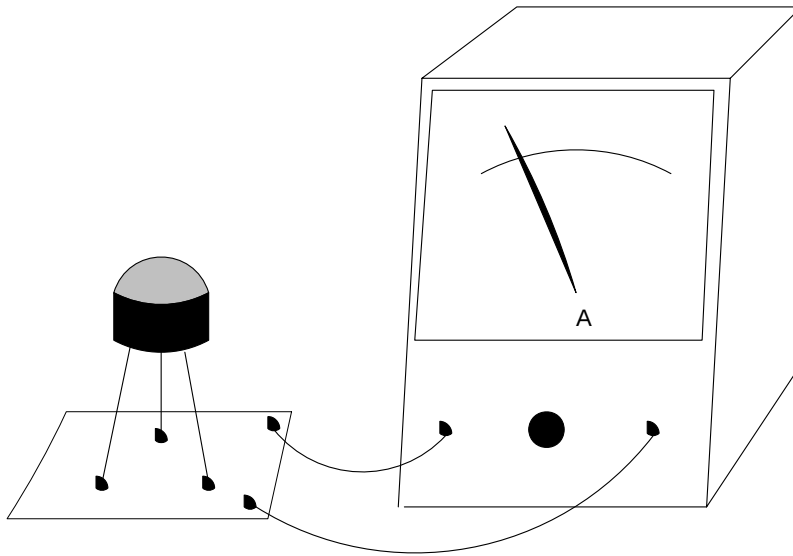


Appendix A - Probes

Page: 1

Context:

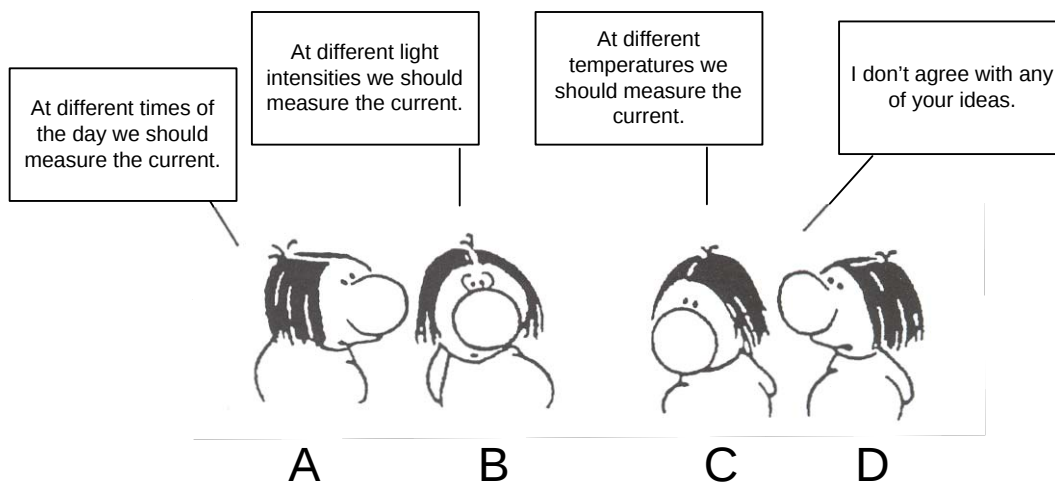
A solar cell is a small electrical power supply. It produces a current from a radiation source, for example from a lamp or from the sun.



Some students were provided with a solar cell and an ammeter connected across the solar cell with two leads. They were also given a clock, a thermometer and a light intensity meter. They were told they could do their experiment inside or outside.

The students were asked to find out how the current I changes with the amount of radiation.

- The students went to an open area outside. They argued about what they needed to measure.

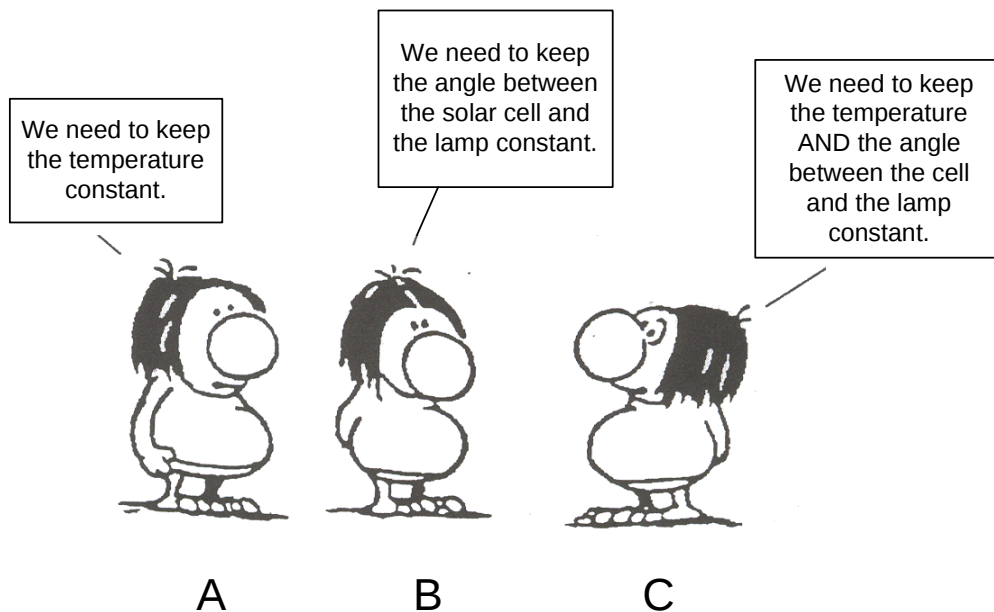


With whom do you most closely agree? (circle one)

A	B	C	D
---	---	---	---

Explain your choice.

