

Physics laboratory safety precautions / rules:

- * Live wires should not be touched.
- * Hot Objects should not be touched with barren hands instead of that gloves should be used the most common process is heating of water in thermodynamic experiments.
- * Circuit connections should be checked and approved by the teacher and then only the circuit should be switched ON.
- * While changing components of the circuit the power should be switched so that one should not experience electric shocks.
- * Safety spectacles, gloves and other safety components should be used while handling experiments.
- * While handling a mercury thermometer one should take of the mercury spills.
- * No other laboratory instruments should be touched or handled which is not involved in the course of experiments.

micrometer : can measure the thickness of any small thing to 0.01 mm

vernier : can measure the inner and outer wall of anything to 1.05mm

Control Variables

Precautions

Units (eg.. voltage is V etc.) cause the units hold 1 mark of the question

Statements & justification

The rest are calculations and measurements

To produce more accurate or reliable results:

- Repeat experiment, to calculate average reading.
- Avoiding parallax error, look perpendicular to the ruler.
- If accuracy in measurement was asked, check for zero error.

Improvements that could be done to the experiment (temp. cooling):

- Same initial temperature.
- Same volume of water.
- Same shape of beaker.
- Beakers of same surface.
- Same room temperature.
- Stirring the water in the beakers.
- Same time intervals.
- Same surface area. (Unless given different containers)
- Adding water or cooling effect at regular intervals.

Heat loss could be reduced by:

- Insulation of beaker.
- Covering beaker with a lid.

For 2 values to be directly proportional,

- The graph of the values must be a straight line from the origin.
- As value 1 increase, value 2 increases.

For images produced from lenses on screens, precautions taken:

- Use of a darkened room for the experiment.
- Avoiding parallax error in measurement, and look perpendicular to the ruler.
- Object and lens at the same height from bench.
- Object/lens/screen is perpendicular to the bench.

To draw an image created from lens:

- Inverted from the original object.
- Sides are multiplied by the magnification.

*If values have difference by 0.1 or 0.01, that is the limit of experimental accuracy, so answers are about the same.

For spring extension experiment, variables that should be constant in the experiment:

- Number of coils.
- Diameter of spring.
- Selection of loads.
- Mass of spring.

http://www.opamp-electronics.com/tutorials/experiments_ch_003.htm

for improving the accuracy of the results (for experiments):

Minimizing heating effect of a current:

- Lower current
- Increase voltage
- Add a lamp
- Increase resistance of a resistor

To increase accuracy of ray diagrams

- View bases of pins since pins may not be vertical
- Keep pins further apart
- Use more pins
- Avoid parallax, explain action and reason
- Repeats and average

Adjustments made to experiments will be made to increase accuracy

Improvement made to experiments about heating effect and insulation

- Lids
- Repeats
- Stirring
- Record max. Temperature
- Add insulation

- Keep constant room temperature
- Avoid heat loss

How to check if a rule is vertical:

- Protractor
- Use of set square
- Plumb line
- Spirit Level

Drawing graphs:

- Label axis
- Choose a proper scale
- Well judged best fit line
- Thin and neat lines

Measuring the gradient:

- Draw a triangle on graph
- Use clear lines
- Triangle must be larger than half the line

Sources of error in calculating circumference by string method:

- Parallax
- Diagonal winding
- Thickness of string

Improvement made to calculating circumference by string method

- Avoid parallax error
- Repeats and average
- Thinner string
- Parallel winding of springs

It's not the BEST list in the world, but hopefully it will help...

Control Variables

Precautions

Units (eg.. voltage is V etc.) cause the units hold 1 mark of the question

Statements & justification

The rest are calculations and measurements which are easy.. they provide the equation in the question