Appendix 1 – **All About Me (Genetics) Experiment**

Here is a brief explanation of the data that is captured as part of the Flash *All About Me Experiment* from *ExperimentsAtSchool.*

The table below shows a sample of data from the experiment, in this case it shows three separate records (the results from three sessions). The columns LEACode, SchoolCode, Project_ID, ID (unique record id), and Submitted (the submit date) have all been removed to help explain the resultant data more clearly.

Participant gender (m/f)

Participant age (6-96)

gender	hand	dominant_eye	dimples	cleft_chin	freckles	thumb	tongue	eye-distance	ear_lobe	top_thumb	age	mouth
f	e	l	n	n	y	?	n	70	f	r	15	50
f	l	r	y	n	y	s	r	65	a	l	19	65
m	r	l	y	y	n	?	n	55	?	l	44	60

The experiment asks a participant to answer some questions on their physical characteristics. The data returned is added to a single record. From left to right the columns include:

- 'hand' - the dominant or writing hand, 'l' = left handed, 'r' = right handed 'e' = ambidextrous/either.
- 'dominant_eye' - responses include 'l' = left eye, 'r' = right eye '?' = not sure.
- 'dimples' - do they have dimples, 'y' = yes, 'n' = no, '?' = not sure.
- 'cheft_chin' - a line in the middle of the chin, 'y' = yes, 'n' = no.
- 'top_thumb' - when asked to lock their hands together which thumb is on top, 'l' = left thumb on top, 'r' = right thumb on top.
- 'tongue' - can they roll their tongue, 'y' = yes, 'n' = no.
- 'freckles' - do they have freckles, 'y' = yes, 'n' = no.
- 'thumb' - a straight or curved thumb, 's' = straight, 'c' = curved, '?' = not sure.
- 'ear_lobe' - is their ear lobe attached or free/unattached, 'a' = attached, 'f' = free,'?' = not sure.
- 'eye-distance' - distance from the centre of one pupil to the centre of another in millimetres (30mm – 150mm).
- 'mouth' – distance from one corner of the mouth to the other without smiling (30mm – 120mm).

Appendix 2 – Angle Estimation

Here is a brief explanation of the data that is captured as part of the Flash *Angle Estimation Experiments* from *ExperimentsAtSchool.*

The table below shows a sample of data from the experiment, in this case it shows two sessions the first in the darker green contains 5 records and is a user defined experiment while the second, in a lighter green, contains 15 records and is the standard experiment.

Unique record 'id' number

The 'attempt' number (1-15)

LEA and School Code

Additional Project Code

Estimate of Angle (˚)

Actual Angle (˚)

Angle Starting Position

Pie type (Flat/Mid/3D)

Unique id	Attempt	LEA	School	Proj	Add Proj	Gender	Estimate	Actual	Start Pos	Pie type	User	Date/Time
117313	1	100	9999	44	eas_000	m	5	25	SW	Flat	1	12/11/2013 09:37
117314	2	100	9999	44	eas_000	m	15	45	SW	Flat	1	12/11/2013 09:37
117315	3	100	9999	44	eas_000	m	90	75	SW	Flat	1	12/11/2013 09:37
117316	4	100	9999	44	eas_000	m	5	5	SW	Flat	1	12/11/2013 09:37
117317	5	100	9999	44	eas_000	m	80	75	SW	Flat	1	12/11/2013 09:37
117318	1	100	9999	45	eas_000	m	80	80	W	Flat	0	13/11/2013 09:36
117319	2	100	9999	45	eas_000	m	170	160	SE	Flat	0	13/11/2013 09:36
117320	3	100	9999	45	eas_000	m	160	155	SE	3D	0	13/11/2013 09:36
117321	4	100	9999	45	eas_000	m	280	300	S	Flat	0	13/11/2013 09:36
117322	5	100	9999	45	eas_000	m	290	305	S	Mid	0	13/11/2013 09:36
117323	6	100	9999	45	eas_000	m	190	200	NE	Mid	0	13/11/2013 09:36
117324	7	100	9999	45	eas_000	m	185	190	NE	Flat	0	13/11/2013 09:36
117325	8	100	9999	45	eas_000	m	90	90	N	Flat	0	13/11/2013 09:36
117326	9	100	9999	45	eas_000	m	85	85	N	3D	0	13/11/2013 09:36
117327	10	100	9999	45	eas_000	m	185	190	NE	3D	0	13/11/2013 09:36
117328	11	100	9999	45	eas_000	m	175	165	SE	Mid	0	13/11/2013 09:36
117329	12	100	9999	45	eas_000	m	70	65	W	Mid	0	13/11/2013 09:36
117330	13	100	9999	45	eas_000	m	320	305	S	3D	0	13/11/2013 09:36
117331	14	100	9999	45	eas_000	m	70	65	W	3D	0	13/11/2013 09:36
117332	15	100	9999	45	eas_000	m	95	95	N	Mid	0	13/11/2013 09:36