2. The students argue about what variables they need to keep constant.

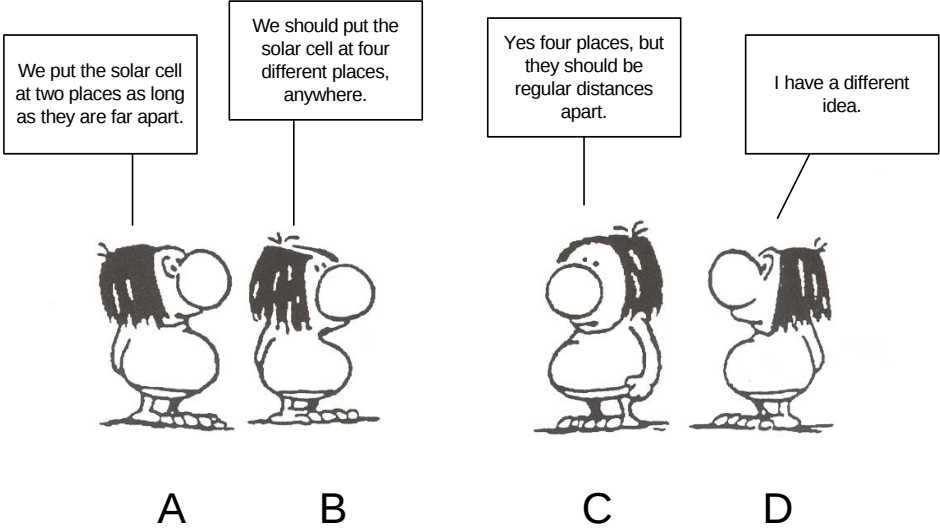


With whom do you most closely agree? (circle one)

A	B	C
---	---	---

Explain your choice.

3. The students want to agree on how many measurements of the current as a function of the light intensity they have to take. They will vary the light intensity by changing the distance between the lamp and the solar cell.



With whom do you most closely agree? (circle one)

A	B	C	D
---	---	---	---

Explain your choice.

Appendix B – Coding scheme

CODING SCHEME FOR PROBE1 (Valid Independent Variable (IV))

- N00 - No response

- A00 - A response, but no explanation
- A01 - A response not codable
- A10 - Different times of the day will provide different/varied readings
- A20 - Time of day = IV (represents radiation)
- A21 - Time of day affects CURRENT, since solar cell produces varying amounts over the day

- A30 - Time of day = IV, as it also covers varying light intensity
- A35 - Time of day = IV, as it also covers varying temperatures

- A40 - Time of day = IV, as it also covers variations in light intensity and temp
- A41 - Time of day, also changes light intensity and temp, they all affect V

- B00 - B response, but no explanation
- B01 - B response uncodeable
- B10 - Different light intensities will provide different/varied readings
- B20 - Light intensity = IV (represents radiation)
- B21 - Light intensity affects CURRENT
- B22 - Light intensity, since this is the most convenient measurement
- B23 - Light intensity affects resistance, which you need to vary in order to calculate CURRENT (with Ohm's law).
- B24 - Sun offers different light intensity.
- B25 - The aim of the experiment is to measure light intensity
- B26 - Temperature is not a variable in this experiment

- B27 - The angle affects light intensity
- B35 - Light intensity affects temperature and current
- C00 - C response, but no explanation
- C01 - C response uncodeable

- C20 - Temperature = IV (represents radiation)
- C21 - Temperature affects CURRENT
- C23 - Temperature affects the RESISTANCE, thus changing the current.
- C50 - To get a variety of results

- D00 - D response, but no explanation
- D01 - D response, but uncodeable

- D10 - Current has nothing to do with time of day, light intensity or temperature -
- D11 - Current has nothing to do with temperature.
- D13 - Calculate I from V & R.

- D20 - radiation = IV, not time of day, light intensity or temperature.

