterns, marks and defects found on the document marked as "Q1" are the same patterns, marks and defects on the document marked as "K2" The patterns, marks and defects found on the document marked as "Q2" are the same patterns, marks and defects on the document marked as "K1" The patterns, marks and defects found on the document marked as "Q3" are the same patterns, marks and defects on the document marked as "K2" In light of the abovementioned observations I reached the conclusion that the questioned documents marked as "Q1" and "Q3" are the source of the document marked as "K2" and the questioned document marked as "Q2" is the source of the document marked as "K1" and .
43UVMM	1. In view of the significant similarities in printing characteristics, the copier "Kodak ESP Office 2170" (K1) in the yearbook classroom was used in the production of the questioned note marked Q2. It was not used to produce the questioned notes marked Q1 and Q3. 2 In view of the significant similarities in printing characteristics, the copier "Cannon Image Runner 3225" (K2) in the school library was used in the production of the questioned notes marked Q1 and Q3. It was not used to produce the questioned note marked Q2.
48PMVK	Results of the investigation shows that questioned documents Q1 and Q3 are printed with the same

TABLE 3

WebCode	Conclusions
	laser printer (toner) K2. The questioned document Q2 is printed with the different printer that Q1 and Q3. Item Q2 is printed with colour ink jet printer K1.
4HAN3Z	After an examination and comparison I reached the following conclusions: 1. The documents in question marked "Q1" and "Q3" were produced by the known photocopier which produced the specimen material marked "K2.1" to "K2.3" (Canon Image Runner 3225). 2. The document in question marked "Q2" was produced by the known photocopier which produced the specimen material marked as "K1.1" to "K1.3" (Kodak ESP Office 2170).
4PQYF2	The known photocopier "K1" was used in the production of the questioned note "Q2". The known photocopier "K2" was used in the production of the questioned notes "Q1" and "Q3".
4QL34N	Items Q1 and Q3 were produced using the same photocopier as Item K2. Item Q2 was produced using the same photocopier as Item K1.
4TR6U8	Based on the aforementioned observations, I came to the following conclusions: 1 The trash marks on the documents marked as "Q1" and "Q3" were generated by the same printer of the exemplars marked by me as "1/K2", "2/K2" and "3/K2". 2 The trash marks on the documents marked as "Q2" were generated by the same printer of the exemplars marked by me as "1/K1", "2/K1" and "3/K1".
4XYQKP	FIRST. The Questioned document Q1, a white sheet of paper "bond" that contains a note with the date of December 4th, 2017 and reads "Mr. Miller watches girls change in the locker room" (LDC-0266/2018-1); It is determined that the document comes from the same print source of the printed base sheets for comparison identified K2, that were produced by the copier in the school's library. (Canon Image Runner 3225). SECOND. The Questioned document Q2, a white sheet of paper "bond" that contains a note with the date of December 12th, 2017 and reads "Doug Miller slept with two students" (LDC-0266/2018-2); It is determined that the document comes from the same source of base sheets for comparison identified as K1, that were produced by the copier in the yearbook classroom (Kodak ESP Office 2170). THIRTH. The Questioned document Q3, a white sheet of paper "bond" that contains a note with the date of December 15th, 2017 and reads "Leave \$5000 cash in Oak Park trash I call the police" (LDC-0266/2018-3); It is determined that the document comes from the same print source of the printed base sheets of comparison identified as K2, that were produced by the copier in the school's library (Canon Image Runner 3225)
646L4P	The Q1 notes of December 4, 2017 and Q3 of December 15, 2017, were printed with the photocopier of the school library. The Q2 note of December 12, 2017, was printed with the photocopier of the yearbook room.
64NTLL	In my opinion: the copier K1 was used in the production of the questioned note Q2. the copier K2 was used in the production of the questioned notes Q1 and Q3.
6A9TG8	The exhibit marked "Q1" produced by the known photocopier (Canon Image Runner 3225) situated in the school library. The exhibit marked "Q2" was produced by the known photocopier (Kodak ESP Office 2170) situated in the yearbook classroom. The exhibit marked "Q3" the origin is unknown and cannot be linked to the known photocopiers
6G8DLN	Item 2 (Q2) was produced by the machine used to produce Item 4 (K1). Items 1 (Q1) and 3 (Q3) were produced by the machine used to produce Item 5 (K2). No indented writing or watermarks were observed on Items 1 through 3 (Q1 through Q3) utilizing sidelighting and the Electrostatic Detection Apparatus. Item 1 (Q1) and 3 (Q3) were produced by a toner process. Item 2 (Q2) was produced by an ink jet process.
6HQK3K	1. It has been concluded that the questioned note Q2 was produced by the known copier that produced the K1 exemplars. 2. It has been concluded that the questioned notes Q1 and Q3 were not produced by the known copier that produced the K1 exemplars. 3. It has been concluded that the questioned notes Q1 and Q3 were produced by the known copier that produced the K2 exemplars. 4. It has been concluded that the questioned note Q2 was not produced by the known copier that produced the K2 exemplars.

TABLE 3

WebCode	Conclusions
78JJAR	The anonymous notes identified as Q1 and Q3 sheets come from the Canon Image Runner 3225 photocopier since the marks left by the copier are the same. The anonymous note identified as Sheet Q2 comes from the Kodak SP Office 2170 photocopier, since the marks left by the copier are the same
79B8EL	Physical examinations were conducted on the Exhibit Q1 through Q3 notes. Exhibit Q1 and Q3 were produced using an office machine system utilizing black toner (systems of this type include photocopiers and laser printers). Exhibit Q2 was produced using an office machine system using inkjet technology. Exhibits Q1 through Q3 were compared to the known exemplars (Exhibits K1 and K2). Exhibits Q1 and Q3 were produced on the Exhibit K2 copier. Exhibit Q2 was produced on the Exhibit K1 copier. The results are based on the method of production and the significant combination (constellation) of "trash marks". Trash marks are vestiges produced on a document as a result of imperfections/defects in a photocopier's or scanner's copy glass, lid, lens, photo-sensitive drum/belt or from a combination of any of these sources.
7BJPQH	The documents marked "K1" and "Q2" were produce by the same photocopier. The documents marked "K2"; "Q1 and Q3" were produce by the same photocopier.
7P3BBC	It was determined that the Item 5 (K2) copier was used to prepare Item 1 (Q1) and Item 3 (Q3). It was determined that the Item 4 (K1) copier was used to prepare Item 2 (Q2). No indented writing was observed on any of the submitted items. Additional assessments and observations have been made and recorded for possible future examinations.
7V97UC	The Item 5 (K2) printer/components were used in the production of Items 1 (Q1) and 3 (Q3). The Item 4 (K1) printer/components were used in the production of Item 2 (Q2). No indented writing or watermarks were observed utilizing the Electrostatic Detection Apparatus and side lighting. Additional assessments and observations have been made regarding the submitted items and are recorded for possible future comparison.
7VLBDM	Q1 and K2 share a common source; at one point in time Q1 or a generation of Q1 was produced on the same photocopier as K2. Q2 and K1 share a common source; at one point in time Q2 or a generation of Q2 was produced on the same photocopier as K1. Q3 and K2 share a common source; at one point in time Q3 or a generation of Q3 was produced on the same photocopier as K2.
87KGQL	The photocopier K2 was used in the production of the note Q1. The photocopier K1 was used in the production of the note Q2. The photocopiers K1 and K2 was not used in the production of the notes Q3.
8CBBT9	The known photocopier marked "K1" WAS USED in the production of the questioned note marked "Q2". The Known photocopier marked "K2" WAS USED in the production of the questioned notes marked "Q1" and "Q3".
8LUAC4	After an examination and comparison between the questioned and exemplar documents, I made the following observations and conclusions: 1 Corresponding trash marks were identified between the exemplars of the known photocopier marked "K2" and the questioned documents marked "Q1" and "Q3", indicating that the said photocopier marked K2 was used in the production of the questioned documents marked "Q1" and "Q3". 2 Corresponding trash marks were identified between the exemplars of the known photocopier marked "K1" and the questioned document marked "Q2", indicating that the said photocopier marked "K1" was used in the production of the questioned documents marked "Q2".
8MQHQE	Our examination of the Samples (K1 and K2) and the Questioned Documents (Q1, Q2 and Q3) show a perfect coverage of the found residue/contamination in the following cases: K1 with Q2, K2 with Q1 and Q3. Final conclusion: Based on our examination and considering the fact that we have over ten cases of the mentioned residue/contamination on each page we conclude that the documents Q1 and Q3 were printed in the library (Canon Image Runner 3225) and the document Q2 was printed in the classroom (Kodak ESP Office 2170).
8UBLVW	It is determined that the Canon Image Runner (3225) produced the Document Q-1 and Q-3. It is determined the the Kodak ESP Office (2170) produced Document Q-2.

TABLE 3

WebCode	Conclusions
8WWP4U	<p>During the microscopic examination it was detected that the anonymous notes Q1 and Q3 were produced by a Laser Copier and that the anonymous note Q2 was produced by an Inkjet copier. The blank samples were produced by the copier in the yearbook classroom (K1) which is an All-in-One Inkjet Printer and by the copier in the school library (K2) which is a B/W Laser Printer. A great number of artifacts could be found on all questioned anonymous notes and on all blank samples which were handed over for examination. The artifacts result of copied specks of dirt or other contaminants on the scanner glass of each copier. So the position and shape of these artifacts are individual for each specific machine. The questioned notes Q1 and Q3 show congruent positions of copied artifacts like the blank samples of the copier in the school library (K2). Also the questioned note Q2 shows congruent positions of copied artifacts like the blank samples of the copier in the yearbook classroom (K1). As a result of the applied examination methods the copier in the school library (K2 - Canon Image Runner 3225) could be identified as the copier which was used to copy the questioned notes Q1 and Q3 and the copier in the yearbook classroom (K1 - Kodak ESP Office 2170) could be identified as the copier which was used to copy the questioned note Q2.</p>
8YN29N	<p>Analysis documentologica, through direct observation and by optical instruments suitable as spectral comparator video and stereoscopic microscope, taking into account the characteristics and particularities, as available, sizes, distances, areas, which leaves the questioned sheets toner to then compare them against the indubitadas, found documents set out with Q1 and Q3 are identified with k2 photocopier and Q2 questioned documents are identified with the photocopying K1.</p>
8ZWL6G	<p>The shape and position of the defect marks on Q1 match those on the samples from K2. In my opinion this could not have happened by chance and, therefore, there is conclusive evidence that K2 was used to produce the Q1 note either directly or at some point in its production. Similarly the shape and position of the defect marks on Q3 match those on the samples from K2 and therefore there is conclusive evidence that K2 was used in the production of Q3, either directly or at some point in its production. Q2 was produced by inkjet printing and, therefore, could not have been directly produced from either K1 or K2. However, the defect marks on Q2 match those on the samples from K1 and, therefore, K1 must have been used in its production at some point.</p>
9694LP	<p>1) The peculiarities of production left in the sample sheet K1 printed in the photocopier of the yearbook room (Kodak ESP Office 2170), is fully related with which they are exhibited in the questioned note Q2 when reversing the direction of the text. 2) The peculiarities of production left in the sample sheet K2 printed in the photocopier of the school library (Canon Image Runner 3225), is fully related to the ones shown in the questioned notes Q1 and Q3, the note Q3 must reverse the direction of the texts to identify details.</p>
97YGFN	<p>The Q1 and Q3 doubt documents were prepared by the K2 printer (known photocopier was used in the production of the anonymous note). The Q2 doubt documents come from the K1 printer source or (known photocopier was used in the production of the anonymous note)</p>
9A26M4	<p>The three notes in items Q1-Q3 have been examined and respectively compared with the two sets of blank exemplars K1a-c and K2a-c. The printed contents in Q1 and Q3, and the trash marks on K2a-c were made up of black toner particles, while the printed contents in Q2 and the trash marks on K1a-c were made up of coloured ink droplets. Common pattern of trash marks were found in items Q1, Q3 and the known exemplars in items K2a-c; the respective trash marks were found to be agreed in size, shape and relative positions. The relative positions of trash marks on Q3 were in a 180 degree opposite orientation from Q1 and K2a-c. Also, common roller marks were found between items Q1, Q3 and the known exemplars in items K2a-c. The above findings indicate that the K2 (library) photocopier was used in the production of the questioned notes in Q1 and Q3. On the other hand, common pattern of trash marks were found in item Q2 and the known exemplars in items K1a-c; the respective trash marks were found to be agreed in size, shape and relative positions. The above findings indicate that the K1 (Classroom) photocopier was used in the production of the questioned note in Q2.</p>
9DZW2P	<p>The known photocopier marked "K1" was used in the production of the questioned note marked "Q2". The known photocopier marked "K2" was used in the production of the questioned notes marked "Q1" and "Q3".</p>

TABLE 3

WebCode	Conclusions
9HV9TL	Based on the visual and instrumental examinations of the questioned machine printed entries on Exhibits Q1 through Q3, the following was determined: Exhibits Q1 and Q3 were produced using toner (e.g., photocopier, laser printer). Exhibit Q2 was produced using inkjet (e.g., inkjet printer, all-in-one machine). Based on the visual examination and comparison of Exhibits Q1 through Q3 with the known exemplars Exhibits K1-1 through K1-3 and K2-1 through K2-3, the following was determined: Exhibits Q1 and Q3 were produced by the printer used in the production of known exemplars K2-1 through K2-3. Exhibit Q2 was produced by the printer used in the production of known exemplars K1-1 through K1-3.
9ML3V9	THE KNOWN PHOTOCOPIER MARKED "K1" WAS USED IN THE PRODUCTION OF THE QUESTIONED NOTE MARKED "Q2". THE KNOWN PHOTOCOPIER MARKED "K2" WAS USED IN THE PRODUCTION OF THE QUESTIONED NOTES MARKED "Q1" AND "Q3".
9Y3P69	The examination resulted in the findings that the known photocopier was used in the production of questioned note.
A3W2K7	It depends on what you mean by production. if you mean the final copy of the notes affixed to the teacher's door had at least one run through the school copiers, then yes, both copiers were used in the "production" of these document. Were they used in the actual creation of the original version of the notes? It is not possible to ascertain that fact (explained below) which is why I would limit my opinion to it is probable that K1, the Kodak photocopier found in the yearbook classroom was used in the creation of anonymous note Q2. It is probable that the library copier was used in the creation of anonymous notes Q1 and Q3. (There is a difference in creating and actual original and manufacturing a reproduction from that original.)
A6NM7M	The K1 copier was used in the production of Q2. The K2 copier was used in the production of Q1 and Q3. No decipherable indented impressions were recovered from Q1 through Q3. Three ESDA lift sheets were created from Q1 through Q3 and were made sub-items Q1.1, Q2.1 and Q3.1. The transparent plastic-like lifts used to recover the indentations are being returned in evidence container # A. The lifts should be retained as evidence. Investigative: It may be possible to associate the cut out lettering on Q1 through Q3 with their original source(s), should evidence of that nature be located.
A93W47	It was determined Item 4 (K1) was used in the production of Item 2 (Q2), and that Item 5 (K2) was used in the production of Items 1 (Q1) and 3 (Q3). No indented writing was observed on Items 1 through 3 (Q1 through Q3) using side-lighting and the Electrostatic Detection Apparatus (ESDA).
AATZT7	The questioned notes Q1 and Q3 were produced from the same copier as the blank exemplars K2, the copier in the school library (Cannon image Runner). The questioned note Q2 was produced from the same copier as the blank exemplars K1, the copier in the yearbook classroom (Kodak ESP Office 2170).
APVJZ	1. The machine used to produce Exhibit (K2) was used in the production of (Q1) and (Q3). 2. The machine used to produce Exhibit (K1) was used in the production of (Q2). 3. Exhibits (Q1-Q3) were processed for the presence of indented writing impressions. No impressions were found.
AT8ZWL	Based on the observations presented in "Methods and Techniques" it is concluded that the samples Q1 and Q3 have been made with the same device as the blank exemplars K2. It was assessed that the probability of the observed similarities occurring by coincidence (in case the samples Q1 and Q3 were printed using any other device than the device exemplar copies K2 were made with) is very low. Based on the observations presented in "Methods and Techniques" it is concluded that the sample Q2 has been made with the same device as the blank exemplars K1. It was assessed that the probability of the observed similarities occurring by coincidence (in case the sample Q2 was printed using any other device than the device exemplar copies K1 were made with) is very low.
AW7CTL	The K1 photocopier was used in the production of Q2. The K2 photocopier was used in the production of Q1 and Q3.
AXKJE3	The findings very strongly suggest the hypothesis that the questioned notes Q1 & Q3 were produced on the same copier used to make the K2 exemplars or issued from a copy made from the K2 document.