Participant age (6-96)

Participant gender (m/f)

'User' defined or not (1 or 0)

Date/Time of Entry

The standard experiment will always provide 15 angles to estimate, the actual angle the starting position and type (Flat/Mid/3D) are all selected randomly. In addition the angles will always be to the nearest 5˚.
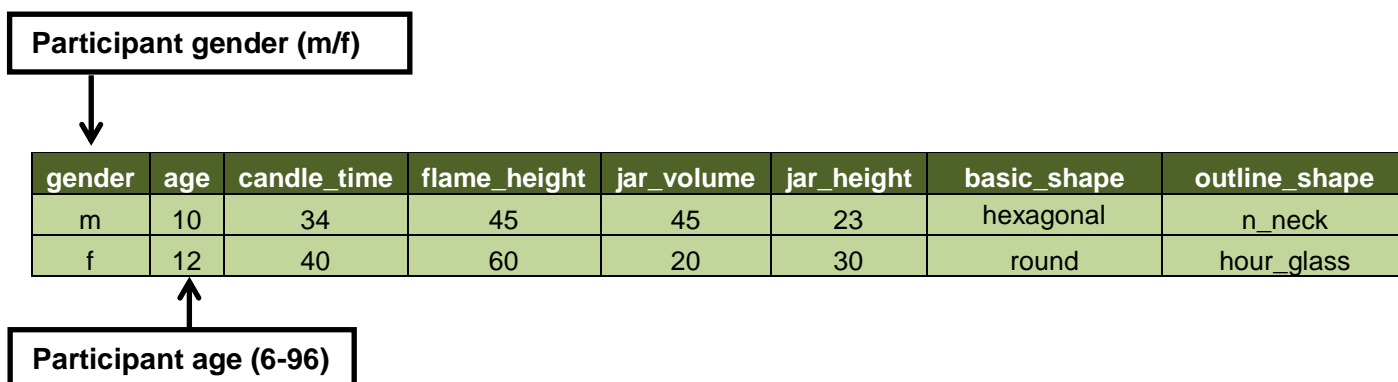
In the user defined experiment (indicated by a '1' in the column 'User') a participant gets to select how many angles they wish to attempt (5-15), the range of angles (0˚-90˚, 0˚-180˚, 0˚-360˚), how they will round the answers (1˚,5˚,10˚,15˚), the chart type (Flat/Mid/3D or a random 'Mix' of all three) and then finally the compass starting point or origin of the angle (N,NE,E,SE,S,SW,W,NW or a random 'Mix' of all of these).

Appendix 3 – Candle Combustion

Here is a brief explanation of the data that is captured as part of the Flash *Candle Combustion Experiment* from *ExperimentsAtSchool.*

The table below shows a sample of data from the experiment, in this case it shows two sessions and the resultant records.

Note that unlike the others this experiment is based on a physical experiment and can be used to record observations made from that experiment. For more information on how to carry out the experiment please view the orginal experiment home page at experimentsatschool.org.uk

Participant gender (m/f)

gender	age	candle_time	flame_height	jar_volume	jar_height	basic_shape	outline_shape
m	10	34	45	45	23	hexagonal	n_neck
f	12	40	60	20	30	round	hour_glass

Participant age (6-96)

The participant enters the following information for this experiment:

1. *candle_time* - time in seconds (s) that the candle burned for.
2. *flame_height* - flame height in millimetres (mm), this value is optional.
3. *jar_volume* - the volume of the jar used.
4. *basic_shape* - is basic shape of the jar used; *hexagonal*, *round* or *square.*
5. *outline_shape* – what is the outline shape; *bottle*, *n_neck*, *n_base*, *hour_glass*, *vase.*

Appendix 4 – Colour Maker Experiment

Here is a brief explanation of the data that is captured as part of the Flash *Colour Maker Experiments* from *ExperimentsAtSchool.*

The table below shows a sample of data from the experiment, in this case it shows three separate records (the results from three sessions). The columns LEACode, SchoolCode, Project_ID, ID (unique record id), and Submitted (the submit date) have all been removed to help explain the resultant data more clearly.