- D30 - Time of day PLUS light intensity need to be varied
- D34 - Temperature PLUS light intensity need to be varied

- D41 - Time of day PLUS temperature PLUS light intensity all affect CURRENT

CODING SCHEME FOR PROBE 2 (Valid Controls)

- N00 - No response

A We need to keep the temperature constant

- A00 - A response, but no explanation
- A01 - A response uncodeable

A10 - because temperature always has to be kept constant

A20 - otherwise changes in temperature affect the measurements

A21 - otherwise changes in temperature register as differences in light intensity

A30 - in order to get good quality measurements

A33 - in order to get a constant current

A40 - but it's unnecessary to keep the angle constant as long as light reaches the cell

A50 - you can't keep the temperature constant (Gas laws)

A54 - in order to calculate the angle

A60 - so that we can investigate the relationship between angle and current

B We need to keep the angle constant

B00 - B response, but no explanation

B01 - B response uncodeable

B20 - changes in the angle have an effect on the measurements

B21 - changes in the angle register a difference in the light intensity

B30 - in order to get accurate measurements

B33 - in order to get a constant current

B41 - but it's unnecessary to keep the temperature constant - we need measurements at different temperatures

B50 - but temperature can't be kept constant (Ohm's law)

B51 - but temperature can't be kept constant (close/away from the light)

B52 - only thing we have control over

B53 - temperature is not a variable

C We need to keep temperature AND angle constant

C00 - C response, but no explanation

C01 - C response uncodeable

C10 - if we allow the temperature/angle to vary, you'll need to measure these too

C20 - otherwise changes in temperature and angle will affect the current

C21 - otherwise changes in temperature and angle will affect the heat absorbed by the solar cell

C30 - in order to get accurate measurements

C31 - in order to avoid errors

C32 - in order to get the proper answer

C33 - in order to get the same values

D20 - neither has a major effect on the measurements

CODING SCHEME FOR PROBE 3 (Valid Interval and range of IV)

N00 - No response

A00 - A response, but no explanation

A01 - A response uncodeable

A30 - Measurement at two places for easy calculations

B00 - B response, but no explanation

B01 - B response uncodeable

B20 - Don't fix but vary measurement intervals

B25 - Any distances will do; radiation varies due to change in distance

B30 - 4 measurements at different places anywhere allows calculating the voltage

B31 - 4 measurements at different places anywhere allows calculating the current

B40 - 4 measurements at different places are needed to calculate an average

B50 - to see which is better

B51 - you need different/varied results

B60 - you need to put it in 4 different directions

B70 - you need different results in order to get a patten/trend

C00 - C response, but no explanation

C01 - C response uncodeable

C10 - to be more accurate

C11 - *to have good readings*

C28 - you need regular intervals

C29 - you need regular intervals; the higher the distance the higher the voltage

C30 - 4 measurements at regular intervals will make calculations easier

C31 - 4 measurements at regular intervals should produce a 'scale format'/helps graphing/provides a pattern

C32 - 4 measurements at regular intervals should have ratio; we can check errors

C33 - 4 measurements at regular intervals would mean they are far apart

C40 - 4 measurements should be at the same distance (quadrangle)

C41 - 4 measurements allow for nice averaging

C50 - 4 measurements at different places allows for choice which place is best

D00 - D response, but no explanation

D01 - D response, but uncodeable

D20 - Don't fix measurement interval, four distances are OK

D25 - position does not matter, you want the voltage

D26 - position does not matter as long as the solar cell is in the light

D28 - you need regular intervals, take as many measurements as needed

D30 - take more than 4 regularly spaced distances for more accurate calculations

D31 - take more than 4 measurements regularly spaced to determine a pattern

- D40 - Use 4 different places but the same, not different, distances (*and average*)
- D41 - Take 3 measurements at a good distance and take the average
- D42 - Take more than 4 measurements and average
- D45 - You'll get the same measurement anyway
- D50 - Take distances close together not far apart
- D51 - Take all the readings you need
- D60 - Go outside to get more light.

Appendix C – Model of students’ understanding of validity

Level descriptor	Level code	Probe 1 Focus on selecting the independent variable...	Probe 2 Focus on identifying control variables	Probe 3 Focus on determining interval and range
Focus on seeing a trend	A			3.1. Seeing a trend or pattern emerging
Focus on processing or quality of calculations	B			3.2. Quality of the calculation
Focus on quality of measurement	C		2.1. The effect of variables on the quality of measurements	3.3. Effect of regular or irregular intervals on the quality of the set of measurements
Focus on nature of what is to be measured	D		2.2. The effect of variables on measurements	
Focus on features of the variable	E	1.1. IV representing other variables influencing IV 1.2. Single IV influencing Dependent variable (DV) 1.3. Several variables as IV, all influencing DV 1.4. IV resulting in a variation of measurements	2.3. The practical impossibility of controlling a variable	
Focus on measurements procedures	F			
Focus on physical aspects of the set up	G			3.4. Physical aspects of set up
Focus on an algorithm	H	1.5. IV allowing substitution in algorithm		3.5. The need for repeating identical measurements

Level descriptor	Level code
Focus on seeing a trend	A
Focus on processing or quality of calculations	B
Focus on quality of measurement	C
Focus on nature of what is to be measured	D
Focus on features of the variable	E
Focus on measurements procedures	F
Focus on physical aspects of the set up	G
Focus on an algorithm	H

Abbreviated version of the model of progression in students’ understanding of validity.