TABLE 3

WebCode	Conclusions
	The findings very strongly suggest the hypothesis that the questioned note Q2 was produced on the same copier used to make the K1 exemplars.
B2WKHT	After examination and comparison I reached the following conclusion: 7.1 The photocopier that produce the blank exemplars marked "K1" also produce the document marked "Q2". 7.2 The photocopier that produce the blank exemplars marked "K2" also produce the documents marked "Q1" and "Q3".
BB8L39	After an examination and comparison of the respective documents I reached the conclusion that the documents in question marked as "Q1" and "Q3" were produced utilising the known photocopier which produced the specimen material marked as "K2.1" to "K2.3" (Canon Image Runner 3225) and that the document in question marked as "Q2" was produced utilising the known photocopier which produced the specimen material marked as "K1.1" to "K1.3" (Kodak ESP Office 2170) due to the visual observation and identification of corresponding defects which occurs on the documents.
BHKXWK	Once applied the method we find that the elements of identity of the photocopier, shapes and locations of the spaces, are in the questioned documents and also in the known documents
BLHGWX	Based on the abovementioned observations, I came to the following conclusions: 1 The documents marked "Q1" and "Q3" were produced using Canon Image Runner 3225 copier (which produced the document marked "K2"). 2 The document marked "Q2" was produced using Kodak ESP Office 2170 copier (which produced the document marked "K1").
BMWDDG	1. The copier in the school library (Canon Image Runner 3225), was used in the production of the questioned noted identified as Q1, dated December 4, 2017. 2. The copier in the yearbook classroom (Kodak ESP Office 2170), was used in the production of the questioned noted identified as Q2, dated December 12, 2017. 3. The copier in the school library (Canon Image Runner 3225), was used in the production of the questioned noted identified as Q3, dated December 15, 2017.
BVAUYH	In accordance with the foregoing and as a conclusion it is established that: The Q1 and Q3 doubt documents come from the K2 printer source or (the known photocopier was used in the production of the anonymous note). The Q2 doubt documents come from the K1 print source or (the known photocopier was used in the production of the anonymous note).
BXZJCP	Based on the examinations of Item #1 (Q1-Q3) documents submitted to the known standards located in Item #2 (K1A-K1C) and Item #3 (K2A-K2C) it is my opinion: 1. That at least on generation of the Item #1 Q1 and Q3 documents were prepared on the same copier as that of the submitted known standards produced from the copier in the school library (Canon Image Runner 3225) Item #3 marked K2A-K2C. 2. That at least on generation of the Item #1 Q2 document was prepared on the same copier as that of the submitted known standards produced by the copier in the yearbook classroom (Kodak ESP 2170) Item #2 marked K1A-K1C.
BYU8RY	[No Conclusions Reported.]
C4KB84	The Item 1 (Q1) and Item 3 (Q3) documents were prepared utilizing toner technology and were determined to be immediately prepared by the Item 5 (K2) toner copier. The Item 2 (Q2) document was prepared utilizing inkjet technology and was determined to be immediately prepared by the Item 4 (K1) inkjet copier. No indented writing was observed on the submitted items utilizing side-lighting and the Electrostatic Detection Apparatus. Additional observations and assessments have been made regarding the submitted items and recorded for possible future examinations.
C7Q3QX	Based on examination of the three (3) questioned notes (Item #1, Q1-Q3), and examination and comparison with known exemplars – known exemplars attributed to the yearbook classroom copier (Kodak; Item #1, K1a-K1c) and known exemplars attributed to the school library copier (Canon; Item #1, K2a-K2c), the following conclusions were made in determining the source of the questioned notes: The school library copier (K2; Canon Image Runner 3225) is the source of the questioned note beginning with "Mr. Miller" (Q1), left on December 4, 2017. The yearbook classroom copier (K1, Kodak ESP Office 2170) is the source of the questioned note beginning with "d 0 ug mill er" (Q2), left on December 12, 2017. The school library copier (K2; Canon Image Runner 3225) is the source of the

TABLE 3

WebCode	Conclusions
	questioned note beginning with "leave \$ 5,000" (Q3), left on December 15, 2017.
C9VRWD	1. It has been concluded that the questioned note, Q2, was produced by the known photocopier that produced the K1 exemplars. 2. It has been concluded that the questioned note Q1 and Q3 were not produced by the known photocopier that produced the K1 exemplars. 3. It has been concluded that the questioned notes Q1 and Q3 were produced by the known photocopier that produced the K2 exemplars. 4. It has been concluded that the questioned note Q2 was not produced by the known photocopier that produced the K2 exemplars.
CCWXAX	[No Conclusions Reported.]
CXT9ZX	1.) The documents marked "Q1" and "Q3" were produced by the copier that produced the specimen documents marked "K2" (purported to be a "Canon Image Runner 3225"). 2.) The document marked "Q2" was produced by the copier that produced the specimen documents marked "K1" (purported to be a "Kodak ESP Office 2170").
D4ZHZZ	It was determined through a trash mark comparison, the photocopier from the yearbook classroom, K1, is the source of the note, Q2. It was also determined that the photocopier from the library, K2, is the source of the notes, Q1 and Q3.
D773P6	Physical, microscopic, instrumental and comparative examinations revealed the following: Exhibits Q1/Q3 and Exhibit K2 originate with the same source. They share a pattern of extraneous toner printed marks, as well as other machine-produced features revealed by instrumental examination. Exhibit Q2 and K1 originate with the same source. They share a pattern of extraneous inkjet printed marks, as well as the absence of the types of machine-produced features referenced in the prior paragraph.
DA4Z3X	Based on the aforementioned observations, I came to the following conclusions: 1 The documents marked as "Q1" and "Q3" were produced by the same printer of the exemplars marked as "K2". 2 The document marked as "Q2" was produced by the same printer of the exemplars marked as "K1".
DBEB7A	[No Conclusions Reported.]
DBWRF4	It was determined that the machine used to produce the Item 5 (K2) exemplars was used in the production of the Item 1 (Q1) and Item 3 (Q3) questioned documents. It was determined that the machine used to produce the Item 4 (K1) exemplars was used in the production of the Item 2 (Q2) questioned document. No indented writing was observed on Items 1 through 3 (Q1 through Q3) utilizing side lighting and electrostatic detection.
DEG8YP	1. The photocopier from classroom (K1) was used to produce note left on December 12, 2017 (Q2). 2. The photocopier from library (K2) was used to produce note left on December 4, 2017 (Q1) and note left on December 15, 2017 (Q3).
DEUBDW	Based on the aforementioned observations, I came to the following conclusions: 1 The thrash marks on the documents marked "Q1" and "Q3" were generated by the same printer that created the thrash marks on the documents marked "K2". 2 The thrash marks on the document marked "Q2" were generated by the same printer that created the thrash marks on the documents marked "K1".
DFBVEY	The results of the examination strongly support that the notes Q1 and Q3 were produced using printer K2 (Level +3). The results of the examination strongly support that the note Q2 was produced using printer K1 (Level +3). The results of the examination extremely strongly support that the notes Q1 and Q3 were not produced using printer K1 (Level -4). The results of the examination extremely strongly support that the note Q2 was not produced using printer K2 (Level -4).
DGMPY7	Examinations using magnification and specialized lighting revealed the following: The machine that produced the K2 exemplars produced the Q1 and Q3 documents. This finding is based on a common pattern of toner trash marks. The machine that produced the K1 exemplars produced the Q2 document. This finding is based on a common pattern of color inkjet trash marks.

TABLE 3

WebCode	Conclusions
DPYNQW	Items Q1 and Q3 were produced on the known photocopier in Item K2. Item Q2 was produced on the known photocopier in Item K1.
DUV9VF	Characteristics in common were noted between Items Q1, Q3, and K2 which indicate that they originated from a common source. Characteristics in common were noted between Items Q2 and K1 which indicate that they originated from a common source.
DXVLFK	Upon completion of an examination and comparison of the exhibits and knowns submitted in this case, this examiner has reached the following opinions: The Q-1 exhibit was produced by the K-2 copier. The Q-2 exhibit was produced by the K-1 copier. The Q-3 exhibit was produced by the K-2 copier.
E2MM3D	In light of the above mentioned observations I reached the conclusion that the questioned notes marked "Q1" and "Q3" were produced from the copier in the school library (Canon Runner 3225) and the questioned marked "Q2" was produced from the copier in the yearbook classroom (Kodak ESP Office 2170).
EKET7X	3.1 The known photocopier "K1" and "K2" was probably not used in the production of the questioned note "Q1". 3.2 The known photocopier "K1" was used in the production of the questioned note "Q2". 3.3 The known photocopier "K2" was used in the production of the questioned note "Q3".
EKZ7WW	Based on the aforementioned observations, I came to the following conclusions: 1 The documents marked "Q1", "Q3" and "K2" were generated by the same photocopier (Canon Image Runner 3225). 2 The documents marked "Q2" and "K1" were generated by the same photocopier (Kodak ESP Office 2170).
EM8JH4	It was determined that Items 1 (Q1) and 3 (Q3) were prepared by the photocopier used to produce Item 5 (K2). The photocopier used to produce Item 4 (K1) can be eliminated as having produced Items 1 (Q1) and 3 (Q3) based on class characteristics. It was determined that Item 2 (Q2) was prepared by the photocopier used to produce Item 4 (K1). The photocopier used to produce Item 5 (K2) can be eliminated as having produced Item 2 (Q2) based on class characteristics.
EMP3AA	In my opinion, there is qualified support for the photocopier that printed items K1 also printed the questioned document labeled Q2. In my opinion, there is no support for the photocopier that printed items K1 printed the questioned documents labeled Q1 and Q3. In my opinion, there is qualified support for the photocopier that printed items K2 also printed the questioned labeled documents Q1 and Q3. In my opinion, there is no support for the photocopier that printed items K2 printed the questioned document labeled Q2.
EWGC3D	Purpose: To determine if any of the photocopiers, as represented by the known exemplars, could be used in the production of the questioned notes (Q1, Q2, Q3). Consideration of the print technologies and additional discriminating factors were undertaken in order to assess the following pair of competing hypotheses: 1) The copier that was used to create the K1 document was also used to create the questioned note 2) The copier that was used to create the K2 document was also used to create the questioned note These hypotheses were evaluated when comparing Q1 to K1 and K2, Q2 to K1 and K2 and Q3 to K1 and K2. Q1 to K1 and K2 The evidence provides extremely strong support for proposition 2) (that the copier used to create the document K2 was also used to create the questioned note Q1) rather than the alternative hypothesis 1). Q2 to K1 and K2 The evidence provides extremely strong support for proposition 1) (that the copier used to create the document K1 was also used to create the questioned note Q2) rather than the alternative hypothesis 2). Q3 to K1 and K2 The evidence provides extremely strong support for proposition 2) (that the copier used to create the document K1 was also used to create the questioned note Q3) rather than the alternative hypothesis 1).
EX3XEU	Q1: The printing method is the same as "K2", when superimposed onto the each other the trash marks correspond therefore "Q1" was produced with the same photocopier as "K2". Q2: The printing method is the same as "K1", when superimposed onto the each other the trash marks correspond therefore "Q2" was produced with the same photocopier as "K1". Q3: The printing method is the same as "K2", when superimposed onto the each other the trash marks correspond therefore "Q3" was produced with the same photocopier as "K2".