Participant age (6-96)

Participant gender (m/f)

Ishihara test result

age	gender	quicktest	r1	g1	b1	r2	g2	b2	r3	g3	b3	r4	g4	b4	r5	g5	b5	r6	g6	b6
22	m	red-green	238	237	14	232	15	12	256	149	128	128	20	13	2	184	2	23	11	110
56	f	undefined	0	255	0	0	255	128	0	128	128	0	0	255	0	0	255	255	128	255
44	m	normal	179	163	0	127	0	0	129	45	0	33	3	0	0	64	0	0	0	64

Banana	Cherries	Peach	Coconut Shell	Garden Pea	Blueberries

The participant first completes 3 Ishihara colour perception plates. Due to monitor colour variations these results may not be accurate, however:

- If a number can clearly be seen the result will be 'normal'.
- If the numbers looks like a different (incorrect) number it may indicate a red-green colour vision defect, the result will be 'red-green'.
- If no number can be seen by a participant it may indicate total colour blindness, the result will be 'undefined'.

The participant is then asked to use *Red, Green* and *Blue* colour sliders to reproduce the colour for six items, these are Banana, Cherries, Peach, Coconut Shell, Garden Peas and Blueberries. Each *Red*, *Green* and *Blue* monitor colour value ranges from zero (no colour) to 255 (full colour) so the resultant RGB values make up a unique colour e.g. R179, G163, B0, used for Banana in the last record, is a dark greenish yellow. The RGB for each item is added to the record.

Appendix 5 – Number Estimation Experiment

Here is a brief explanation of the data that is captured as part of the Flash *Number Estimation Experiment* from *ExperimentsAtSchool.*

The table below shows a sample of data from the experiment, in this case it shows one compete record (one attempt). The columns LEACode, SchoolCode, Project_ID, ID (unique record id), and Submitted (the submit date) have all been removed to help explain the resultant data more clearly.

Participant age (6-96)	Participant gender (m/f)		Participant estimate (1-12)	Actual answer (1-12)	

age	gender	attempt	estimate	answer	dot_type
44	m	1	4	4	u
44	m	2	10	11	u
44	m	3	12	10	p
44	m	4	11	12	u
44	m	5	9	7	u
44	m	6	12	12	p
44	m	7	4	4	u
44	m	8	9	9	p
44	m	9	10	8	u
44	m	10	4	4	u
44	m	11	9	9	u
44	m	12	12	11	p
44	m	13	11	8	u
44	m	14	7	7	p
44	m	15	8	10	p
44	m	16	8	11	p
44	m	17	3	3	u
44	m	18	10	10	p
44	m	19	12	11	p
44	m	20	12	12	p

Attempt number (1-20)   Dot type used (u or p)

A participant views 20 cards, each card has a number of dots (1-12 selected at random) arranged either in a pattern (p) or randomly/unordered (u). The arrangement type, 'p' and 'u', are also selected randomly but a participant will always get 10 cards with a pattern and 10 without.

The *estimate* is what a participant thought they saw/counted while the *answer* is the actual number of dots on the card presented to them on that attempt.

Appendix 6 – Optical Illusion Experiment

Here is a brief explanation of the data that is captured as part of the Flash *Optical Illusion Experiment* from *ExperimentsAtSchool*.

The table below shows a sample of data from the experiment, in this case it shows three separate records (the results from three sessions). The columns LEACode, SchoolCode, Project_ID, ID (unique record id), and Submitted (the submit date) have all been removed to help explain the resultant data more clearly.