APPENDIX D – CLASS TASKS

CLASS TASK 1- THE WATER ROLLER



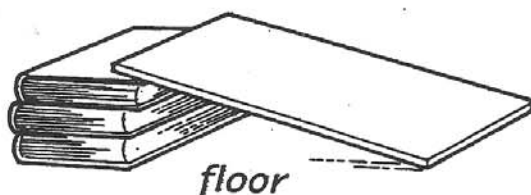
Beware the water roller!

You will need:

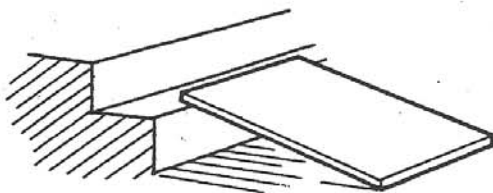
a plastic drinks bottle

a yoghurt pot (or margarine tub)

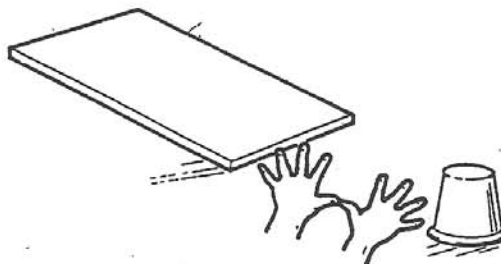
a tray (or short plank of wood)

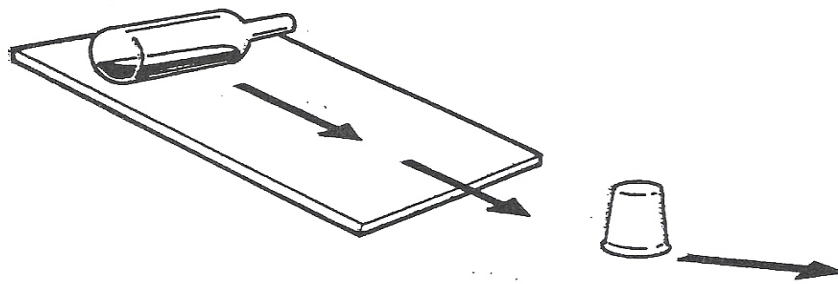


*~ Prop up the tray on a pile
of books **or** the step of a
staircase.*



*~ Place the yoghurt pot
upside down 2 handspans
from the end of the tray.*





~ Let go the water bottle roller.

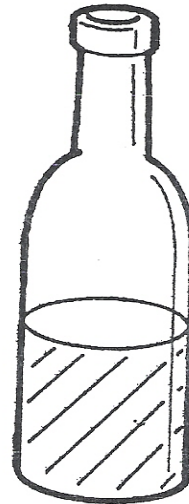
How far does it push the yoghurt pot this time?

handspans

Is the water sloshing inside the bottle?

~ Pour more water into the bottle roller.

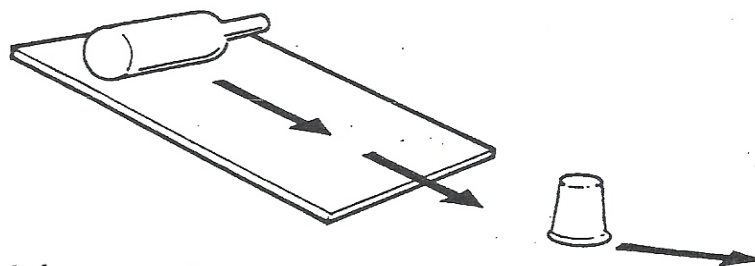
~ Make sure the top is screwed on firmly.



~ Put the yoghurt pot back so as to have a "fair test".

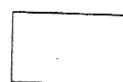
What do you think this water roller will do to the yoghurt pot?

~ Put the empty bottle at the top of the tray and let it roll down.

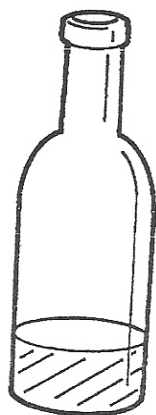


~ Measure with your hands.

How far was the pot pushed along?



handspans



~ Pour some water into your bottle roller.

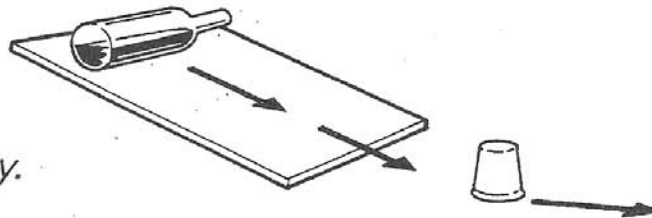
~ Ask someone to help you to screw on the top very firmly.

~ Put the yoghurt pot back at 2 handspans from the end of the tray.

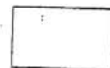
~ Lift the bottle to the top of the tray again.

What do you think the bottle will do to the yoghurt pot this time?

~ Let the water roller go
from the top of the tray.