TABLE 3

WebCode	Conclusions
EXP4ZF	It was determined that the Item 4 (K1) machine was used in the production of the Item 2 (Q2) ink jet generated document. It was determined that the Item 5 (K2) machine was used in the production of the Item 1 (Q1) and Item 3 (Q3) toner generated documents. No indented writing was observed on Items 1 through 3 (Q1-Q3) utilizing side lighting and the Electrostatic Detection Apparatus. Additional assessments and observations have been made and recorded for future comparison purposes.
EZAK6Y	3.1 Corresponding marks were identified between the questioned documents "Q1" and "Q3" and known exemplars marked "K2" indicating that Canon Image Runner 3225 photocopier was used to produce "Q1" and "Q3". 3.2 Corresponding marks were identified between the questioned documents "Q2" and known exemplars marked "K1" indicating that kodak ESP Office 2170 photocopier was used to produce "Q2".
F3CZQV	1. After an examination I came to the conclusions that the known exemplar marked "K2" was used in the production of the questioned documents marked "Q1" and "Q3". 2. After an examination I came to the conclusions that the known exemplar marked "K1" was used in the production of the questioned documents marked "Q2".
F49A67	Kodak ESP Office 2170 was used to print the questioned document "Q2". Canon Image 3225 was used in the production of "Q1" and "Q3"
FKBM7F	The K2 photocopier was used in the production of the anonymous note Q1. The K1 photocopier was not used in the production of the anonymous note Q1. The K1 photocopier was used in the production of the anonymous note Q2. The K2 photocopier was not used in the production of the anonymous note Q2. The K2 photocopier was used in the production of the anonymous note Q3. The K1 photocopier was not used in the production of the anonymous note Q3
FPB8H8	1. Questioned notes Q1 and Q3 have been made by the same printing element as the undoubted sample K2, copying machine CANON, IMAGE RUNNER 3225 model. 2. Questioned note Q2 has been made by the same printing element as the undoubted sample K1, copying machine KODAK, ESO OFFICE 2170 model. 3. Questioned notes Q1 and Q3 have the same origin, but have been printed in a different direction sense.
FTRMV6	a. Sufficient individual characteristics are present to determine that the documents Laboratory items #3 (Q1) and Laboratory item #5 (Q3), Invoice #Q1121164 were produced by the same machine Laboratory item #2 (K2a-c), Invoice Q1121164. b. Sufficient individual characteristics are present to determine that the document Laboratory item #4 (Q2), Invoice #Q1121164 was produced by the same machine Laboratory item #1 (K1a-c), Invoice Q1121164. c. Sufficient dissimilar class characteristics exist to exclude the possibility of common source between Laboratory item #3 (Q1) and Laboratory item #5 (Q3), Invoice #Q1121164 Laboratory item #1 (K1a-c) Invoice Q1121164. d. Sufficient dissimilar class characteristics exist to exclude the possibility of a common source between Laboratory item #4 (Q2), Invoice #Q1121164 to Laboratory item #2 (K2a-c), Invoice Q1121164.
G2DMU9	QUESTION NOTES MARKED "Q1" AND "Q3" WERE PRODUCED FROM THE SAME PHOTOCOPIER THAT PRODUCED BLANK EXEMPLARS MARKED "K2". QUESTION NOTE MARKED "Q2" WAS PRODUCED FROM THE SAME PHOTOCOPIER THAT PRODUCED BLANK EXEMPLARS MARKED "K1".
G43EY6	The K2 photocopier was used in the production of the Q1 note. The K1 photocopier was used in the production of the Q2 note. The K2 photocopier was used in the production of the Q3 note.
GAUN94	C) RESULTS OF EXAMINATION AND INTERPRETATION: 1. Laboratory items #1-5, Invoice #Q1121167 were digitally imaged for future reference. 2. Laboratory items #1-5, Invoice #Q1121167 were examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Aside from the laboratory number, lab item number, envelope outline, paper outline, or extraneous markings - no impressions were found. 3. Visual and microscopic examination revealed the presence of non-impact print process. a. Laboratory item #1 (K1A-K1C)- Inkjet process; b. Laboratory item #2 (K2A-K2C)- dry toner process; c. Laboratory item #3 (Q1)- Dry toner process; d. Laboratory item #4 (Q2)- Inkjet process; e. Laboratory item #5 (Q3)- Dry toner process. 4. Examination, comparison, and evaluation of the printed material on the questioned

TABLE 3

WebCode	Conclusions
	(Q1, Q2, and Q3) and known samples (K1A-K1C and K2A-K2C) resulted in the following opinion(s): a. Sufficient class and individual characteristics are present on the questioned documents (Laboratory items #3 (Q1) and #5 (Q3), Invoice #Q1121167) to determine that the documents were produced by the same photocopier (Laboratory item #2 (K2A-K2C), Invoice #Q1121167). b. Sufficient class and individual characteristics are present on the questioned document (Laboratory item #4 (Q2), Invoice #Q1121167) to determine that the document was produced by the same photocopier, Laboratory item #1 (K1-K1C), Invoice #Q1121167. c. Sufficient dissimilar class characteristics exist to exclude the possibility of common source between Laboratory items #3 (Q1) and #5(Q3), Invoice #Q1121167 to Laboratory item #1 (K1A-K1C), Invoice #Q1121167. d. Sufficient dissimilar class characteristics exist to exclude the possibility of common source between Laboratory item #4 (Q2), Invoice #Q1121167 to Laboratory item #2 (K2A-K2C), Invoice #Q1121167.
GFJLZU	The documents marked "Q1", "Q3" and "K2" were printed by means of the laser printing process and all have corresponding "trash marks". Thus, the printer used to generate the documents marked "K2" was used to produce the documents marked "Q1" and "Q3" (Canon Image Runner 3225). The documents marked "Q2" and "K1" were printed by means of the inkjet printing process and have corresponding "trash marks". Thus, the printer used to generate the documents marked "K1" was used to produce the document marked "Q2" (Kodak ESP Office 2170).
GFYKT4	Examination, comparison, and evaluation of the print process and photocopier trash marks on the questioned and known samples resulted in the following opinions: a. Sufficient class and individual characteristics are present to determine that questioned documents Q1 (Laboratory item # 3, Invoice # Q1121165) and Q3 (Laboratory item # 5, Invoice # Q1121165) were produced by the same machine as documents K2a-K2c (Laboratory item # 2, Invoice # Q1121165). See pages # 3 and # 5 for interpretation. b. Sufficient dissimilar class characteristics exist to exclude the possibility of common source for questioned documents Q1 (Laboratory item # 3, Invoice # Q1121165) and Q3 (Laboratory item # 5, Invoice # Q1121165) and known documents K1a-K1c (Laboratory item # 1, Invoice # Q1121165). c. Sufficient class and individual characteristics are present to determine that questioned document Q2 (Laboratory item # 4, Invoice # Q1121165) was produced by the same machine as documents K1a-K1c (Laboratory item # 1, Invoice # Q1121165). See page # 4 for interpretation. d. Sufficient dissimilar class characteristics exist to exclude the possibility of common source for questioned documents Q2 (Laboratory item # 4, Invoice # Q1121165) and known documents K2a-K2c (Laboratory item # 2, Invoice # Q1121165).
GQFAR9	On comparison, I found as follows: (i) The questioned notes "Q1" and "Q3" showed similar trash marks in design, spacing and alignment with specimen documents "K2" and dissimilar with specimen documents "K1". Hence, I am of the opinion that these questioned notes were produced by the same source as the specimen document "K2", which is by the copier in the school library and was not produced by the known photocopier that produced specimen documents "K1". (ii) The questioned note "Q2" showed similar trash marks in design, spacing and alignment with specimen documents "K1" and dissimilar with specimen documents "K2". Hence, I am of the opinion that this questioned note was produced by the same source as the specimen document "K2". Hence, I am of the opinion that this questioned note was produced by the same source as the specimen documents "K1", which is by the copier in the yearbook classroom and was not produced by the known photocopier that produced specimen documents "K2".
GVTZ9W	Q1, Q3 and K2 were produced by the same photocopier. Q2 and K1 were produced by the same photocopier.
H2Y78Z	[No Conclusions Reported.]
H387KU	The printer that was used to print specimen documents "K2" was used in the production of questioned documents marked "Q1" and "Q3". The printer that was used to print specimen documents "K1" was used in the production of questioned documents marked "Q2".
H4YTRB	Results of Examinations: Item 1 (Q1) and Item 3 (Q3) were prepared by the same machine that prepared Item 5 (K2). Item 2 (Q2) was prepared by the same machine that prepared Item 4 (K1). No

TABLE 3

WebCode	Conclusions
	indented writing using electrostatic processing/side lighting or watermarks were observed on Item 1 (Q1) through Item 3 (Q3). Additional assessments and observations have been made regarding the submitted items and recorded for possible future examinations.
H78EP4	there is very strong evidence to show that items Q1 and Q3 were produced on the copier item K2. there is strong evidence to show that item Q2 was produced on the copier k1, whilst k1 is the source of the marks found on Q2. I cannot exclude the possibility it has been re-copied using a similar machine.
HCCA94	UPON COMPLETION OF FORENSIC COMPARISONS OF Q-1 THROUGH Q-3 TO K-1 AND K-2, COPY TRASH MARKS WERE FOUND TO BE CONSISTENT WITH BOTH THE LIBRARY AND CLASSROOM PRINTERS AS STATED ON PAGE ON OF THIS REPORT. THE REVERSING OF THE EXEMPLARS WHERE THE PAGES WERE TURNED UPSIDE DOWN REVEALED THE EXACT TRASH MARKS PRESENT ON THE QUESTIONED DOCUMENTS.
HFE4BF	The photocopier Canon Imagerunner 3225 with sample K2 was probably used to print the anonymous note Q1. The photocopier Kodak Esp Office 2170 with sample K1 was probably used to print the anonymous note Q2. The photocopier Canon Imagerunner 3225 with sample K2 was probably used to print the anonymous note Q3.
HQQWKG	The samples of the printed images obtained with the known photocopying machine "K1" are morphotypically consistent with the little printed figures scattered throughout the written questioned note "Q2". The samples of the printed images obtained with the known photocopying machine "K2" are morphotypically consistent with the little printed figures scattered throughout the written questioned notes "Q1" and "Q3".
HT2BA2	Visual, microscopic, and instrumental examination of the submitted documents revealed the following: The copier that generated the known exemplars in Item #1 (K1) was used in the production of the questioned note in Item #4 (Q2). This is based on similarities noted between the questioned and known documents with regards to the unique photocopier trash marks* and toner process. Therefore, this copier was not used in the production of the notes in Items #3 (Q1) and #5 (Q3). The copier that generated the known exemplars in the Item #2 (K2) was used in the production of the questioned notes in Items #3 (Q1) and #5 (Q3). This is based on similarities between the questioned and known documents with regards to the unique photocopier trash marks*, roller marks, and toner process. Therefore, this copier was not used in the production of the noted in Item #4 (Q2). *photocopier trash marks=Repeatable marks that appear on a photocopy that do not originate from the original document, but rather result from either debris or defects somewhere in the image processing or printing mechanism of a particular machine. All items are available for return.
HYBJQ7	The notes Q1 and Q3 are printed with the copier (Canon Image Runner 3225) in the school library as the comparison piece K2. The note Q2 print by the copier (Kodak ESP office 2170) the yearbook classer as the comparison piece K1.
JD37JY	In light of the above mentioned observations I reached the conclusion that the document marked as "K2" is the source of the documents marked as "Q1 and "Q3"" and the document marked as "K1" is the source of the document marked as "Q2".
JN2L3T	The hypotheses considered for each questioned document in relation to each photocopier (PC1 and PC2, where PC1 was used to produce K1 and PC2 was used to produce K2) in this case were as follows: H1: The known photocopier (PC1 or PC2) was used in the production of the questioned document (Q1, Q2 or Q3); and H2: The known photocopier (PC1 or PC2) was not used in the production of the questioned document (Q1, Q2 or Q3). On the basis of the examinations undertaken, I have reached the conclusions that the observations provide extremely strong support for hypothesis H1 over hypothesis H2 with respect to PC2 and each of Q1 and Q3. On the basis of the examinations undertaken, I have reached the conclusion that there is approximately equal support for hypothesis H1 and hypothesis H2 with respect to PC1 and each of Q1 and Q3. By way of further explanation, I found no evidence to suggest that PC1 was used in the reproduction process (or processes) which have led to the production of Q1 and/or Q3, but it is not possible to eliminate either of these possibilities as it is conceivable that PC1 could have been used in an intermediate copying step when the machine was in a

TABLE 3

WebCode	Conclusions
	cleaned or serviced condition leaving no or few trash marks; alternatively a (clean) slit glass scanner (if present) on PC1 could have been used. Thus the results with respect to these propositions are each inconclusive. On the basis of the examinations undertaken, I have reached the conclusion that the observations provide extremely strong support for hypothesis H1 over hypothesis H2 with respect to PC1 and Q2. On the basis of the examinations undertaken, I have reached the conclusion that there is approximately equal support for hypothesis H1 and hypothesis H2 with respect to PC2 and Q2. By way of further explanation, I found no evidence to suggest that PC2 was used in the reproduction process (or processes) which have led to the production of Q2, but it is not possible to eliminate this possibility as it is conceivable that PC2 could have been used in an intermediate copying step when the machine was in a cleaned or serviced condition leaving no or few trash marks; alternatively a (clean) slit glass scanner (if present) on PC2 could have been used. Thus the result with respect to this proposition is inconclusive.
JQQVDF	Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) were examined microscopically with alternate light sources. Exhibits Q1, Q3 and K2 (1) were determined to be prepared using black toner printing technology. Exhibits Q2 and K1 (1) were determined to be prepared using color liquid inkjet printing technology. In addition, the examination of Exhibits Q1, Q2 and Q3 revealed numerous print defects. These variable defects may occur during the manufacture or printing process and may give additional information about the production of the document. A microscopic examination of Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) also revealed a similar pattern of extraneous markings known as "trash marks", which indicate these exhibits originated from a common source. These marks were examined and compared, and the results are as follows: Exhibits Q1 and Q3 were prepared using Exhibit K2 (1). Exhibit Q2 was prepared using Exhibit K1 (1). Please see the attached images for details. The front and back of Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) were examined for the presence of machine-created indentations using the Electrostatic Detection Apparatus (ESDA) with positive results. The machine-created indentations present on Exhibits Q1 and Q3 are of the same type and design as the machine-created indentations present on Exhibit K2 (1). The presence of these indentations further indicates evidence of a common source. Exhibits Q2 and K1 (1) were positive for unknown impressions; however, they were not suitable for comparison. Please see the attached images for details. [Images not provided.]
JQRXV8	[No Conclusions Reported.]
JWW2Y8	AFTER EXAMINATION OF QUESTIONED EXHIBITS Q1,Q2 and Q3 AND EFFECT A COMPARISON WITH THE EXEMPLAR SPECIMENS K1 and K2 I REACHED THE FOLLOWING CONCLUSIONS: 3.1 THE QUESTIONED NOTES MARKED AS Q1 and Q3 WAS PRODUCED BY THE SAME COPIER WHICH PRODUCED EXEMPLARS MARKED K2. 3.2 THE QUESTIONED NOTE MARKED Q2 WAS PRODUCED BY THE SAME COPIER THAT PRODUCED THE EXEMPLARS MARKED K1
JYMNLA	The results of the forensic examination of K1, K2, Q1-Q3 prove, that: the photocopier, represented by K1 was used for the duplication/reproduction of the note Q2. the photocopier, represented by K2 was used for the duplication/reproduction of the notes Q1 and Q3.
K26MM6	After examination I reached the following conclusions: 3.1 The photocopied disputed notes marked "Q1" and "Q3" in an envelope marked "Item Q1/Q2/Q3" were produced by the photocopier that produced "K2A" to "K2C" (Canon Image Runner 3225) as marked by myself. 3.2 he photocopied disputed note marked "Q2" in an envelope marked "Item Q1/Q2/Q3" was produced by the photocopier that produced "K1A" to "K1C" (Kodak ESP Office 2170) as marked by myself
K323UV	After an examination and comparison of the respective materials, I reached the conclusion that the known photocopier was used in the production of the questioned note.
K3Y3KZ	In my opinion, the note Q2 is identified as same source of exemplar K1 printed using ink jet technology - the production of the device in the yearbook classroom. Note Q1, Q3 and blank exemplar K2 were produced with toner from the same photocopier in the school library.
KFNARW	After an examination and comparison of the respective documents I reached the conclusion that the documents in question marked as "Q1" and "Q3" were produced utilising the known photocopier which produced the specimen material marked as "K2(a)" to "K2(c)" (i.e. "Cannon Image Runner 3225") and

