

## **Independent Investigation - How does the distance between light and an object affect the shadow?**

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### **Variables**

Dependent – The length of the shadow is measured

Independent – The distance from the object (highlighter) from the light source (phone)

Controlled – The same object is used, the same light source is used, the darkness of the room is the same, the strength of the light is the same and the angle of which the light is coming from is a controlled variable

### **Equipment**

- 1 light source (highlighter)
- 1 to measure the shadow (phone)
- 1 ruler to measure the length of the shadow and the distance between the light source and the object

### **Method**

1. Lay the highlighter or whatever object flat on a surface when the room is dark, block out sunlight.
2. Set your light source at a certain distance (cm) from the object and measure the distance with a ruler. Record this in your table.
3. Switch on the light directly above the highlighter, then with a ruler, measure the length of the shadow. Record this in your table.
4. Repeat this but decrease the distance by 2cm each time you repeat.

### **Risk Assessment**

- Make sure if you are using anything valuable as a light source (e.g. phone), then make sure it is held properly

### **Diagram**

**Object** – highlighter (12 cm)

### Results

DISTANCE OF LIGHT FROM OBJECT (CM)	SHADOW LENGTH (CM)
54	12
52	12.2
50	12.4
48	12.6
46	12.8
44	13
42	13.2
40	13.4
38	13.6

### Conclusion

From our results, the distance of the light source to the object affects the length of the shadow. When the height is 54cm, the shadow length is 12cm. Every time 2cm are decreased, the shadow length becomes 0.2cm longer, until when the distance is 38cm, the shadow length is 13.6cm. The smaller the distance of the light from the object, the longer the shadow is, is what the results tell me.

### Evaluation

Our method was good because it didn't take too long, it was simple and easy to understand. However, the measuring may not have been accurate with our method. Also, we could have done the same investigation with different gaps between the distance, for example, 3cm, 4cm, 5cm etc. We could have done the experiment 3 times to make sure our results are not anomalies and that our results are reliable.