How far did it push the yoghurt pot?



handspans

**Draw a picture of your investigation and take it
back to school.**

NOTES FOR PARENTS

This activity can be done on the kitchen floor, or on a carpet. (The bottle will go further the first way.) **It is important to make sure the top is firmly screwed on to the bottle!**

Your child will be measuring using handspans, as is often done at this age in school. Please help with the recording. Do encourage your child to try to predict what will happen. When the bottle has water in it and is

raised to the top of the tray it has energy which is stored until the bottle goes. Pushing the yoghurt pot along shows how much energy it has. It is like the energy of a steam-roller!

CLASS TAST 2- HEAT AND ELECTRICITY

Lesson 12:

HEATER

This lesson relates to electrical appliances which are used to provide heat. Students classify appliances and then investigate the heating effect of an electric current. Students then design their own experiments to investigate the effect of coiling on the heat produced. Teacher and students discuss the procedures used in the student designed experiments. The lesson ends by illustrating the elements in various electrical heaters and stressing the need for safety in using all electrical appliances.

ACTIVITY	OUTLINE	KEY POINTS
Teacher-student discussion 1	Teacher and students discuss various electrical appliances and classify them into those that are used to produce heat and those that are not.	Some electrical appliances are designed to produce heat.
Laboratory-based practical	Students investigate the heating effect of passing an electric current through wire, measuring the temperature rise in water. The heat energy produced is calculated. Students design and carry out their own investigation of the effect of coiling of a wire on the heat produced.	An electric current increases the temperature of the wire it flows through. The higher the resistance of the wire the greater the heating. Experimental design requires just one factor to be varied while others are held constant.
Teacher-student discussion 2 and teacher demonstration	Teacher and students discuss and explain the experimental results. Teacher demonstrates various electrical heaters to highlight the element and to stress the need for safety.	Electrical heaters have an element containing a coil of high resistance wire insulated from other parts of the appliance. All electrical apparatus must be handled with care.

KEY ACTIVITIES AND TECHNIQUES

classification
experimental design
testing ideas

REQUIREMENTS

Laboratory based practical work
Student Activity Guide-
(per group)

8 cells (or a car battery)
1 metre nichrome wire (swg 28)
connecting wires
100 cm³ beaker
measuring cylinder
thermometer

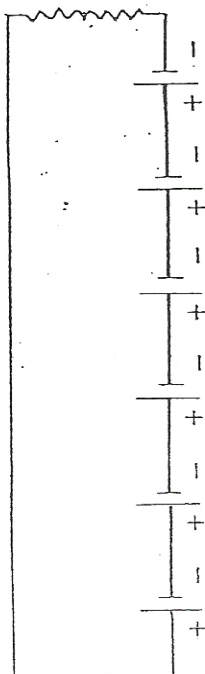
Teacher demonstration
any electrical heaters
elements from old kettles cookers etc.

HEATER

STUDENT ACTIVITY GUIDE

Your teacher will demonstrate how to make an *immersion coil* from some nichrome wire.

Connect up the circuit below using either 6 cells or a car battery.



Half fill a 100 cm³ beaker with cold water.

Place the coil in the beaker of water.

Measure and record the temperature of the water.

Switch on the circuit.

Wait for 5 minutes.

Measure and record the temperature again.

1: What is the first temperature reading?

2: What happens when the switch is closed?

3: What is the second temperature reading?

4: What energy changes have taken place in your circuit?

5: What conclusion can you draw from your observations?

6: Calculate the heat energy produced by your coil by using the following formula:

mass of water X temperature change X 4.2 = heat energy (in Joules)

Plan your own experiment to investigate if the number or size of turns on the immersion coil has an effect on the heat energy produced. You should consider the following points.

how many different numbers (sizes) of turns on the coil will you try?

how long will you leave the coils in the water?

how much water will you use?

how will you tell if there is a difference?

what factors will you keep constant?

what factors will you vary?

7: Use this space to write your plan.

Let your teacher check your plan to make sure that what you wish to do is safe.

8: Use this space for your table of results.

9: What conclusions can you draw from your results?

10: Explain your conclusions.

11: How could your plan have been improved?

CLASS TASK3 – THE PENDULUM

The purpose of this lesson is to examine what factors affect the period of a simple pendulum. Students identify factors affecting the motion of a pendulum in a teacher led discussion. Students then design their own experiments to investigate the effect of length, mass, and amplitude (size of the arc through which the pendulum swings) on the period of the pendulum. Teacher and students discuss the procedures used in the student designed experiments. The lesson ends by having each group report back to the class with their findings.

ACTIVITY	OUTLINE	KEY POINTS
Teacher-student discussion 1 and teacher demonstration	Teacher demonstrates how to make a simple pendulum. Teacher and students discuss various factors affecting the period of a simple pendulum.	If we suspend a stone at the end of a piece of string, we have a simple pendulum. A pendulum consists of mass (known as a bob) attached by a string to a pivot point. As the pendulum moves it sweeps out a circular arc, moving back and forth in a periodic fashion.
Laboratory-based practical	Students design and carry out their own investigation of the effect of the length of the pendulum, mass and size of the arc on the time it takes to-and-fro through small distances (period). The period of a simple pendulum is calculated.	The time a pendulum takes to swing to and fro through small distances depends only on the length of the pendulum and the acceleration due to gravity.* The time to-and-fro swing, called the period, does not depend on the mass or on the size of the arc through which it swings. Experimental design requires just one factor to be varied while others are held constant.
Teacher-student discussion 2	Teacher and students discuss and explain the experimental results.	A long pendulum has a longer period than a shorter pendulum; that is, it swings to and fro less frequently than a short pendulum.