TABLE 3

WebCode	Conclusions
	that the document in question marked as "Q2" was produced utilising the known photocopier which produced the specimen material marked as "K1(a)" to "K1(c)" (i.e. "Kodak ESP Office 2170") due to the following observations: 1. The visual observation and identification of corresponding defects which occurs on the documents. 2. The corresponding measurements of the identified defects in respect of their location and alignment on the documents.
KFPWXT	The known photocopier associated with the documents K2 was used to produce the questioned documents Q1 and Q3. This photocopier was not used to produce the Q2 document. The known photocopier associated with the documents K1 was used to produce the questioned document Q2. This photocopier was not used to produce Q1 and Q3 documents.
KJN4KC	Upon completion of an examination of the submitted standards, this examiner opines that Q-1 and Q-3 exhibits were produced using the K2 (Library) photocopier, while the Q-2 was produced using the K1 (Classroom) photocopier.
KJNHZC	Analysis and observation above position of notes known as Q1 and Q3, total coincidence of the spots and blotches, (traces of waste) is observed with those found in the samples taken to the photocopier Canon image runner 3225 of the library, which they still have a same shape and location on the sheet. Therefore it is sufficient evidence to determine that the notes were mad on this machine. Same result was obtained by comparing the characteristics of use produced by the identified as K1 photocopier and the note identified as Q2, therefore this document was prepared in the Kodak ESP Office 2170 photocopier
KQMPAQ	The production of the K2 exemplars and the questioned documents, Q1 and Q3, were by the same toner printing machine. This is evidenced by marks and impressions produced by the printing machine. The production of the K1 exemplars and the Q2 questioned document were by the same inkjet printing machine. This is evidenced by the marks produced by the printing machine.
KUB3D3	The K1 photocopier was used to produced the questioned note Q2. The K2 photocopier was used to produced the questioned note Q3. The K2 photocopier was used to produced the questioned note Q1. The findings related to the elements in Q1 that are additional to the mark or trace left by K2. are explained in Item 4.
KZCGWJ	In my opinion, the evidence provides very strong support for the proposition that the questioned note Q2 was produced on the known copier of K1 (classroom), and the questioned notes Q1 and Q3 were produced on the known copier of K2 (Library). In my opinion, the evidence provides very strong support for the proposition that the questioned note Q2 was not produced on the known copier of K2 (Library), and the questioned notes Q1 and Q3 were not produced on the known copier K1 (classroom).
L7GF6M	A multifaceted examination was conducted to determine if the photocopiers identified as K1 and K2 were used in the production of the documents labeled Q1, Q2, and Q3. The following examinations were conducted: a macroscopic and microscopic examination; an indented impression examination; a print process classification; and a paper comparison. Results for Photocopier K1: The printed material on the document labeled Q2 and known standards from the photocopier identified as K1 was produced from a device using inkjet technology, which included at least cyan, yellow, magenta, and black ink. An individualizing pattern of trash marks was present on these pages and aligned when overlaid. Trash marks are defined as marks appearing on a photocopy that do not originate from the original document but rather result from either debris or a defect somewhere in the imaging process or printing mechanism. No physical or optical differences were observed between the document labeled Q2 and known standards from the photocopier identified as K1. Similarities in class features such as color, physical dimensions, optical brightener, and paper fiber distribution were observed as well as the lack of watermarks. Therefore, the document labeled Q2 and the known standards from the photocopier identified as K1 are from a common source, meaning photocopier K1 was involved in the production of the document labeled Q2. Different print processes and a different pattern of trash marks were observed during the comparison of the documents labeled Q1 and Q3 to the known standards from the photocopier identified as K1. Therefore, it is probable that the photocopier identified as K1 was not involved in the production of the documents labeled Q1 and Q3. Results for Photocopier K2: The printed material on the documents labeled Q1 and Q3 and the known standards from the photocopier identified as K2 was produced from a device using black toner technology. An individualizing pattern of

TABLE 3

WebCode	Conclusions
	<p>trash marks was present on these pages and aligned when overlaid. Indented impressions of at least two horizontal lines were visible with side lighting on the documents labeled Q1 and Q3 and the known standards from the photocopier identified as K2. Additional horizontal lines and a band of vertical lines approximately 1 1/8" long developed across the middle of these pages on the electrostatic detection device (EDD) lifts that were produced during the indented impression examination of the documents labeled Q1 and Q3 and the known standards from the photocopier identified as K2. These lifts were labeled Q1A1, Q1A2, Q3A1, Q3A2, and K1A1 – K1A6. No physical or optical differences were observed between the documents labeled Q1 and Q3 and known standards from the photocopier identified as K2. Similarities in class features such as color, physical dimensions, optical brightener, and paper fiber distribution were observed as well as the lack of watermarks. Therefore, the documents labeled Q1 and Q3 and the known standards from the photocopier identified as K2 are from a common source, meaning photocopier K2 was involved in the production of the documents labeled Q1 and Q3. Different print processes and a different pattern of trash marks were observed during the comparison of the document labeled Q2 to the known standards from the photocopier identified as K2. Therefore, it is probable that the photocopier identified as K2 was not involved in the production of the document labeled Q2.</p>
LECFKF	<p>"Q1", "Q3" and "K2" 1. When "Q1", "Q3" and the three sheets in "K2" were compared with one another, similarities in the following features were found among them: i. Physical and optical properties of paper ii. Printing process used iii. Relative positions and shapes of trash marks 2. The evidence shows that "Q1" and "Q3" were printed by the same machine that was used to produce the printing on "K2". "Q2" and "K1" 3. When "Q2" and the three sheets in "K1" were compared with one another, similarities in the following features were found among them: i. Physical and optical properties of paper ii. Printing process used iii. The use of inks of four colour - cyan, magenta, yellow and black – to form images iv. Relative positions and shapes of trash marks 4. The evidence shows that "Q2" was printed by the same machine that was used to produce the printing on "K1".</p>
LJ3PUD	<p>Exhibits Q1, Q2, Q3, K1 (1-3) and K2 (1-3) were examined visually, microscopically, and with a digital overlay technique in Adobe Photoshop. A similar pattern of extraneous markings known as "trash marks" were noted on Exhibits Q1, Q3, and K2 (1-3) indicating these exhibits originated from a common source. Likewise, a similar pattern of "trash marks" was noted on Exhibits Q2 and K1 (1-3) indicating these exhibits originated from a common source. The two trash mark patterns noted were distinct from one another. "Trash marks" are printing imperfections that may be transmitted on to a document as a result of marks, scratches, debris or flaws within the printing system and may be identifiable to the particular machine that produced them. Further microscopic examination of Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) determined the use of two different printing processes. Exhibits Q1, Q3 and K2 (1) were prepared using black toner printing technology. Exhibits Q2 and K1 (1) were prepared using color liquid inkjet printing technology. Note: Exhibits K1 (1) and K2 (1) were used as a representative sample of the known standards submitted as Exhibits K1 and K2. Additionally, print defects were noted on Exhibits Q2 and K1 (1-3). These print defects were of the same type and gave further evidence that Exhibits Q2 and K1 (1-3) originated from a common source. Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) were examined for the presence of handwriting and/or machine-generated indentations with the Electrostatic Detection Apparatus (ESDA). The fronts and backs of Exhibits Q1, Q3 and K2 (1) were positive for machine-generated indentations. ESDA lifts created from the fronts and backs of Exhibits Q1, Q3, and K2 (1) were compared. The machine-generated indentations were of a similar pattern and design and gave evidence that Exhibits Q1, Q3, and K2 (1) originated from a common source. Note: Exhibits K1 (1) and K2 (1) were used as a representative sample of the known standards submitted as Exhibit K1 and K2. Exhibits Q2 and K1 (1) were positive for unknown impressions but were not suitable for comparison. Digital images of the ESDA lifts created from the fronts and backs of Exhibits Q1, Q3, and K2 (1) were examined using a digital overlay technique in Adobe Photoshop. The machine-generated indentations overlaid exactly giving further evidence of a common source between Exhibits Q1, Q3, and K2 (1). Exhibits Q1, Q2, Q3, K1 (1) and K2 (1) were examined visually, and with infrared, infrared luminescent, ultraviolet, and transmitted light sources and no differences were noted in the paper. Exhibits Q1, Q2, Q3, K1 (1-3), K2 (1-3) and the original ESDA indentation lifts were digitally scanned.</p>
LLA8TA	<p>For machine K1: Either the questioned note Q2 itself or a previous generation was produced by the</p>

TABLE 3

WebCode	Conclusions
	<p>known photocopier K1. Q2 and the exemplars from copier K1 have class and individual characteristics in common. The class characteristics include: The submitted samples from K1 and document Q2 were produced via an inkjet process. Similar optical properties were observed on both the paper and the printed material when Q2 and the samples from K1 were subjected to an alternate light source examination. The individual characteristics include: Voids in the form of horizontal banding were present in the printed material on both the samples from K1 and on Q2. A pattern of marks or defects is found on the samples from K1 and on Q2. These defects are present in the same pattern and on the same location on Q2 and on the submitted samples from K1. These marks or defects result from debris or a defect somewhere in the image processing or printing mechanism of a machine and appear on copies produced by this machine until the defect is fixed or the debris is removed. Photocopier K1 was not used to produce the submitted version of Q1 or Q3. K2 prints via an inkjet process and Q1 and Q3 were produced via a toner process. For machine K2: Either the questioned notes Q1 and Q3 themselves or a previous generation were produced by the known photocopier K2. Q1, Q3, and the exemplars from copier K2 have class and individual characteristics in common. The class characteristics include: The submitted samples from K2 and documents Q1 and Q3 were produced via a toner print process. Similar optical properties were observed on both the paper and the printed material when Q1, Q3, and the samples from K2 were subjected to an alternate light source examination. Horizontal bands that may be attributable to the machine's paper transport mechanism were developed on Q1, Q3, and the samples from K2 when the documents were submitted to an indented impression examination and an examination using oblique lighting. The individual characteristics include: A pattern of marks or defects is found on the samples from K2 and on Q1 and Q3. These defects are present in the same pattern and on the same location on Q1, Q3, and on the submitted samples from K2. These marks or defects result from debris or a defect somewhere in the image processing or printing mechanism of a machine and appear on copies produced by this machine until the defect is fixed or the debris is removed. Photocopier K2 was not used to produce the submitted version of Q2. K2 prints via a toner process while Q2 was produced via an inkjet process.</p>
LP7ZHX	<p>1.) My observations lead me to conclude that the Canon Image Runner 3225 photocopier that produced the samples, item K2, was involved in the production of the two questioned notes, items Q1 and Q3. 2.) My observations lead me to conclude that the Kodak ESP Office 2170 photocopier that produced the samples, item K1, was involved in the production of the questioned note, item Q2.</p>
LP9LDD	<p>In my opinion, there is conclusive evidence to support the proposition that copier K1 was used to copy the anonymous note Q2. In my opinion, there is conclusive evidence to support the proposition that copier K2 was used to copy the anonymous notes Q1 and Q3.</p>
LP9X7V	<p>The copier used to produce Item 4 (K1) was used in the production of Item 2 (Q2) due to similar inkjet printing technology and the morphological marking similarities of the excess ink. The copier used to produce Item 5 (K2) was used in the production of Item 1 (Q1) and Item 3 (Q3) due to similar toner printing technology and the morphological marking similarities of the excess toner. No indented writing was observed on Items 1 through 3 (Q1-Q3) using side-lighting and the Electrostatic Detection Apparatus (ESDA).</p>
LUGLGB	<p>1. The photocopier that produced blank exemplar marked "K1" was also used to produce questioned note marked "Q2". 2. The photocopier that produced blank exemplar marked "K2" was also used to produce the two questioned notes marked "Q1" and "Q3". 3. The photocopier that produced blank exemplar marked "K1" was not used to produce the two questioned notes marked "Q1" and "Q3". 4. The photocopier that produced blank exemplar marked "K2" was not used to produce questioned note marked "Q2".</p>
M3BCVC	<p>It was determined that the notes, Q-1 and Q-3, originated on the Canon Image Runner 3225 copier, K-2. It was also determined that the note, Q-2, originated on the Kodak ESP Office 2170 copier, K-1.</p>
M7BKYM	<p>Visual, optical, and instrumental examinations were conducted on the five submitted items using various lighting sources, a stereomicroscope, and the electrostatic detection apparatus (ESDA). It is the conclusion of this examiner that Items 3 (Q1) and 5 (Q3) were produced using the Item 2 (K2) copier at some point in the production process. This determination was reached by observing the overt and subtle</p>