Participant age (6-96)

Participant gender (m/f)

Time taken to complete all illusions (in seconds)

age	gender	value1	value2	value3	value4	value5	value6	value7	value8	value9	time_taken
44	M	-34.15	21.8	-68.2	131.85	-156.05	59.55	38.75	-37.35	18.45	58.849
44	M	250.25	170.25	131.25	230.25	80.25	300.25	105.25	155.25	334.25	32.524
40	F	-149.75	-229.75	-268.75	-169.75	-319.75	-99.75	-294.75	-244.75	-65.75	39.285

Score/Value for each illusion

A participant drags a slider to try and accurately represent an illusion, the resultant 'value' for each illusion is the score. A positive value indicate the participant was too far one way, a negative value indicates the participant was too far the other, a score of zero would mean they have perfectly matched the illusion.

In the example above the first record is an honest attempt to try and complete the experiment while the second is a participant sliding the slider all the way to the right and the third is a participant sliding the slider all the way to the left (hence record 2 having all positive values and record 3 having all negative values).

The scoring mechanism for each illusion is calculated slightly differently but in the main it is the number of pixels that an answer is out by, for example, a rectangle has a width of 100px (the zero score), if the answer given is 90px the number used is -90, if the answer given is 110px the number used is 110.

$$\frac{(-90 - 100/100) \times 1000}{10} = -10 \qquad \frac{(110 - 100/100) \times 1000}{10} = 10$$

For the Koffka colour illusion the RGB for the grey colour is *Red 151, Green 151, Blue 151* (approx.) a total of 453 (the zero score) so the calculation is:

$$\frac{(RGB - 453/453) \times 1000}{10} = Score$$

Appendix 7 –Reaction Timer Experiment

Here is a brief explanation of the data that is captured as part of the Flash *Reaction Timer Experiment* from *ExperimentsAtSchool.*

The table below shows a sample of data from the experiment, in this case it shows four separate records (the results from four sessions). The columns LEACode, SchoolCode, Project_ID, ID (unique record id), and Submitted (the submit date) have all been removed to help explain the resultant data more clearly.

Participant age (6-96)

Participant gender (m/f)

age	gender	hand	l1	l2	l3	r1	r2	r3
12	m	r	0.27	0.28	0.21	0.27	0.28	0.21
12	f	r	0.33	0.54	0.31	0.37	0.32	0.31
12	m	r	0.21	0.24	0.23	0.28	0.26	0.25
12	m	r	0.37	0.26	0.31	0.3	0.25	0.32

Dominant hand (l/r/e)

Left handed attempts (s)

Right handed attempts (s)

After establishing the most dominant hand ('l' - left, 'r' - right or 'e' - either) a participant attempts to click a light on the screen (a green traffic light) as soon as it comes on.

The time taken from the moment the light goes on to when the user clicks is recorded. This is done 6 times, 3 times with the left hand and 3 times with the right hand.

Appendix 8 – Time Estimation Experiment

Here is a brief explanation of the data that is captured as part of the Flash *Time Estimation Experiment* from *ExperimentsAtSchool.*

The table below shows a sample of data from the experiment, in this case it shows two separate records (the results from two sessions). The columns LEACode, SchoolCode, Project_ID, ID (unique record id), and Submitted (the submit date) have all been removed to help explain the resultant data more clearly.

Participant age (6-96)

Participant gender (m/f)

age	gender	hand	g1	g2	g3	g4	g5	s1	s2	s3	s4	s5
15	m	r	4.6	2.8	0.8	3.7	6.9	5.32	2.48	0.76	4.09	6.92
12	m	r	2.6	4.5	0.7	7.5	4.6	2.04	4.2	0.47	6.19	6.75

**Hand used
(Left/Right/Ambidextrous)**

Guess (g1-g5)

Actual (s1-s5)

A participant first selects what hand they are using to complete the experiment this is indicated by 'l' (left), 'r' (right) and 'e' (either/ambidextrous).

The participant then uses a sliding scale from 0 to 8 (0.1seconds to 8 seconds) to estimate how long the 'light bulb' is lit for, this is done 5 times. The light bulb is lit for a random amount of time for all 5 times.

The guesstimate for each of the 5 times is recorded (g1-g5) along with the actual amount of time the light bulb was lit for (s1-s5).

In the second example above the 12 year old participant did well at estimating the first three (g1-g3) getting close to the actual times (s1-s3), however, the last two were overestimated and underestimated, respectively, by over a second.