Your Name (capital 1st letters)

H221 Science

Mrs Physics

This person is responsible for your learning

Here is your Science jotter
Look after it or you'll have to buy a new one

Mrs Physics

Class Rules

Ready	Respectful	Safe
Enter the room quietly, calmly and on time;	Raise your hand, and wait for permission before speaking.	Follow the teacher's instructions.
Come prepared for the work with jotters and pen or pencil etc.	Allow people to get on with their work.	Follow the laboratory rules
Complete all homework and hand it in on time	No Put Downs	Do not touch equipment that is not part of your work
Pay attention	Not deface jotters, desks folders, etc.	
	Pay attention	
	At the end of a lesson, when told to do so, pack away quietly, place stools under the desk and leave in an orderly manner.	

LOCKERBIE ACADEMY SCIENCE JOTTER RULES

Your jotter should show us how well you are doing in Science- keep it organised and neat

Following these rules will allow you to keep your jotter organised for revision and will show teachers how well you are doing in Science

1. **Number each page and do not remove any pages.**
2. **Always put a date and a heading so that you can find your work.**
3. **Underline your headings with a ruler.**
4. **Complete a cover page for each topic and make sure it is the start of the topic.**
5. **Always show full working.**
6. **Don't scribble in your jotters, if you have made a mistake, put one line through it e.g. ~~misteak~~.**
7. **Use a pencil and a ruler for diagrams and tables.**
8. **Write clearly and neatly, using appropriate punctuation.**
9. **Don't doodle in your jotters.**
10. **Copy up and missed work- if you lose your jotter, you will have to copy up everything that was in it!**
11. **Take pride in your work.**

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In the first topic in science you will be learning:

- some important safety rules
- how to take various measurements
- how scientists follow procedures while investigating

Safety in the laboratory

https://www.youtube.com/watch?v=MEIXRLcC6RA
Video of the Amoeba Sisters general safety in the Lab- good but American

https://www.youtube.com/watch?v=BRDApYgvDqQ
Or in song, but with omissions and additions, great for whafting!

Always follow your teacher's instructions

Do not enter the laboratory until told to do so by a teacher

Do not touch anything that is not part of your lesson

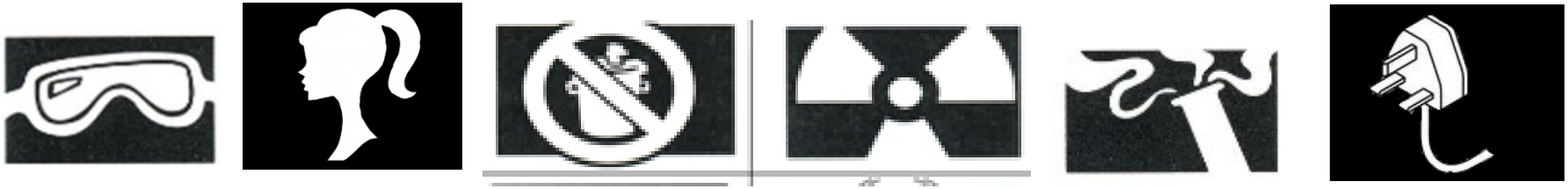
Stick them in and learn these safety rules, they are vital

Lockerbie Academy Science Department

Laboratory Safety

Eye protection must be worn at all times during experiments.

Extra care should be taken around electrical equipment.			Extra protective clothing required - gloves/lab coat.
Take extra care when disposing of chemicals.			Radioactive materials are being used.
Use caution when handling hot objects.			Use of potentially harmful microorganisms.
Harmful fumes could be produced.			Open flames are being used. Long hair must be tied up.



Look at the pictures above, can you remember what these pictures are for?