TABLE 3

WebCode	Conclusions
	characteristics of the trash marks found as small extraneous images on Items 3 and 5 and the known copies produced and submitted as Item 2. It is also the conclusion of this examiner that Item 2 (Q2) was produced using the Item 1 (K1) copier at some point in the production process.
N47EY8	In examining documents Q1, Q3 and K2, it was found that these documents were printed in black toner. Further more, I found printing defects that are common in shape, size, location and relative position among the documents Q1, Q3 and K2. In my opinion, documents Q1 and Q3 originated from the same copier that produced documents K2. In examining documents Q2 K1, it was found that these documents were printed in inkjet. Further more, I found printing defects that are common in shape, size, location and relative position among the documents Q2 and K1. In my opinion, document Q2 originated from the same copier that produced documents K1.
NHYJB4	After analysis and comparison of the sampler and documents in question, I therefore conclude that: i) the copier of the yearbook classroom (for exemplar "K1") produced notes marked "Q2" and ii) The copier in the school library (for exemplar "K2") produced notes marked "Q1" and "Q3"
NK7Z6T	The questioned items 'Q1' and 'Q3' have the exact markings on the substrate as the exemplar 'K2' and the questioned item 'Q2' has the exact markings on the substrate as the exemplar 'K1'. This prove that the questioned notes marked 'Q1' and 'Q3' were produced from the copier in the library (Canon Image Runner 3225) and the questioned note marked 'Q2' was produced from the copier in the yearbook classroom (Kodak ESP Office 2170).
NKPELW	[No Conclusions Reported.]
NLLNXL	1. Exhibit 1 and Exhibits 5(1-3) have significant characteristics in agreement. The possibility of observing the same combination of characteristics in agreement from another printer/copier is considered extremely low. 2. Exhibit 1 and Exhibits 4(1-3) have significant characteristics that are not in agreement. It is considered extremely unlikely that the printer/copier used to produce Exhibits 4(1-3) produced Exhibit 1. 3. Exhibit 2 and Exhibits 4(1-3) have significant characteristics in agreement. The possibility of observing the same combination of characters in agreement from another printer/copier is considered extremely low. 4. Exhibit 2 and Exhibits 5(1-3) have significant characteristics that are not in agreement. It is considered extremely unlikely that the printer/copier used to produce Exhibits 5(1-3) produced Exhibit 2. Exhibit 3 and Exhibits 5(1-3) have significant characteristics in agreement. The possibility of observing the same combination of characteristics in agreement from another printer/copier is considered extremely low.
NQGDJZ	Result 1: When carrying out the analysis of the anonymous notes, identified as "Q1" and "Q3"; and when compared with the comparison element identified "K2", it was determined that they have characteristics of a laser printing system, in addition, they coincide in terms of the marks of the printing defects (satellites), the optical behavior of the ink, the pattern of physical marks of the printing system and the characteristics of the support. Result 2: When carrying out the analysis of the anonymous note, identified as "Q2" and comparing it with the comparison element identified as "K1", it was determined that they have the characteristics of an inkjet printing system, in addition, they coincide in Regarding the marks of printing defects (satellites), the optical behavior of the ink and the characteristics of the support.
NQVFL	Based on the aforementioned observations, I came to the following conclusions: 1 The trash marks on the documents marked "Q1" and "Q3" were generated by the same printer that generated the trash marks on the documents marked "K2". 2 The trash marks on the document marked "Q2" were generated by the same printer that generated the trash marks on the documents marked "K1".
P2AFXD	The Q1 and Q3 documents have been produced using a toner printing process. The K2 copier utilises a toner printing process. The Q1 and Q3 documents share both common trashmarks and printer/roller mark indentations with the K2 samples. Therefore, the K2 was used in the production of the Q1 and Q3 documents. The Q2 document has been produced using an inkjet printing process. The K1 copier utilises an inkjet printing process. Q2 share common trashmarks with the K1 samples. Therefore, K1 was used in the production of the Q2 document.

TABLE 3

WebCode	Conclusions
PCQ6WJ	Exhibits Q1 and Q3, or documents from which they derive, were produced by the machine that produced Exhibits K2.1 through K2.3. This opinion is based on individualizing features (i.e., trash marks), as well as class characteristics (e.g., wheel, band, or roller marks), which were found to be in common between the question documents and the known documents. Exhibit Q2, or a document from which it derives, was produced by the machine that produced Exhibits K1.1 through K1.3. This opinion is based on individualizing features (i.e., trash marks), which were found to be in common between the question document and the known documents. Documents Q1, Q2, and Q3 were examined for the presence of indented writing. None was found.
PQBHDY	The copier that produced the K2 exemplars was used in the production of the Q1 and Q3 documents and was not used in the production of Q2 document. The copier that produced the K1 exemplars was used in the production of the Q2 document and was not used in the production of Q1 and Q3 documents.
PQCWNT	After examination and comparison with the questioned documents with reference material I reached the following conclusions: 1. Due to the observation and presence of correspondences in relation to visible defects (referring to similar appearance, size and placement of the defects/marks) on "Q1" and "Q3" and the specimen material marked "K2a" to "K2c", the questioned "NOTES" marked "Q1" and "Q3" were produced with "school library" photocopier ("Canon Image Runner 3225"). 2. Due to the observation and presence of correspondences in relation to visible defects (referring to similar appearance, size and placement of the defects/marks) on "Q2" and the specimen material marked "K1a" to "K1c", the questioned "NOTE" marked "Q2" was produced with "yearbook classroom" photocopier ("Kodak ESP Office 2170").
PUCZH2	I reached a conclusion that the known photocopier was used in the production of the questioned note.
PV6GMN	Based on the observed similarities in the printing process and printer trash marks between the question document Q2 and the specimen documents of K1, I have concluded the printer that produced the specimen documents of K1 was used in the production of the questioned document Q2. Based on the observed similarities in the printing process, printer trash marks and printer roller impressions between the questioned documents Q1 and Q3 and the specimen documents of K2, I have concluded the printer that produced the specimen documents of K2 was used in the production of the questioned documents Q1 and Q3.
PX9ALT	[No Conclusions Reported.]
Q2MJGQ	It was determined that Item 4 (K1) Kodak ESP Office 2170 copier was used in the final production of Item 2 (Q2) ink jet generated document, "Note left on December 12, 2017, reading "Doug Miller...". It was determined that Item 5 (K2) Canon Image Runner 3225 copier was used in the final production of Item 1 (Q1) toner generated document, "Note left on December 4, 2017, reading "Mr. Miller..." and Item 3 (Q3) toner generated document, "Note left on December 15, 2017, reading "Leave \$5000...". It was determined that Item 4 (K1) Kodak ESP Office 2170 copier was not used in the final production of Item 1 (Q1) toner generated document, "Note left on December 4, 2017, reading "Mr. Miller..." and Item 3 (Q3) toner generated document, "Note left on December 15, 2017, reading "Leave \$5000...". It was determined that Item 5 (K2) Canon Image Runner 3225 copier was not used in the final production of Item 2 (Q2) ink jet generated document, "Note left on December 12, 2017, reading "Doug Miller...". No indented writing was observed on the Item 1 (Q1), Item 2 (Q2) and Item 3 (Q3) notes using side-lighting and the Electrostatic Detection Apparatus (ESDA). Should the originals of Item 1 (Q1), Item 2 (Q2), and Item 3 (Q3) be located, along with original known paper fragments, they should be submitted for a cut edge examination.
Q3MAFY	1) The trashmarks from the questioned notes "Q1" and "Q3" corresponded in design and position with trashmarks from the specimens "K2". Hence, I am of the opinion that the photocopier, as represented by the known exemplars "K2" was used in the production of these questioned notes. 2) The trashmarks from the questioned notes "Q1" and "Q3" did not correspond in design and position with trashmarks from the specimens "K1". Hence, I am of the opinion that the photocopier, as represented by the known

TABLE 3

WebCode	Conclusions
	<p>exemplars "K1" was not used in the production of these questioned notes. 3) The trashmarks from the questioned note "Q2" corresponded in design and position with trashmarks from the specimens "K1". Hence, I am of the opinion that the photocopier, as represented by the known exemplars "K1" was used in the production of this questioned note. 4) The trashmarks from the questioned note "Q2" did not correspond in design and position with trashmarks from the specimens "K2". Hence, I am of the opinion that the photocopier, as represented by the known exemplars "K2" was not used in the production of this questioned note.</p>
QD4WPZ	Q1 and Q3 are in all probability printed by printer K2. Q2 is in all probability printed by printer K1.
QDZH3L	IN CONCLUSION, I FOUND EVIDENCE TO PROVIDE STRONG SUPPORT FOR THE PROPOSITION THAT: 1. THE NOTE IN QUESTION MARKED AS 'Q1' WAS NOT PRODUCED BY TWO (2) KNOWN PHOTOCOPIERS MARKED 'K1 AND K2'. 2. THE QUESTIONED NOTE MARKED AS 'Q2' WAS PRODUCED BY THE KNOWN PHOTOCOPIER MARKED "K1". 3. THE QUESTIONED NOTE MARKED AS 'Q3', WAS PRODUCED BY THE KNOWN PHOTOCOPIER MARKED 'K2'.
QFAQER	It was determined that the Item 1 (Q1) and Item 3 (Q3) documents were produced using the same office machine that produced the Item 5 (K2) exemplars due to agreement in identifying characteristics. It was determined that the Item 2 (Q2) document was produced using the same office machine that produced the Item 4 (K1) exemplars due to agreement in identifying characteristics. No indented writing was observed on Items 1 through 3 (Q1 through Q3) using electrostatic processing and side lighting.
QNYAEY	Technical findings support the proposition that Q1 & Q3 notes have been produced by Canon IR 3225 printer located in the school library. Technical findings support the proposition that Q2 extortion note has been produced Kodak ESP Office 2170 printer located in the yearbook classroom.
QNZCH6	Preliminary analysis among the disputed documents, where is evidence that identified as Q1 and Q3 documents were reproduced by the same Copier and Q2 corresponds to another photocopying was initially ahead. Followed this with the support of specialized laboratory equipment comparison pattern, was the comparison between the documents of doubt and the samples allowing you to appreciate that the notes threatening Q1 and Q3 are identified with genuine copies reproduced in the library (K2), it shows the same morphology and location of the traces which leaves this photocopy machine. With respect to the threatening note Q2 is identified with signs of the photocopier in the classroom (K1) Therefore it is concluded that Q1 and Q3 documents were reproduced in the K2 photocopier and Q2 document was reproduced in Copier K1
R877P2	The questioned documents marked "Q1" and "Q3" were produced from the copier in the library (Canon Image Runner 3225) The questioned document marked "Q2" is produced from the copier in the yearbook classroom (Kodak ESP Office 2170).
RBMVN6	The physical characteristics correspond between the doubt document (Q2) and the standard sample collected in three blank copies produced by the photocopier in the yearbook room (K1). The physical characteristics correspond between the doubt documents (Q1 y Q3) and the standard sample collected in three blank copies produced by the photocopier of the school library (K2).
RDX2JY	1. The findings provide extremely strong support for the proposition that Items Q1 and Q3 were produced using the K2 copier (Canon Image Runner 3225), rather than these items being produced using some other device, eg., K1. 2. The findings provide extremely strong support for the proposition that Item Q2 was produced using the K1 copier (Kodak ESP Office 2170), rather than it being produced using some other device, eg., K2.
RLVURT	Sufficient class and individual characteristics are present to determine that the documents Q1 and Q3 were produced by the same machine as K2 (K2A-K2C). Sufficient class and individual characteristics are present to determine that the documents Q2 was produced by the same machine as K1 (K1A-K1C). Sufficient dissimilar class and individual characteristics (in Q1 and Q3) exist the exclude the possibility of a common source (to K1 (K1A-K1C)). Sufficient dissimilar class and individual characteristics (in Q2) exist the exclude the possibility of a common source (to K2 (K2A-K2C)). Visual and microscopic examination revealed the presence of non-impact print process: K1 (K1A-K1C) - color inkjet, K2

TABLE 3

WebCode	Conclusions
	(K2A-K2C) - black dry toner, Q1 - black dry toner, Q2 - color inkjet, Q3 - black dry toner. K2(K2A-K2C Back), Q1 Back and Q3 Back were examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Multiple impressions were found. See pages 3, 4 and 5 for interpretation. K1 (K1A-K1C Front and Back), K2 (K2A-K2C Front), Q1 Front, Q2 Front and Back and Q3 Front were examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Aside from the laboratory number, lab item number, envelope outline, paper outline, or extraneous markings - no impressions were found.
RU66YY	FIRST: PHOTOCOPIES IN QUESTIONED DOCUMENTS DOCUMENTS Q1 AND Q3 WERE PRODUCED BY THE SAME PHOTOCOPIER THAT PRODUCED DOCUMENT FOR COMPARISON B, IDENTIFIED AS K2. SECOND: PHOTOCOPY IN QUESTIONED DOCUMENT Q2 WAS PRODUCED BY THE SAME PHOTOCOPIER THAT PRODUCED DOCUMENT FOR COMPARISON A, IDENTIFIED AS K1.
RWQ3BV	The trash mark constellations on the document labeled Q-1 conformed in shape and position with those on the known sample labeled K-2. Similarly, the document labeled Q-2 had trash marks matching those on known sample K-1. The document identified as Q-3 had random toner marks matching known sample K-2. The odds of having several trash marks coincide in shape and location on both a questioned and known document are statistical improbable.
RXJ34Z	Base on the examination, it is determined that the known photocopier K2 (Canon Image Runner 3225) was used in the production of the questioned note Q1 and Q3. However, the known photocopier K1 (Kodak ESP Office 2170) was used in the production of the questioned note Q2.
T4LCBT	The k 2 photocopier was used in the production of the Q1 and Q3 note. the k1 photocopier was used in the production of the Q2 note.
T7AVZX	There is a strong probability that the device used to produce the K1 exemplars was used to produce document Q2. There is a strong probability that the device used to produce the K2 exemplars was used to produce documents Q1 and Q3.
TLADCQ	[No Conclusions Reported.]
TPNBGR	RESULTS OF EXAMINATION AND INTERPRETATION: 1. Laboratory item #s 1, 2, 3, 4 and 5, Invoice# Q1121169 were digitally imaged for future reference. 2. Laboratory item #1 (K1) and Laboratory Item #2 (K2b) Invoice# Q1121169 were visually examined utilizing oblique/side lighting for the possible presence of indented impressions. Aside from the laboratory number, lab item number, envelope outline, paper outline or extraneous markings - no impressions were found. 3. Laboratory item #2 (K2a back, K2c front and back), and Laboratory item #3 (Q1 back and Q1 back second lift), Laboratory item #5 (Q3 back) Invoice# Q1121169 were examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Multiple impressions were found. Laboratory item #2 (K2c back), Laboratory item #3 (Q1 back - second lift) and Laboratory item #5 (Q3 back) are representative samples for reporting purposes. See pages 4, 5, and 6 for interpretation. 4. Laboratory item #2 (K2a front) and Laboratory item #3 (Q1 front), Laboratory item #4 (Q2 front and back), Laboratory item #5 (Q3 front), Invoice# Q1121169 were examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Aside from the laboratory number, lab item number, envelope outline, paper outline or extraneous markings - no impressions were found. 5. Visual and microscopic examination revealed the presence of non-impact print process as follows: Laboratory item #1 (K1a, K1b, K1c) Inkjet process; Laboratory item #2 (K2a, K2b, K2c) Dry toner process; Laboratory item #3 (Q1) Dry toner process; Laboratory item #4 (Q2) Inkjet process; Laboratory item #5 (Q3) Dry toner process. 6. Examination, comparison, and evaluation of the printed material on the questioned documents and known samples resulted in the following opinion (s): A.) Sufficient individual characteristics are present on the questioned documents Laboratory item #3 (Q1) and item #5 (Q3), Invoice #1121169 to determine that the documents were produced by the same photocopier, Laboratory item #2 (K2), Invoice Q1121169. B.) Sufficient individual characteristics are present on the questioned document Laboratory item #4 (Q2),