KEY ACTIVITIES AND TECHNIQUES

classification
experimental design
testing ideas

REQUIREMENTS

Laboratory based practical work

Student Activity Guide (per group)
various lengths of string
various weights to hang (bobs)
stop- watch

PENDULUM

STUDENT ACTIVITY GUIDE

Your teacher will demonstrate how to make a simple pendulum.

Plan your own experiment to investigate if the **length of the pendulum, mass of the bob or size of the arc through which the pendulum swings** has an effect on the period of the pendulum. You should consider the following points:

how many different lengths, weights or sizes of the arc will you try?
how will you tell if there is a difference?
what factors will you keep constant?
what factors will you vary?

Let your teacher check your plan to make sure that what you wish to do is appropriate.

Use the investigation planning and report sheet provided to write your plan and record your findings.

APPENDIX E

Science Investigations: planning and report worksheet

Name: _____

Other members of your group: _____

What are you going to investigate?

What do you think will happen? Explain why.

Which variables are you going to:

- change?
- measure?
- keep the same?

How will you make it a fair test?

What equipment will you need?

What do your results tell you? Are there any relationships, patterns or trends in your results?

Can you explain the relationships, patterns or trends in your result? Try to use some science ideas to help explain what happened.

What did you find out about the problem you investigated? Was the outcome different from your prediction? Explain.

What difficulties did you experience in doing this investigation?

How could you improve this investigation e.g. fairness, accuracy?

What happened? Describe your observations and record your results.

Can your results be presented as a graph?



APPENDIX F– THE CTA INVESTIGATION TASK



Question 2 An investigation

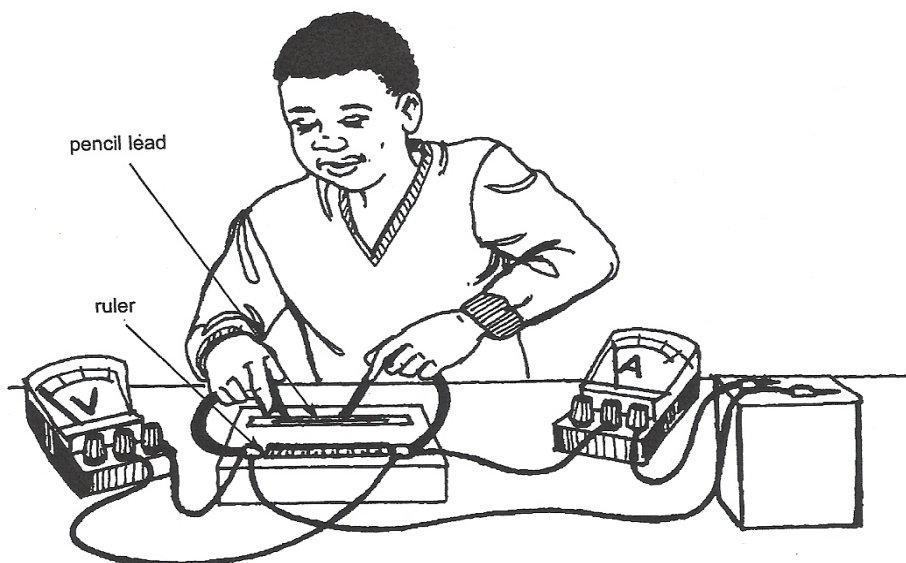
✓ Marks: 21

To convince their parents that they know about electricity and the investigative method, the children plan an investigation that they can use to show their knowledge and skills. They decide to show their parents that 'pencil lead' is a conductor of electricity which has electrical resistance. This increases with an increase in the length of the piece of pencil lead.

They collect 6 new pencils. 2 of the pencils have 'hard lead' (labelled 2H), 2 'soft lead' labelled HB and 2 very 'soft lead' labelled 2B. They slit the pencils lengthwise to get the 'lead' out. They also have 2H, HB and 2B 'pencil lead' for clutch pencils which are 0.5 mm and 0.7 mm thick.

They borrow two electrical meters from their neighbour who works as an electrician. The electrician sets the one meter to read current in amps and the other to read potential difference (or voltage) in volts.

They set up the circuit as shown in the sketch and record the results indicated in the table.