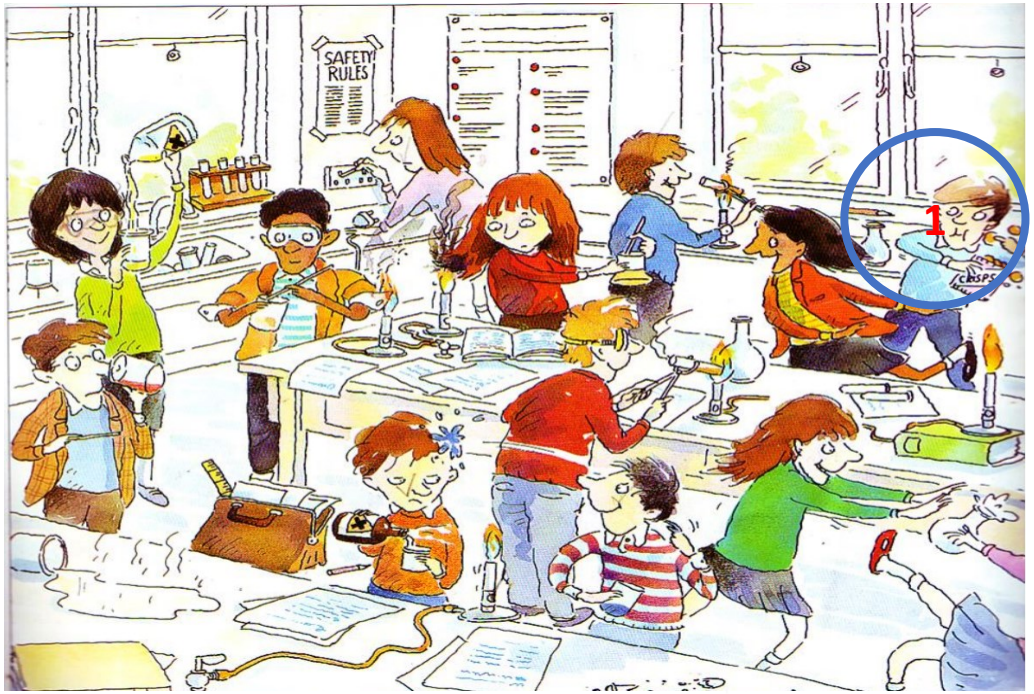
1. **State the rule represented by the picture**
2. **The reason for the rule**
3. **Potential problems if these aren't followed**

put your answers in a table like this:

Safety Rule	Reason	Possible problems
goggles 	Goggles protect your eyes	Chemicals, glass or equipment could get in the eye and cause infection or damage

(remember that we always draw tables using a ruler and a pencil)