TABLE 3

WebCode	Conclusions
	Invoice #1121169 to determine that the document was produced by photocopier, Laboratory item #1 (K1), Invoice Q1121169. C.) Sufficient dissimilar class characteristics exist to exclude the possibility of common source between Laboratory item #3 (Q1) and item #5 (Q3), Invoice #1121169 to Laboratory item #1 (K1), Invoice Q1121169. D.) Sufficient dissimilar class characteristics exist to exclude the possibility of common source between Laboratory item #4 (Q2), Invoice #1121169 to Laboratory item #2 (K2), Invoice Q1121169.
TZJ3TJ	The photocopied note Q1 was produced by the photocopier that produced the known exemplars of K2 and not K1. The photocopied note Q2 was produced by the photocopier that produced the known exemplars of K1 and not K2. The photocopied note Q3 was produced by the photocopier that produced the known exemplars of K2 and not K1.
U8K6JH	In light of the above observations I came to the following conclusions: The evidence at hand supports the proposition that questioned documents marked "Q1" and "Q3" was produced using the printer that produced specimen documents marked "K2". The evidence at hand supports the proposition that the questioned document marked "Q2" was produced using the printer used to produce specimen documents marked "K1".
UG8Y27	The questioned notes Q1 and Q3 were produced using a photocopier K2 (Canon Image Runner 3225). The questioned note Q2 was produced using a photocopier K1 (Kodak ESP Office 2170).
UL2ZWT	Q1 and Q3 were copied on photocopier K2. Q2 was copied on photocopier K1
UNR23G	The incidental marks on the documents marked "Q1" and "Q3" are identical to those on the exemplars marked as "K2". I, thus, found the evidence to support the proposition that the documents marked "Q1" and "Q3" were reproduced by the same copier as that which produced the exemplars marked "K2". The incidental marks on the document marked "Q2" are identical to those on the exemplars marked as "K1". I, thus, found the evidence to support the proposition that the document marked "Q2" was reproduced by the same copier as that which produced the exemplars marked "K1".
UP3DWY	I reached the conclusion that the questioned documents marked "Q1" and "Q3" were produced from the copier in the library (Canon Image Runner 3225) and the questioned document marked "Q2" was produced from the copier in the yearbook classroom (Kodak ESP Office 2170).
UPJRY3	The questioned document Q1 and Q3 correspond with the K2 sample. The questioned document Q2 correspond with the K1 sample
UTNLB8	The questioned letters Q1 and Q3 have been produced using a black electrostatic printing process. The samples from the Canon ImageRunner 3225 copier (K2) have also been produced using this printing process. The questioned letter Q2 has been produced using a colour inkjet printing process. The samples from the Kodak ESP Office 2170 copier (K1) have also been produced using this printing process. The questioned letters Q1 and Q3 contain a large number of distinctively shaped image faults in common. These faults are consistent with having resulted from marks on the glass platen of a photocopier/scanner. The same pattern of marks was also present on the samples taken from the Canon ImageRunner 3225 copier (K2). Based on their correspondence in size, shape and relative position, it is my opinion that the Canon ImageRunner 3225 copier was used in the production of the letters Q1 and Q3. The questioned letter Q2 contains a large number of distinctively shaped image faults that are consistent with having resulted from marks on the glass platen of a photocopier/scanner. The same pattern of marks was also present on the samples taken from the Kodak ESP Office 2170 copier (K1). Based on their correspondence in size, shape and relative position, it is my opinion that the Kodak ESP Office 2170 copier was used in the production of the letter Q2.
VA6793	Items Q1 and Q3, or copies from which they may have been made, were produced by the same machine as Item K2. This opinion is based on the notation of toner defects in the same pattern on all copies; and what appear to be horizontally positioned machine roller marks in the middle of the pages, and more faint markings toward the top and bottom edges of the pages. Item Q2, or a copy from which it may have been made, was produced by the same machine as Item K1. This opinion is based on the notation of inkjet defects in the same pattern on all copies and the creation of the copies via a four-color

TABLE 3

WebCode	Conclusions
	copy system, of which is the Kodak, K1, machine. No decipherable characters, symbols, or signs were noted in indented form on Items Q1, Q2, or Q3.
VFB6G8	Our technical results suggest that: Q1 and Q3 were printed on copier K2 in the school library (Canon image Runner 3225). Q2 was produced by the copier K1 in the yearbook classroom (Kodak ESP Office 2170)
VTXMGK	The copier used to produce Item 4 (K1) was identified as being used in the production of Item 2 (Q2) based on the corresponding inkjet printing processes and the constellations and morphological similarities of the excess ink. The copier used to produce Item 5 (K2) was identified as being used in the production of Items 1 and 3 (Q1 and 3 respectively) based on the corresponding black toner printing processes and the constellations and morphological similarities of the excess toner. No indented writing was observed on Items 1 through 3 (Q1-3) utilizing side-lighting and the Electrostatic Detection Apparatus.
VX8DRY	At his level of examination, it has been concluded that the K1 office machine copier was used in the production of the questioned Q2 note. Likewise, it has been concluded that the K2 office machine copier was used in the production of the questioned Q1 and Q3 notes. In order to determine if a subsequent office machine copier was also used a chemical analysis of the ink/toner is suggested.
W4TH97	The photocopier K1, in the classroom, was used in the production of the questioned note Q2. The photocopier K2, in the library, was used in the production of the questioned notes Q1 and Q3.
W8ABWD	The same copier that produced K1 also produced Q2. The same copier that produced K2 also produced Q1 and Q3.
WLTAW8	The known photocopiers were used in the production of the questioned notes due to the following observations: Item K1 when superimposed with questioned note item Q2 have both marks/dots that appear to have the same pattern. Item K2 when superimposed with questioned note item Q1 have both marks/dots that appear to have the same pattern. Item K2 when superimposed with questioned note item Q3 have both marks/dots that appear to have the same pattern
WLWRWR	I reached a conclusion that the known photocopier of exemplar "K1" was used in the production of questioned note "Q2" and the known photocopier of exemplar "K2" was used in the production of questioned note "Q1" and "Q3". My conclusion is based on the following observations:
WNGCQE	From the above observations, I came to the following conclusions: The evidence obtained supports the proposition that the questioned documents marked "Q1" and "Q3" were produced using the printer that produced specimen documents marked "K2". The evidence obtained supports the proposition that the questioned document marked "Q2" was produced using the printer used to produce specimen documents marked "K1".
WPK6Q	1. Diffuse impressions placed on the surface of the left note of december 4, 2017 (Q1) and the note left december 15, 2017 (Q3), present a perfect case with K2 sheet prints, indicating to be part of the same photocopier machine. 2. Diffuse impressions placed on the surface of the left note of december 12, 2017 (Q2), presents a perfect case with K1 sheet prints, indicating to be part of the same photocopying machine.
WPW3TR	AFTER EXAMINATION AND COMPARISON I REACHED THE CONCLUSION THAT THE KNOWN PHOTOCOPIERS MARKED AS "K1" AND "K2" WERE USED IN THE PRODUCTION OF THE QUESTIONED NOTES MARKED AS "Q1","Q2" AND "Q3".
WTENT7	Based wholly or substantially on my specialised knowledge, I am of the opinion that: a) K2, Q1 and Q3 each contain a black toner print process displaying similar characteristics indicative of having been produced by the same printer. b) Q2 and K1 both contain a colour inkjet print process indicative of having been produced from the same printer.
WVHGNQ	According to the analyzes performed, to the material contributed, the reference patterns used for the present study and the technical reasons explained above determine that: Q1 was produced by the library

TABLE 3

WebCode	Conclusions
WWBP2V	<p>photocopier (K2) Q2 was produced by the yearbook classroom photocopier (K1) Q3 was produced by the library photocopier (K2)</p> <p>AFTER EXAMINATION OF THE QUESTIONED NOTES MARKED "Q1", "Q2" and "Q3" AND COMPARISON WITH THE BLANK EXEMPLARS MARKED "K1" and "K2", THE FOLLOWING OBSERVATIONS WERE MADE: 3.1. THE QUESTIONED NOTE MARKED Q1 and Q3 HAS THE SAME IDENTIFICATION MARKS AS THE EXEMPLARS MARKED "K2". 3.2 THE QUESTIONED NOTE MARKED Q2 HAS THE SAME IDENTIFICATION MARKS AS THE EXEMPLARS MARKED "K1". IN LIGHT OF THE ABOVE MENTIONED OBSERVATIONS, I REACHED THE CONCLUSION THAT: The documents marked Q1 and Q3 were produced on the same copier which produced the exemplars marked "K2". The document marked Q2 was produced on the same copier which produced the exemplars marked "K1"</p>
XM23JZ	<p>An examination and comparison of the Exhibit Q1 through Q3 items with the Exhibit S1 and S2 items revealed that the Exhibit Q1 and Q3 items were prepared with the Exhibit S2 photocopier and the Exhibit Q2 item was prepared with the Exhibit S1 copier. No evidence of significant indented writing was noted on the Exhibit Q1 through Q3 items.</p>
XNGL4W	<p>The documents in this case are photocopies. The photocopier characteristics, such as trash and roller marks, from the questioned documents were compared to those on the known exemplars to determine if they're from a common source. Trash marks, or defects, are visible on a document as a series of minute dots. Trash marks are normally caused by debris or marks on the glass platen of the photocopier. This pattern of marks then gets reproduced on any copies made on that machine at that time. Roller marks are caused by the rollers in the photocopier that transfer the documents through the inside of the photocopier. The rollers can cause horizontal or vertical indentation lines that may be visible via sidelighting or ESDA processing.</p>
XWTNMC	<p>1. The known photocopier that produced K2 was used in the production of Q1 and Q3. 2. The known photocopier that produced K1 was used in the production of Q2. 3. Exhibits Q1, Q2 and Q3 were examined for the presence of indented writing images. There were no indented writing images detected.</p>
XYXB33	<p>The paper of Q1, Q2, Q3, K1 and K2 is the same. The same physical mark on the paper caused by rollers and the pick-up mechanism of the machine is revealed on Q1, Q3 and K2. No mark is revealed on Q2 and K1. Toners used on Q1, Q3 and K2 are not differentiated between them as inks jet used on Q2 and K1. The same defects are observed on the one hand on Q1, Q3 and K2 and on the other hand on Q2 and K1. K1 was used in the production of Q2. K2 was used in the production of Q1 and Q3. K1 and K2 were used at least to produce the source documents.</p>
Y2JCKV	<p>Q1 and Q3: The Q1 and Q3 documents share class and individualizing characteristics with the K2 samples. Therefore it is my opinion that the Q1 and Q3 documents share a common source with the K2 known samples. This is a limited opinion. Because of the nature of photocopiers, it is possible to transfer visible defects printed on a document to subsequent generation copies using additional copiers or scanners and printers. The Q1 and Q3 documents do not share class and individualizing characteristics with the K1 samples. However, this should not be construed to be an exclusion opinion. Because of the nature of multifunction copiers, it is possible to produce documents in a manner that does not provide class or individualizing characteristics apparent on subsequent generation copies using additional copiers, scanners and/or printers. Q2: The Q2 document shares class and/or individualizing characteristics with the K1 samples. Therefore, it is my opinion that the Q2 document shares a common source with the K1 known samples. This is a limited opinion. Because of the nature of photocopiers, it is possible to transfer visible defects printed on a document to subsequent generation copies using additional copiers or scanners and printers. Q2 does not share class and/or individualizing characteristics with the K2 samples. However, this should not be construed to be an exclusion opinion. Because of the nature of multifunction copiers, it is possible to produce documents in a manner that does not provide class or individualizing characteristics apparent on subsequent generation copies using additional copiers, scanners and/or printers. Indentation Examination: The questioned documents were examined for the presence of any indented writing, typing, or other identifying impressions. These are impressions sometimes left on paper from writing, typing, or other markings done on another page while it was superimposed over the questioned material. There were similar paper transport mechanism</p>

TABLE 3

WebCode	Conclusions
	<p>impressions in common that were recovered in the front and back of Q1, Q3 and K2. This should not be construed as an identification of the known copier as other printers and copier document feeders may impart similar paper transport marks. Additionally, the known samples were not processed for impressions prior to the copying process to ensure the paper transport mechanism impressions were not present prior to the copying process. There were no meaningful impressions recovered in the Q2 or K1 samples. The resulting ESDA lifts (electrograph/imaging film) will be provided to the investigating agency. Printing Process Examination: Q1, Q3 and K2 were produced with an office machine system utilizing black toner. Toner, is utilized in some office machines such as laser printers, photocopiers, and facsimile devices. The printing process used to produce Q2 and K1 was a color ink jet process. Color inkjet printing is used in some office machines such as desktop printers, photocopiers and facsimile devices.</p>
Y9G8JU	<p>An examination was performed on Document Q1 (cut-out wording of "Mr. Miller watch es girls CHANGE in The locker room"), Document Q2 (cut-out wording of "d O ug mill er slept WITH two Students") and on Document Q3 (cut-out wording of "leave \$ 5,000 cash in oak Park trash OR i call Police"). An examination was also performed on Documents K1 which consists of 3 blank exemplars produced by a copier in the yearbook classroom (Kodak ESP Office 2170) and on Documents K2 which consists of 3 blank exemplars produced by a copier in the school library (Canon Image Runner 3225). While examining all of these documents on the Leica M60 and on the VSC 6000/HS numerous copier trash marks are visibly present. When aligning these trash marks on the VSC 6000/HS transmitted flood backlight feature my conclusion is as follows: Documents Q1 and Q3 were produced from the same source as Documents K2, the known Canon Image Runner 3225 photocopier. Document Q2 was produced from the same source as Documents K1, the known Kodak ESP Office 2170 photocopier.</p>
YATQJQ	<p>[No Conclusions Reported.]</p>
YB242R	<p>Q1 and Q3 were produced from the Library copier (Canon Image Runner 3225). Q2 was produced using the yearbook classroom copier (Kodak ESP Office 2170).</p>
YG7YKR	<p>The positioning/formation, size and shapes of stray color inkjet marks on K1 are similar to the corresponding stray color inkjet marks on Q2, confirming the K1 machine was involved in the creation of Q2. The positioning/formation, size and shapes of stray toner marks on K2 are similar to the corresponding stray color inkjet marks on Q1 and Q3, confirming the K2 machine was involved in the creation of Q1 and Q3. Given the direction of this testing scenario to accept the photocopiers as represented by the K1 and K2 exemplars, the K1 machine was not involved in the creation of Q1 and Q3 in its current condition (with the stray marks visible), and the K2 machine was not involved in the creation of Q2 in its current condition (with the stray marks visible).</p>
YHKXQH	<p>After examination and comparison using VSC, I have reached the following conclusions when superimposing the photocopiers (K1 and K2) with the questioned notes (Q1, Q2, and Q3): K1 photocopier was used in the production of questioned note, Q2. K2 photocopier (upper part) was used in the production of questioned note, Q1. K2, photocopier (lower part) was used in the production of questioned note, Q3.</p>
YWK6VR	<p>Based on my examination of the documents submitted the evidence observed is the basis for a reliable opinion that known copier K-2 was used to produce Q-1 and Q-2, and that known copier K-1 was used to produce Q-2. If you require further work or explanations please let me know.</p>
YYW6AU	<p>The Canon Image Runner 3225 photocopier (K2) was used in the production of Q1 and Q3. The Kodak ESP Office 2170 photocopier (K1) was used in the production of Q2.</p>
ZEL33U	<p>3.1.1.a) Sufficient individual characteristics are present to determine that item Q1 was produced, at some point in the machine copy process, on the K2 machine. 3.1.1.b) Sufficient dissimilar class characteristics exist between the Q1 item and the K1 machine copier to exclude the possibility of common source. 3.1.2.a) Sufficient individual characteristics are present to determine that item Q2 was produced, at some point in the machine copy process, on the K1 machine. 3.1.2.b) Sufficient dissimilar class characteristics exist between the Q2 item and the K2 machine copier to exclude the possibility of</p>