Symbols for parts of a circuit:



light bulb



voltmeter



ammeter



resistor



battery

	Length of pencil in circuit (cm)	Voltmeter Volts - (V)	Current Amps (A)	Resistance = $\frac{\text{voltage}}{\text{current}}$ ohms (Ω)
1	2.5	0.42	0.28	1.5
2	5.0	0.75	0.25	3.0
3	7.5	0.99	0.22	4.5
4	10.0	1.2	0.2	6.0

- 2.1 Describe a variable that they should control (keep constant). (1)
- 2.2 Which variable do they change (independent variable)? (1)
- 2.3 Which variables do they measure using meters? (2)
- 2.4 Which variable do they calculate? (1)
- 2.5 Which variable is the dependent variable in their investigation? (1)
- 2.6 Write down the matter they investigate. (2)
- 2.7 Describe, in writing, the method they follow to answer the problem they are investigating.
Include a circuit diagram. (5)
- 2.8 Draw a graph of resistance against the length of the pencil lead included in the circuit.
Fully label the axes and give your graph a heading. (3)
- 2.9 Give the conclusion the children reach using the graph of their results.
(Give the conclusion in words and mathematical symbols.) (5)

APPENDIX G – MEMORANDUM FOR THE CTA INVESTIGATION TASK



Question 2 An investigation

- 2.1 Describe a variable that they should control. (1)
 The thickness of the pencil lead.
 The type (hardness) of the pencil lead.
 Other.
- 2.2 Which variable will they change? (1)
 The length of the piece of pencil lead connected in the circuit.
- 2.3 Which variable(s) will they measure? (2)
 Voltage across the pencil lead and
 the current through the pencil lead.
- 2.4 Which variable do they calculate? (1)
 The resistance.
- 2.5 Which variable is the dependent variable? (1)
 The resistance.
- 2.6 Write down the question they wish to investigate. (2)
 How is the resistance ✓ of 'pencil lead' affected ✓ by its length ✓?
 One ✓ correct answer gives 1 mark, for two marks the learner must get all three ✓.

MARK ACCORDING TO THE MEMORANDUM ABOVE. The rubric shows how the marks attempt to link to a rate of achievement of the outcome.

Rubric for marking 2.1 to 2.6

NSS01 Process skills (AC 2 – Investigative question formulated and variables to be controlled identified.)

	%		Description of rating
1	<35	0-2	Identifies up to two variables of a particular type
2	35-39	3	Identifies up to three variables of a particular type
3	40-69	4 - 5	Identifies up to four variables of a particular type or formulates the investigative question satisfactorily
4	>70	6 - 8	Identifies up to four variables of a particular type and formulates the investigative question satisfactorily

- 2.7 Describe, in writing, the method they should follow to answer the question they are investigating. Include a circuit diagram.

MARKING:

MARK THE CIRCUIT DIAGRAM
ACCORDING TO THE MEMO BELOW:

Draw a circuit diagram

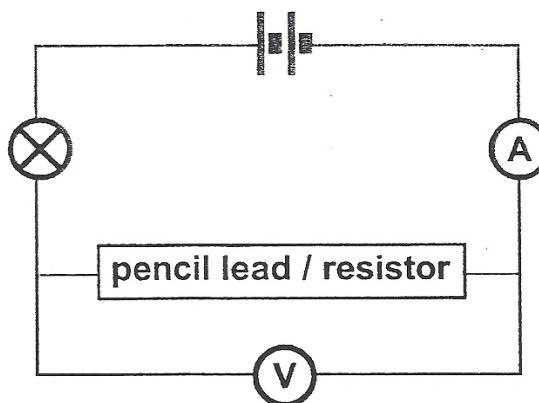
There is a complete circuit. (1)

The battery, ammeter and bulb are in series
with the resistor. (1)

The voltmeter is across and in parallel with
the 'pencil lead' resistor. (1)

One correct answer gives 1 mark;
for two marks must get all three answers
correct. (2)

NSSO1 Process skills (AC 2 – A plan of action is formulated.)



MARK THE DESCRIPTION OF THE METHOD ACCORDING TO THE MEMO BELOW

(1 mark per point up to a maximum of 3):

Method for the investigation.

- 1 Vary the length of 'pencil lead' in the circuit (change input variable); (1)
- 2 Control variables e.g. ensure the hardness and thickness of the pencil lead is always the same. (1)
- 3 Take voltmeter and ammeter readings; i.e. Record/ measure output variable (resistance is the ratio of V to I) (1)

(5)

- 2.8 Draw a graph

MEMO FOR MARKING GRAPH

Correct labels give (1) mark, viz. at least two of *

*Appropriate heading

*Appropriate label on 'x-axis' and 'y-axis'

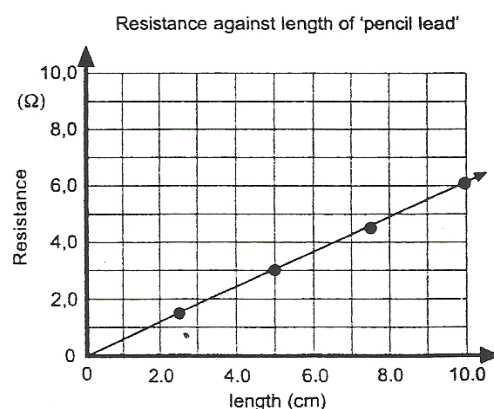
*Appropriate unit on 'x-axis' and 'y-axis'

Suitable scales on 'x-axis' and 'y-axis'

Points plotted correctly and draws straight
line

(1)

(1)



- 2.9 State a conclusion

(3)

We do this by answering the question we were investigating, using the results we found from our experiment.