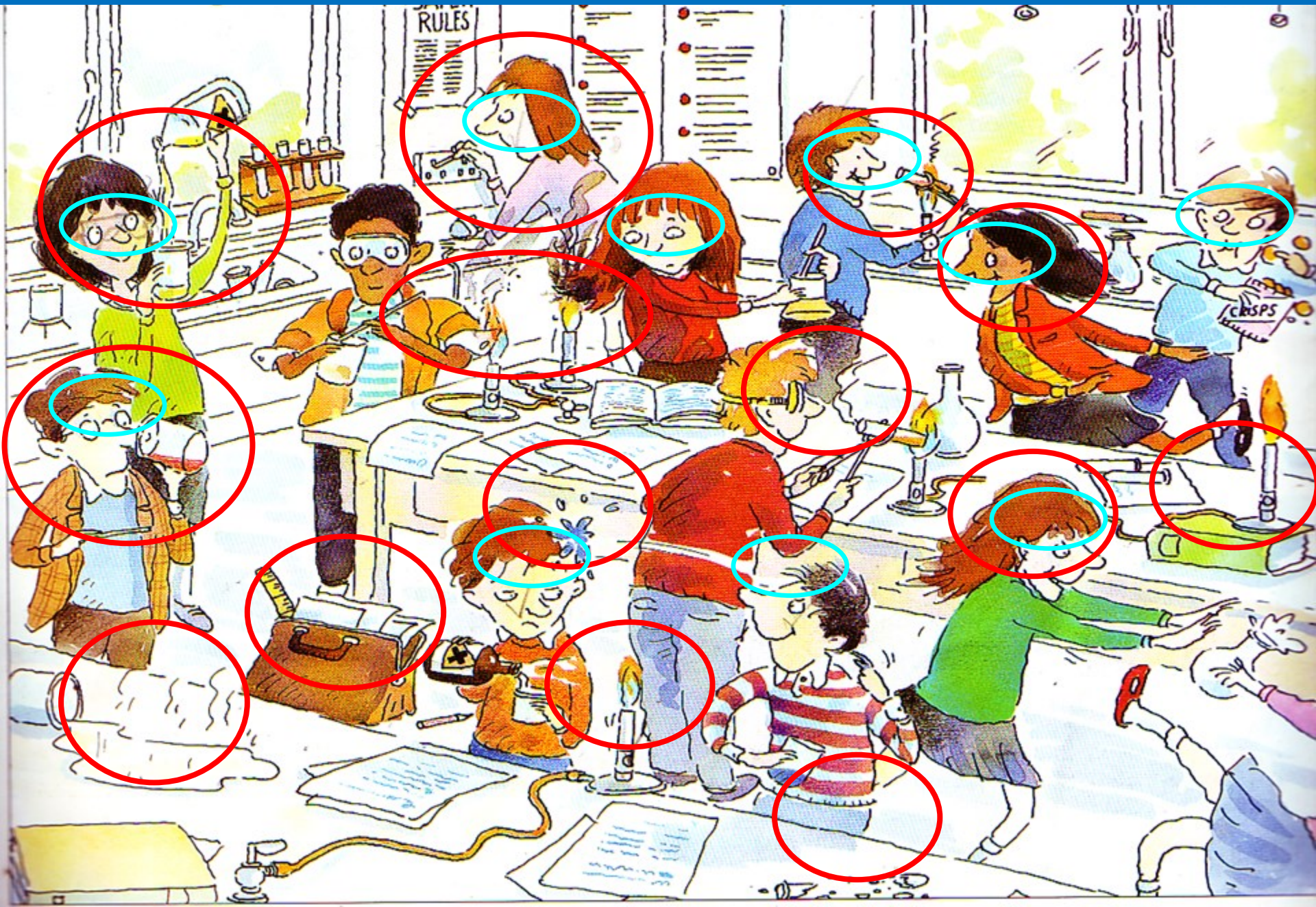
- Stick a copy of the picture of this lab in your jotter,
- <u>Obviously it isn't of a lab at this school!</u>
- Circle all the bad safety practices that we will never see you doing!
- Complete the table



Look at the cartoons and find as many **unsafe** things as you can. **Circle** the unsafe feature and number it. Number 1 has been done for you. In the table below, write down, for each one, why it is unsafe and what should be done to make it safe. Continue the table on the next page.

Unsafe thing	Why it is unsafe	What should be done to make it safe
1. Eating in class	Could catch infection or be poisoned if hands touched germs or dangerous chemicals.	Ban all eating or drinking in a science laboratory and don't touch things around the laboratory.

Review

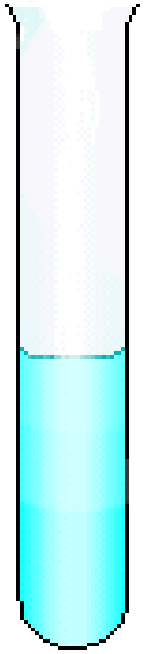


Measuring in Science

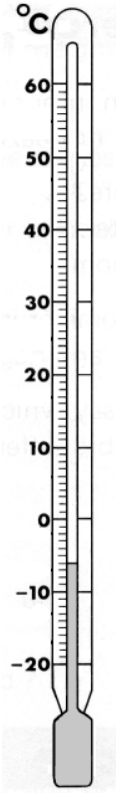
S1 Introduction to Science

Measuring

look in the lab to find out what these pieces of equipment are called then match the drawings to the names