TABLE 3

WebCode	Conclusions
	<p>common source. 3.1.3.a) Sufficient individual characteristics are present to determine that item Q3 was produced, at some point in the machine copy process, on the K2 machine. 3.1.3.b) Sufficient dissimilar class characteristics exist between the Q3 item and the K1 machine copier to exclude the possibility of common source. 3.2) Items Q1, Q2 and Q3 were examined utilizing oblique lighting and the Electrostatic Detection Apparatus (ESDA) for the possible presence of indented impressions. 3.2.1) Indented impressions of transport/roller marks were detected on items Q1 and Q3; no other indented impressions of investigative value were detected on items Q1 and Q3. 3.2.2) No indented impressions of investigative value were detected on item Q2. Remarks: 1) The above findings are demonstrable through the use of enlarged illustrative charts. If testimony is anticipate, please return all submitted items and allow at least three weeks for the necessary preparation. 2) The developed indented impression lifts are being returned as item # 01.01 for your safekeeping.</p>
ZK9ZMB	<p>Based on the above-mentioned observations and analysis, I came to the following findings: 1. The documents marked "Q1" and "K2" were both produced by one and the same copier (Canon Image Runner 3225); 2. The documents marked "Q2" and "K1" were both produced by one and the same copier (Kodak ESP Office 2170); and 3. The documents marked "Q3" and "K2" were both produced by one and the same copier (Canon Image Runner 3225).</p>
ZL4HMQ	<p>During the examination Q2 and K1 were put together. It was identified on the transmitted light and Adobe Photoshop that the defects on the papers (black dots and small lines) are the same by the configuration and by the placement. So the document Q2 was printed on the same printer as the K1 (kodak esp office 2170) and the document Q1 and Q3 were printed on the same printer as document K2 (Canon Image Runner 3225).</p>
ZL6BHD	<p>SWGDOC and ASTM Standard Terminology for Expressing Conclusions of Forensic Document Examiners have been used in the preparation of the opinions in this report. The standard provides the following nine-level scale for expressing conclusions: identification; strong probability; probable; indications; no conclusion; indications did not; probably did not; strong probability did not; elimination. Based on the aforementioned examination results, an identification can be made as to the authorship of the Questioned printed samples. Questioned documents 1 and 3 were printed from the Library printer (K2). Questioned document 2 was printed from the Classroom printer (K1).</p>
ZPGTNF	<p>THAT THE COPIER IN THE YEARBOOK CLASSROOM (FOR EXEMPLAR "K1") PRODUCED NOTE MARKED "Q2" AND; THAT THE COPIER IN THE SCHOOL LIBRARY (FOR EXEMPLAR "K2") PRODUCED NOTES MARKED "Q1" AND "Q3"</p>
ZRPQR3	<p>Documents Q-1 and Q-3 were prepared on the same copier as known exemplars submitted as documents K2. Documents Q-1 and Q-3 were not prepared on the same copier as known exemplars submitted as documents K1. Document Q-2 was prepared on the same copier as known exemplars submitted as documents K1. Document Q-2 was not prepared on the same copier as known exemplars submitted as documents K2.</p>
ZTJE9C	<p>The photocopier represented by K1 can be identified as having been involved in the production of item Q2. This photocopier did not produce items Q1 and Q3. This photocopier cannot be eliminated as having produced an earlier generation of items Q1 and Q3. The photocopier represented by K2 can be identified as having been involved in the production of items Q1 and Q3. This photocopier did not produce item Q2. This photocopier cannot be eliminated as having produced an earlier generation of item Q2.</p>
ZV9P2Q	<p>Based upon my detailed examinations of the evidence, it is my opinion that: 1. Q1 and K2 share a common source. 2. Q1 and K1 do not share a common source. 3. Q2 and K1 share a common source. 4. Q2 and K2 do not share a common source. 5. Q3 and K2 share a common source. 6. Q3 and K1 do not share a common source.</p>
ZYLLQZ	<p>As a result of examination and comparison based solely on the material submitted the following conclusions and observations are opinions based upon my experience, education and training and are as follows: Q1: single sheet of white unlined paper measuring approximately 278mm x 215mm (10 15/16" x 8 7/16"), paper weight .003 -.004 No visible water marks Photocopy of another document 9</p>

TABLE 3

WebCode	Conclusions
ZZFA7B	<p>apparent cut outs of words and letter combinations possibly from magazine, newspaper or advertisements. Visible trash marks on paper. Variety of fonts present. Q2: single sheet of white unlined paper measuring approximately 278mm x 215mm (10 15/16" x 8 7/16"), paper weight .003 -.004 No visible water marks Photocopy of another document 9 apparent cut outs of words and letter combinations possibly from magazine, newspaper or advertisements. Visible trash marks on paper. Variety of fonts present. Q3: single sheet of white unlined paper measuring approximately 278mm x 215mm (10 15/16" x 8 7/16"), paper weight .003 -.004 No visible water marks Photocopy of another document 12 apparent cut outs of words and letter combinations possibly from magazine, newspaper or advertisements. Visible trash marks on paper. Variety of fonts present. 2. A VSC (Video Spectral Comparator) examination using various microscopic, infrared, ultraviolet, and alternate light source examination techniques revealed that the three sheets of paper, Q1 - Q3, reacted consistently to each other under all light sources. The K's were examined and reacted consistently to each other and to the Q documents. 3. An ESDA (ElectroStatic Detection Apparatus) examination for the detection and reading of indented writing, typing or other identifying impressions revealed no additional information. 4. Using the Identifont program was deemed unnecessary as there were not enough letters on any page to achieve identification. The documents utilized several point sizes in the cut outs. 5. No fingerprint processing or collection of DNA was performed on this evidence due to the CTS testing process. 6. Acetate overlays were created using the K1 and K2 exemplars. 7. It is my opinion that the K1 copier was used to create the Q2 document; the K2 copier was used to create the Q1 and Q3 documents.</p> <p>The K1 photocopier (Kodak ESP Office 2170) has been identified as the source of the Q2 note. An opinion of "identification" is a definitive conclusion with the highest degree of certainty and means that the features present in the comparable portions of the questioned and known documents provide very strong evidence supporting common source. The K2 photocopier (Canon Image Runner 3225) has been identified as the source of the Q1 and Q3 notes. An opinion of "identification" is a definitive conclusion with the highest degree of certainty and means that the features present in the comparable portions of the questioned and known documents provide very strong evidence supporting common source.</p>

Additional Comments

TABLE 4

WebCode	Additional Comments
2EVRGQ	Due to the different types of printing techniques, we can exclude Q1 and Q3 from being printed by K1 and can exclude Q2 from being printed by K2.
2YZEXN	All submitted exhibits along with the original indentation lifts are being returned with this report.
3DJCMP	Electrostatic Detection Apparatus, magnifying glass, Video Camera Microscope and Video Spectral comparator were used in my examinations.
43UVMM	To date, the documents submitted for our cases do not have so many trash marks, and the marks observed are usually faint.
4QL34N	Items Q1 to Q3 were all produced using the flat glass platen of the photocopier, as opposed to an automatic document feeder (ADF), since the trash marks were observed to be solitary, and spatially superimposed, instead of a streak spanning the page. The trash marks would have been located on the glass, as opposed to the lid, because of their presence on the face of the questioned items and not just the known standards. A manufacture's information search shows that the photocopier that produced K1, a Kodak ESP Office 2170, was a multifunction colour inkjet device. The photocopier that produced K2, a Canon Image Runner 3225, was a dry monocomponent toner, multifunction monochrome laser-based device.
64NTLL	If this was a real case, I would examine Q1 to Q3 for the possible presence of any indented impressions of writing. Also, I would suggest search for newspapers/magazines or similar which could be a source of the 'cut-outs' on the questioned notes.
8ZWL6G	Where trash marks differ between the questioned notes and known samples it is not possible to exclude the printer as a multi-generation copy could have been made on the other side of an A3 platen (without trash marks) or via the feed mechanism and thus not utilising the platen
9A26M4	The same batch of blank paper which was used to prepare the known exemplars is recommended to be submitted for examination to determine if any of the trash marks found in the known exemplars was originated from the blank paper.
A3W2K7	Because this case may appear simple, i.e. anonymous note Q2 was produced on copier K1, and notes Q1 and Q3 were produced on copier K2, since the copier trash marks match, I'd like to explain my thought process and reason for the answers I gave. I'd first like to address the issue of trash marks, which I believe can appear for several reasons. 1. Scratches, dust, stray toner are found on the copier drum. When this happens, trash marks appear but they don't always appear in the same location on every sheet of paper feed through the copier. Due to the rotation of the drum, a trash mark can appear at the top of the page on one sheet of paper, yet appear further down the page on a subsequent piece of paper. The trash mark can disappear altogether if they are on the back side of the drum when a paper passes through. That did not happen in this case, as the positioning is identical on all pages from the same copier, as proven when they are stacked and viewed on a light table, so we know the trash marks are not caused by issues "internal" to the copier. 2. Scratches, fingerprints, dust, etc. are found directly on the glass platten. The completed document is laid on the platten, and the impurities on the glass are copied along with the image. 3. No image is placed on the platten. Impurities found on the glass platten are copied onto blank pieces of paper passing through the copier. 4. No image is placed on the platten. The platten is clean and free of debris, but there are impurities on the white "blanket" found on the underside of the copier lid. When the lid is closed and copies are made, impurities from the lid are copied onto blank paper passing through the copier. 5. Blank paper that already contains trash marks (as described in scenarios 3 & 4) is used for a foundation to create a "new" document. Why mention scenario #5? The documents provided have an excessive number of trash marks, some quite large and obvious. Yet no one at the school is taking the initiative to clean the glass? For weeks at a time? The same flaws exist in the exact same locations on documents sent on 12.4 and 12.15. Were these anonymous notes really created and "copied" on that day, or did the perpetrator have several blank sheets obtained and one time, make his notes at one time, and then space out their delivery? Additionally, in the copies provided to me, the trash marks from Q1 (12.4.17) are lighter than the trash

TABLE 4

WebCode	Additional Comments
	marks from Q3 (12.15.17). Would the marks really get darker over time? In my experience trash marks get lighter with subsequent copies, particularly those made on different days. As more documents are copied, i.e. more documents are laid on the platten, they eventually lift or remove some of the trash marks. Could it be that the perpetrator took blank paper from the trash can by the copier so as to make it appear the notes were created on that copier? Or simply made several blank copies with the lid down? Then assembled his hate notes, and deliberately posted them on the teacher's door on a day he knew he was not going to use that particular copier? (in order to deflect suspicion from himself) And frankly, if someone is going to go to all the trouble to cut out words and letters, can they risk doing this at work? Might they take blank sheets from the trash, (or simply run a few blank sheets) assemble the notes at home, then copy them at kinkos? I think it's too "pat" to simply say "let's see who used copier K2 on 12.15.17. Also note the word "CHANGE" on Q1 and the words "OR" and "Police" on Q3 contain excessive laser toner spray, indicating they were not cut from a pre-printed lithographic source like a magazine, but instead were probably created and printed by the perp on some laser source, then added to the cut-and-paste note. So once you have narrowed your suspects, would you also want to check the hard drives of the school computers to see if you could find these words? A more daunting task than cross referencing who used a copier, but just a thought. Were those words typed on a library computer, etc.? I would err on the side of caution with regard to assuming a note was copied on the same day it was delivered.
AXKJE3	The reference "K" material is not fully adequate to perform all the necessary examinations.
B2WKHT	3. All the marks on document mark "K1" and "Q2" are not in solid black, but have some colour marks in between it. 4. All the marks on document mark "K2"; "Q1" and "Q3" are solid black marks. 5.
BMWDDG	The laboratory equipment VSC6000HS, Leyca stereomicroscope and INSPEC II were used for the present analysis.
C7Q3QX	Individualizing and class characteristics (including significant trash marks and repeating, reproduced indentations, which are of similar size, shape, and location) were observed in comparison of the Q1 note with each of the school library copier exemplars. Individualizing and class characteristics (including significant trash marks, which are of similar size, shape, and location; and similar various colored and black, flat ink droplets of uniform size) were observed in comparison of the Q2 note (rotated 180-degrees) with each of the yearbook classroom copier exemplars. Individualizing and class characteristics (including significant trash marks and repeating, reproduced indentations, which are of similar size, shape, and location) were observed in comparison of the Q3 note (rotated 180-degrees) with each of the school library copier exemplars.
D773P6	An examination of Q1, Q2, Q3, K1 and K2 utilizing the Electrostatic Detection Apparatus (ESDA) revealed the presence of impressions. In accordance with laboratory policy, images depicting positive results are treated as derived evidence. The laboratory will maintain and store this derived evidence in accordance with this established policy.
DFBVEY	The scale of conclusions is constructed exclusively for evidence evaluation at [Laboratory]. Level +4: The results of the examination extremely strongly support that ... The results are extremely more probable if the main hypothesis is true compared to if the alternative hypothesis is true. Level +3: The results of the examination strongly support that ... The results are much more probable if the main hypothesis is true compared to if the alternative hypothesis is true. Level +2: The results of the examination support that ... The results are more probable if the main hypothesis is true compared to if the alternative hypothesis is true. Level +1: The results of the examination support to some extent that ... The results are somewhat more probable if the main hypothesis is true compared to if the alternative hypothesis is true. Level 0: The results of the examination support neither ... nor ... The results are equally probable if the main hypothesis is true compared to if the alternative hypothesis is true. Level -1: The results of the examination support to some extent that ... was not ... The results are somewhat more probable if the alternative hypothesis is true compared to if the main hypothesis is true. Level -2: The results of the examination support that ... was not ... The results are more probable if the alternative hypothesis is true compared to if the main hypothesis is true. Level -3: The results of the examination strongly support that ... was not ... The results are much more probable if the alternative hypothesis is true compared to if the