- 1 The greater the length of the 'pencil lead', the greater the resistance of the 'pencil lead' (1 only)

- 2 Resistance of the 'pencil lead' is directly proportional to the length of the 'pencil lead'.
Relationship in words (2 only)
- 3 Resistance of the 'pencil lead' is directly proportional to the length of the 'pencil lead' provided the thickness, the type and the temperature are kept constant. Relationship in words plus conditions (3 only)
- 4 $R \text{ pencil lead} \propto (\text{length of pencil lead})$ (a relationship in symbols) (+1)
- 5 $R \text{ pencil lead} = 0.6 (\text{length of pencil lead})$ (an equation) (+ 2)

This means a learner who gives 3 and 5 gets 5/5; 3 and 4 gets 4/5, See the rubric for more guidance.

(5)

MARK ACCORDING TO THE MEMORANDUM ABOVE.

The rubric shows how the marks attempt to link to a rate of achievement of the outcome.

	%		Description of rating
1	<35	0-1	Describes a trend
2	35-39	2	Gives the relationship in one way (words)
3	40-69	3	Relationship in words and symbols, but no equation
4	>70	4 - 5	Relationship in words, plus conditions, plus equation (5)

Appendix G - Rubric for Open Investigation

1. Planning and Identification of Problem

25%

Level 1	Level 2	Level 3	Level 4
0-10	11-14	15-19	20-25
- problem poorly stated or not stated - lacks of understanding of control of variables - design poor or absent	- problem stated but variables not clearly defined - some variables identified - shows understanding of concept of variable control - prediction made - design identifiable but does not take account of all factors	- problem coherently state in terms of variables to be investigated - other variables identified and controlled - Sensible prediction made - design appropriate for problem formulated	- meets level 3 criteria and in addition: - shows awareness of significance of variables - all possible variables identified - plan reformulated after pilot

2. Execution of Experiment

25%

Level 1	Level 2	Level 3	Level 4
0-10	11-14	15-19	20-25
- only one or no readings taken - data shows no pattern - variables changed during execution - range and intervals unsuitable	- takes only the measurement for each set of readings - includes anomalous readings - ignores variations due to problems of execution - lack of system in approach - range even but does not include extreme values	- more than one measurement taken - eliminates anomalous readings with justification - sensible adjustments made to experiment in the light of difficulties experienced - systematic approach to execution - suitable range and interval chosen	- meets level 3 criteria and in addition: - conducts and reports on preliminary trials - shows awareness of accuracy issues

3. Processing and Interpretation of Results

25%

Level 1	Level 2	Level 3	Level 4
0-10	11-14	15-19	20-25
- no tabulation of data - single readings used - independent and dependent variables not correctly identified - non linear or inappropriate scales used on graphs - many errors on construction of graph - uses "dot to dot" technique to draw graph - no graph	- tabled used but not logically set up - has not repeated readings or chooses recurring readings - correctly identifies dependent and independent variable - straight line forced on non linear data - graphs have linear scale but some details not correct on graph - superficial explanation of data trends	- uses average values of duplicate readings - makes sensible tables of data - correctly identifies dependent and independent variable - graphs drawn have sensible scales and points used to draw line of best fit - all details such as units and labels correct on graph - appropriately identifies data trends	- meets level 3 criteria and in addition - takes account of spread of data - extrapolates with good reason

4. Evaluation and Reflection

25%

Level 1	Level 2	Level 3	Level 4
0-10	11-14	15-19	20-25
- findings not related to question asked - no evaluation conducted	- findings related to question asked but not critically evaluated - design not evaluated - anomalous readings ignored - sources of inaccuracy ignored	- evaluates findings related to question asked - shows awareness of design problems - comments on anomalous readings - comments on problems encountered - sources of in accuracy explored	- meets level 3 criteria and in addition: - critically comments on design, execution and processing of results - proposes changes for future executions

APPENDIX H – CONSENT FORM

INDEMNITY

I, the undersigned learner,

ID number:

(ID # Full names and address)

hereby acknowledge that I have been invited to take part in the research project. In addition, I consent the researcher to involve me in the research project.

(If the deponent is a minor his/her parent/legal guardian must countersign this indemnity)

I, the undersigned parent/lawful guardian of the above-mentioned deponent, hereby acknowledge that I have duly assisted my child in making this indemnity.

I also:

- (1) Give permission for the deponent to take part in the research project and to participate in all physical activities.
- (2) Not to hold the State or School responsible for any injuries that may occur during the research project.
- (3) Permission that medical treatment may be administered should it be required.

PARENT/GUARDIAN

Parent/Guardian ID Number: _____

Full names: _____

Address: _____

Telephone Number: _____ Cellular Number: _____