1



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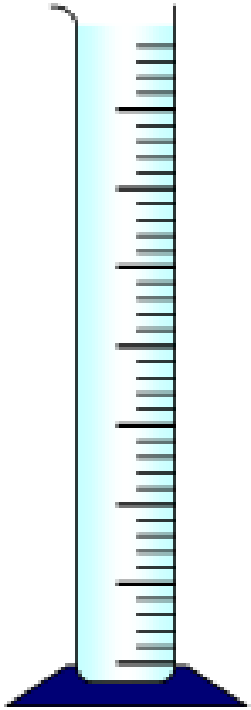


4

thermometer
Термометр

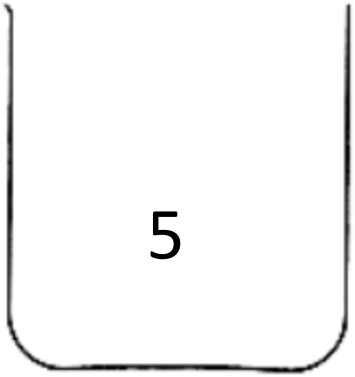
beaker
Мензурка

measuring cylinder
вимірювальний циліндр

test tube
Пробірка

balance
баланс

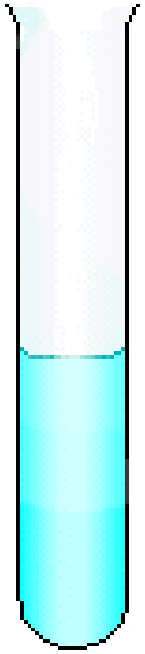
3



5

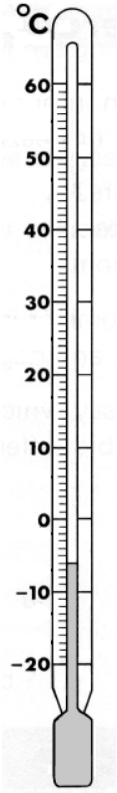
Measuring

now match up the piece of equipment which would be best to measure each of the things below



