Practical Skills Revision

Practicals 4-6

Practical 4: Investigate the I-V graphs of different components

Jonathan is investigating the I-V properties of different components.

1. Draw a circuit diagram of the circuit he would need to draw the I-V graph for a diode.
2. Draw a blank table of results that he could use.
3. Sketch the I-V graph he should find.

Practical 4: Investigate the I-V graphs of different components

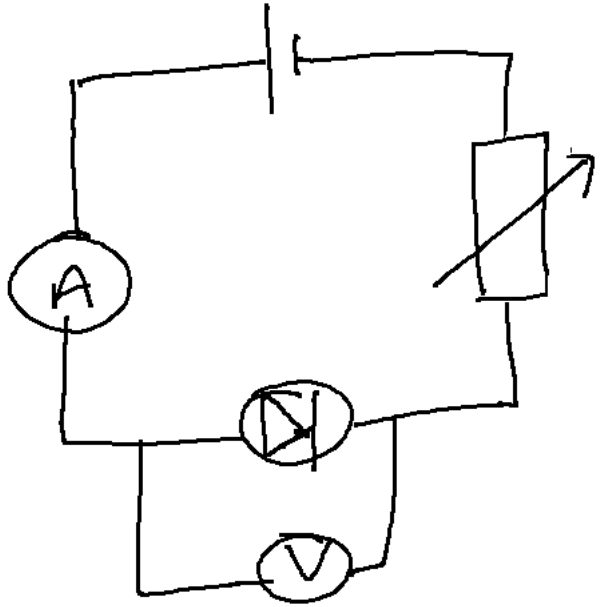
Jonathan finds that when the current through his circuit is 3.8A, the potential difference is 1.06V.

4. What is the precision of his ammeter?

5. What is the precision of his voltmeter?

Practical 4: Answers

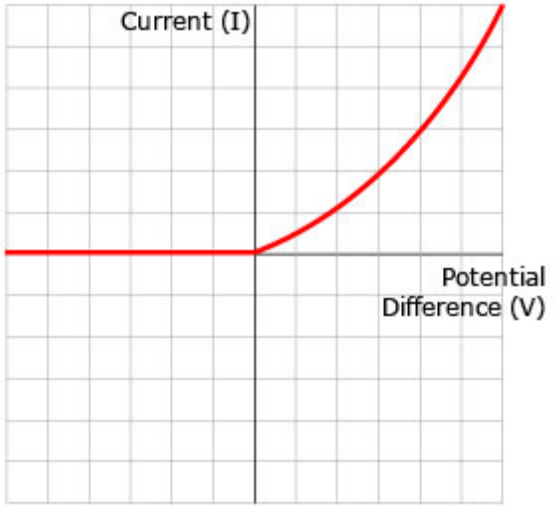
1.



2.

Current/A	Potential Difference / V

3.



4. 0.1A

5. 0.01V

Practical 5: Use appropriate apparatus to determine the densities of regular and irregular solids and liquids.

Emmi is carrying out practical 5. She measures the dimensions of a block of wood. The length is 2.0 cm, the width is 1.0 cm and the depth is 1.5 cm. She measures the mass as 12g.

1. What does she use to measure the length?
2. What is the precision of this measuring instrument?
3. What is the volume of the block?
4. What does she use to measure the mass?

$$Density = \frac{mass}{volume}$$

5. What is the density of the block?

Practical 5: Use appropriate apparatus to determine the densities of regular and irregular solids and liquids.

Emmi next wants to find the density of oil. She measures the volume of some oil.

6. What does she use to measure the volume?

7. What does she need to do to find the mass of the oil?

Practical 5: Use appropriate apparatus to determine the densities of regular and irregular solids and liquids.

Emmi also needs to find the density of the plastic in a lego brick.

8. Write a method for her experiment. Include details about what measuring equipment she should use and how to use it.

Practical 5: Answers

1. A ruler
2. 0.1cm
3. 3 cm^3
4. A balance
5. 4 g/cm^3
6. A measuring cylinder
7. Weigh an empty container then weigh the container with oil in. Find the difference.

8. Use a balance to find the mass of the block. Fill a displacement can with water and put a beaker under the spout. Put the block in the displacement can and catch the water that it displaces. Transfer the water to a measuring cylinder to find the volume of the displaced water.

Practical 6: Investigate the relationship between force and extension for a spring

Libby wants to find out how the extension of a spring depends on the force applied to it.

1. What do we mean by the term “extension”?

Libby clamps a ruler to the stand to measure the extension.

2. Why is it important that the ruler is vertical?

3. How can she make sure that it is vertical?

Practical 6: Investigate the relationship between force and extension for a spring

Force /N	Extension 1 /cm	Extension 2 /cm	Extension 3 /cm	Mean /cm
1	6.5	6.8	6.2	
2	7.8	7.9	8.0	
3	9.6	9.5	9.9	
4	11.0	11.1	11.0	
5	12.4	12.5	12.3	
6	14	14.2	18	

4. Where is the anomalous result in this data?
5. Calculate the mean values.
6. What is the uncertainty in the extension for the smallest force?
7. Draw a graph to show these results.

Practical 6: Investigate the relationship between force and extension for a spring

Libby knows that force is supposed to be directly proportional to extension.

8. What should her graph look like?

9. What did Libby do wrong in her experiment?

Practical 6: Answers

1. The difference between the length and the original length
2. Because otherwise the measured length will be too short
3. Use a plumb line
4. Trial 3 for a force of 6N
5. 6.5, 7.9, 9.7, 11.0, 12.4, 14.1
6. (6.8-6.2)/2 = 0.3cm
7. Graph
8. Straight line through the origin
9. She has forgotten to subtract the original length from each of her results.