TABLE 4

WebCode	Additional Comments
	main hypothesis is true. Level -4: The results of the examination extremely strongly support that ... was not ... The results are extremely more probable if the alternative hypothesis is true compared to if the main hypothesis is true. If one of the hypotheses can be excluded other terms are used, such as "it is", "it is not" or "it can be excluded that".
DPYNQW	Items Q1, Q2 and Q3 were examined for the presence of indented writing impressions. No indentations of evidentiary value were observed.
EM8JH4	No indented writing of value was observed on Items 1 (Q1), 2 (Q2), or 3 (Q3) utilizing side lighting and an electrostatic detection device.
EWGC3D	1) Samples of a comparable nature are always ideal when conducting an examination. It is ambiguous as to the exact method used to generate the "blank exemplars on each machine for comparison purposes" (i.e. were the pages generated by simply closing the cover and pressing the copy button 3 times, or was a blank page placed on the platen and the cover closed and then the copy button pressed?) 2) The above propositions were considered given the current evidence. Should more specimens of a comparable nature become available, another examination could be completed. Should different propositions be considered, the conclusions provided could be subject to change.
HCCA94	UTILIZING A LOGAN LIGHT BOX, VISUAL UNAIDED INSPECTION AND ENLARGING EQUIPMENT, THE COPIER TRASH MARKS REVEALED THE SOURCES OF THE PHOTO COPIES IN QUESTION.
JN2L3T	Further forensic document examinations: Examinations could be undertaken and photographs could be captured of the glass platen on the photocopiers to identify the cause of (at least some of) the trash marks if they are still present. Known samples could be collected from the known photocopiers bearing printing similar to that of the Q as well as completely black pages to allow further consideration to be given to other print defects that are evident on Q1, Q2 and Q3. Other documents produced using the known photocopiers at known times could be submitted and a "timeline" could be created in order to possibly determine when the Q docs were produced in relation to these known documents. The above three further examinations may allow for additional useful comments and/or conclusions to be expressed regarding the machine reproduction histories of the questioned documents. Other forensic examinations: Consideration should be given to submitting any digital storage device associated with each of the office machine ("photocopiers") to a computer forensic examiner and/or to the appropriate office machine technical person to determine whether or not there are any digitally stored images of the questioned documents on such devices. Such images could be interrogated by a suitably qualified expert to indicate the logon details used by the person who created each questioned document as well as the date and time of production of each document. The questioned documents could be treated for the possible presence of fingerprints.
JQQVDF	Exhibits Q1, Q2, Q3, K1 and K2 will be returned to the submitting agency.
KUB3D3	There is a lag of approximately 1 mm between the particles or marks present in K2 and the marks present in the questioned note Q1. There is a small line in the oblique direction, in the questioned note Q1, located in the upper area of the word "Miller", specifically in the vowel "i" and several points of toner that are not present in K2. The points correspond to the white background of the cutout of the word "Miller", but the oblique line appears as a new element that does not match the design of the mark or imprint in K2. Said line could probably have been present on the sheet where the cuttings were stuck, before the photocopy, since it can also correspond to a particle present on the surface of the photocopier.
L7GF6M	It is possible that more definitive opinions may be reached regarding the comparison of the document labeled Q2 to the photocopier identified as K2 as well as the documents labeled Q1 and Q3 to the photocopier identified as K1. Since both photocopiers are multi-functional devices, additional known standards from these photocopiers are needed. At least 6 – 8 samples should be collected from each printing path and discretely numbered in the order of production. Contact the Forensic Document Unit for assistance prior to collecting known standards from these copiers. Furthermore, additional examinations are possible if documents are located that may be related to the original documents used to produce the documents labeled Q1, Q2, or Q3. The EDD lifts and images of the submitted items are

TABLE 4

WebCode	Additional Comments
	being retained by the Forensic Document Unit.
LJ3PUD	The submission of the suspected copy machines may provide the basis for additional conclusions. Exhibits Q1, Q2, Q3, K1 (1-3), K2 (1-3) and the original ESDA indentation lifts will be returned to the submitting agency.
LP7ZHX	The irregular short lines seen by oblique light in K2, Q1, and Q3 were probably caused by an accumulation of toner on a roller in the copier. Although oblique light showed them to be of similar appearance and closely similar positions that comparison was sufficiently accurate to be supporting evidence only. The matching defect marks were sufficient on their own to show that the copier produced those copies.
NQGDJZ	Conclusion 1: Based on what is indicated in result 1, it is concluded that the photocopier used to prepare the comparison document identified as "K2" was the same photocopier used to prepare the questioned documents identified as "Q1" and "Q3". Conclusion 2: Based on what is indicated in result 2, it is concluded that the photocopier used to prepare the comparison document identified as "K1" was the same photocopier used to prepare the document questioned as "Q2".
P2AFXD	Q1 & Q3: The K1 copier was probably not used (or is unlikely to have been used) in the production of these documents due to the lack of trashmarks and different printing processes. If it was used in an earlier version of the Q1 and/or Q3 documents, no K1 trashmarks have transferred and it would have had to be used prior to being produced on the K2 copier (due to the print type). Q2: The K2 copier was probably not used (or is unlikely to have been used) in the production of this document due to the lack of trashmarks and different printing processes. If it was used in an earlier version of the Q2 document, no K2 trashmarks have transferred and it would have had to be used prior to being produced on the K1 copier (due to the print type).
PV6GMN	Note Q3 is upside down in relation to Q1 in orientation of printed text. Obtaining further specimen with content from the printer K1 to confirm printer defect observed in Q2 could provide further evidence, however current evidence is sufficient to conclude the paper of Q2 has come from using the machine of K1 in its production.
T7AVZX	Some limitation was present as there were no exemplars available from the time period(s) before the receipt of document Q3. The submission did not specify if the known and questioned documents were protected from being copied / scanned by a device that uses an automatic document feeder. Accordingly, although similar indented markings were observed between K2, Q1 and Q3 some caution must be taken in the interpretation of the indentation source.
TPNBGR	REMARKS: 1. Evidence listed on Invoice #Q1121169 will be forwarded to the Evidence Control Section for safekeeping. 2. If court testimony is required, please notify this examiner at least two weeks prior to such so that court demonstrative charts can be prepared.
UTNLB8	No evidence was located to suggest that the letters Q1 and Q3 had been scanned on the Kodak ESP Office 2170 copier (K1), or that the letter Q2 had been scanned on the Canon ImageRunner 3225 copier (K2). However, as both machines are multi-function devices, the potential that either of them has been used as a printer in some earlier stage of the production of the questioned documents cannot be excluded.
VX8DRY	The investigator provided an inadequate explanation for how the known exemplars were created as far as the "darkness" or "intensity" settings. This examiner would have requested a better explanation before reporting the results. The reasoning is because a person could use a copier system on a "light" intensity setting or else one that has no appreciable trash marks to photocopy a document that already bore trash markings created from a previous copier system.
WPDK6Q	It is possible to appreciate imperfect impressions in some parts of the leaves, which can be the object of elements or dirt that are positioned on the surface of the glass and even by internal defects of the roller, which are placed in an indistinct way when printed, leaving permanent or transient impressions that depend on the maintenance performed. In the photocopies can detect irregularities of the source that produced it, which are appreciated even in this case are observed in the sheets K1 and K2, to establish the provenance.

TABLE 4

WebCode	Additional Comments
XNGL4W	The K1 photocopier was used in the production of Q2. While these documents share a common source, it should be noted that another copy machine or printer may have also been used in the production of the Q2 document. The K2 photocopier was used in the production of Q1 and Q3. While these documents share a common source, it should be noted that another copy machine or printer may have also been used in the production of the Q1 and Q3 documents.
XYXB33	According to the results of the chemical analyses, the toner used by the copier in the school library (Canon Image Runner 3225) is not the original but compatible toner. Could you confirm that ? It's for a subject of research and development.
Y2JCKV	The Q1 and Q3 documents cannot be identified with, nor excluded from being produced by the K1 printer at some point. Because of the nature of multifunction copiers, it is possible to produce documents in a manner that does not provide class or individualizing characteristics apparent on subsequent generation copies using additional copiers, scanners and/or printers. Q2 cannot be identified with, nor excluded from being produced by the K2 printer at some point. Because of the nature of multifunction copiers, it is possible to produce documents in a manner that does not provide class or individualizing characteristics apparent on subsequent generation copies using additional copiers, scanners and/or printers.
YG7YKR	Further inquiry in a non-test scenario would help determine if the stray marks on the K1 and K2 machines were produced by unclean copier glass platens. As stray marks from unclean copier glass platens tend to be temporary/transient in nature, no determination would technically be currently possible as to whether or not a clean K1 made earlier clean copies of Q1 and Q3, or whether or not a clean K2 made an earlier clean copy of Q2.
YWK6VR	The documents submitted are being retained in my files until further notice.
ZTJE9C	Where photocopiers have both platen and automatic document feeder (ADF) copying capabilities it is possible for a copy to be made using the ADF that would not exhibit the platen trashmarks associated with the photocopier. The copy generation of items Q1 to Q3 cannot be determined; therefore the possibility that items Q1 to Q3 are second or subsequent copies produced by another photocopier cannot be eliminated.
ZV9P2Q	Gloves were worn during these examinations. Additional forensic examinations, such as DNA and Latent Prints, may result in additional findings.

-End of Report-
(Appendix may follow)

Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program

Test No. 18-521: Questioned Documents Examination

DATA MUST BE RECEIVED BY April 30, 2018 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

Accreditation Release Statement

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and A2LA. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section on the last page must be completed and submitted.)
- This participant's data is NOT intended for submission to ASCLD/LAB, ANAB, or A2LA.

Scenario:

A teacher at a local high school is the target of accusations and threats via anonymous notes left on his classroom door. Over the course of approximately two weeks, three different photocopied notes were affixed to this location. Investigators have identified two school copiers that may have been the source of these items. Since a user is required to scan his or her school ID to use each machine, they may be able to narrow their list of suspects if the notes were produced on a specific copier. Blank exemplars were produced on each machine for comparison purposes after the extortion note was received. Please examine the notes and blank exemplar copies to determine if any of the photocopiers can be identified as a source of the notes.

Please follow your laboratory's standard protocol for examining questioned document evidence.

Items Submitted (Sample Pack QD):

- K1: Three blank exemplars produced by the copier in the yearbook classroom (Kodak ESP Office 2170).
- K2: Three blank exemplars produced by the copier in the school library (Canon Image Runner 3225).
- Q1: Note left on December 4, 2017, reading "Mr. Miller watches girls change in the locker room"
- Q2: Note left on December 12, 2017, reading "Doug Miller slept with two students"
- Q3: Note left on December 15, 2017, reading "Leave \$5000 cash in Oak Park trash or I call police"

Please note: A label with the corresponding item number has been affixed to the back of each item and is not to be considered for analysis.

1.) Based on the findings of your examination, could any of the photocopiers, as represented by the known exemplars, be used in the production of the questioned notes (Q1, Q2, Q3)?

(Select from the following list of conclusions and insert the appropriate letter in the spaces provided. If the wording below differs from the normal wording of your conclusions, adapt these conclusions as best you can and use your preferred wording for question 3.)

- A. The known photocopier WAS USED in the production of the questioned note.
- B. The known photocopier WAS PROBABLY USED in the production of the questioned note.
- C. CANNOT DETERMINE whether or not the known photocopier was used in the production of the questioned note.
- D. The known photocopier WAS PROBABLY NOT USED in the production of the questioned note.
- E. The known photocopier WAS NOT USED in the production of the questioned note.

**Should the response "C" be used, please document the reason in the Additional Comments section of this data sheet.*

	K1 (Classroom)	K2 (Library)
Q1		
Q2		
Q3		

Please return all pages of this data sheet.

Participant Code:

WebCode:

2.) Methods and techniques utilized.

(e.g., microscopic/macrosopic, comparison techniques, instrumental analysis (type), Indented writing (electrostatic, oblique, other), ink examination (chemical, visual, ultraviolet, infrared), etc.)

Please briefly indicate the observations made from each method/technique utilized.

Please note: The list of methods/techniques provided to the left is not an all inclusive list and should not be used to determine what methods/techniques should be performed. Methods/techniques not on this list may be utilized.

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If additional space is needed, copy this page or attach your own form following this layout.

Participant Code:

WebCode:

3.) What would be the wording of the Conclusions in your report?

4.) Additional Comments

<p>Return Instructions: Data must be received via online data entry, fax (please include a cover sheet), or mail by <i>April 30, 2018</i> to be included in the report. Emailed data sheets are not accepted.</p>	<p>Participant Code: ONLINE DATA ENTRY: www.cts-portal.com</p>
<p>QUESTIONS? TEL: +1-571-434-1925 (8 am - 4:30 pm EST) EMAIL: forensics@cts-interlab.com www.ctsforensics.com</p>	<p>FAX: +1-571-434-1937 MAIL: Collaborative Testing Services, Inc. P.O. Box 650820 Sterling, VA 20165-0820 USA</p>

Please return all pages of this data sheet.

Collaborative Testing Services - Forensic Testing Program

RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

WebCode:

for Test No. **18-521: Questioned Documents Examination**

This release page must be completed and received by **April 30, 2018** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

Have the laboratory's designated individual complete the following steps **only if your laboratory is accredited in this testing/calibration discipline** by one or more of the following Accreditation Bodies.

Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory

ANAB Certificate No. _____

(Include ASCLD/LAB Certificate here)

A2LA Certificate No. _____

Step 2: Complete the Laboratory Identifying Information in its entirety

Signature and Title _____

Laboratory Name _____

Location (City/State) _____

Return Instructions**Accreditation Release**

Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.

*Questions? Contact us 8 am-4:30 pm EST
Telephone: +1-571-434-1925
email: forensics@cts-interlab.com*

Please return all pages of this data sheet.

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