1

cannot use for measuring

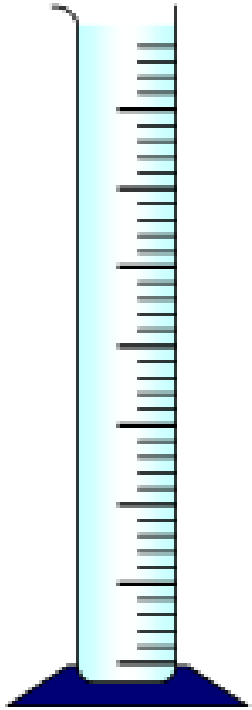


2

TEMPERATURE

3

MASS



4

VOLUME

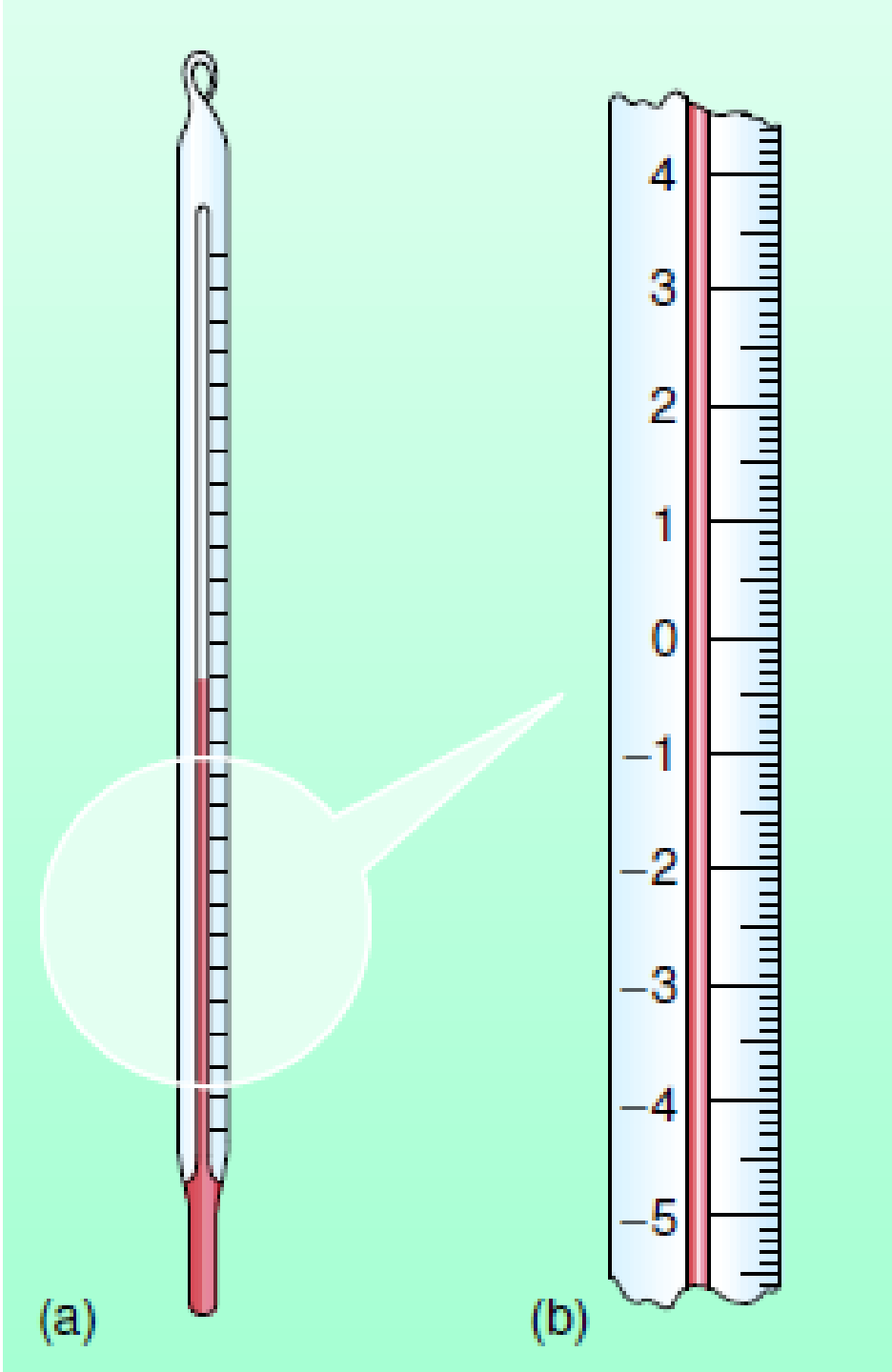
5

cannot use for measuring

Look carefully at the scale on the thermometer

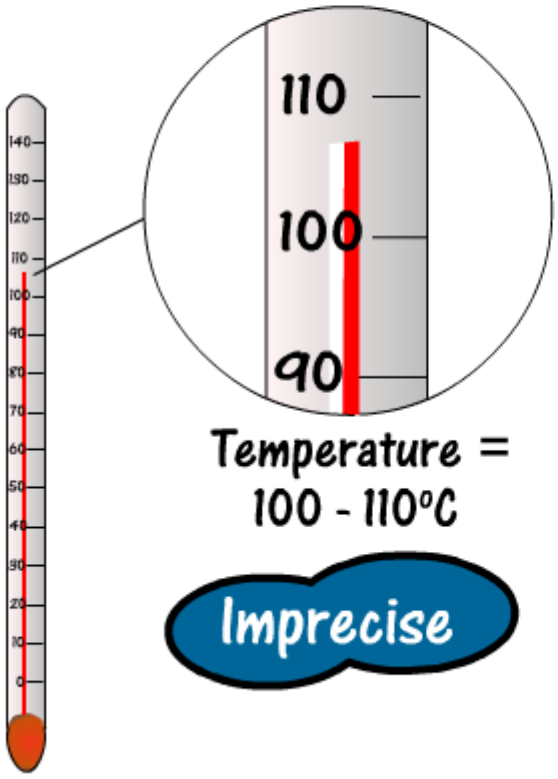
What difference in temperature does the space between each large line represent?

What units are usually used for temperature?



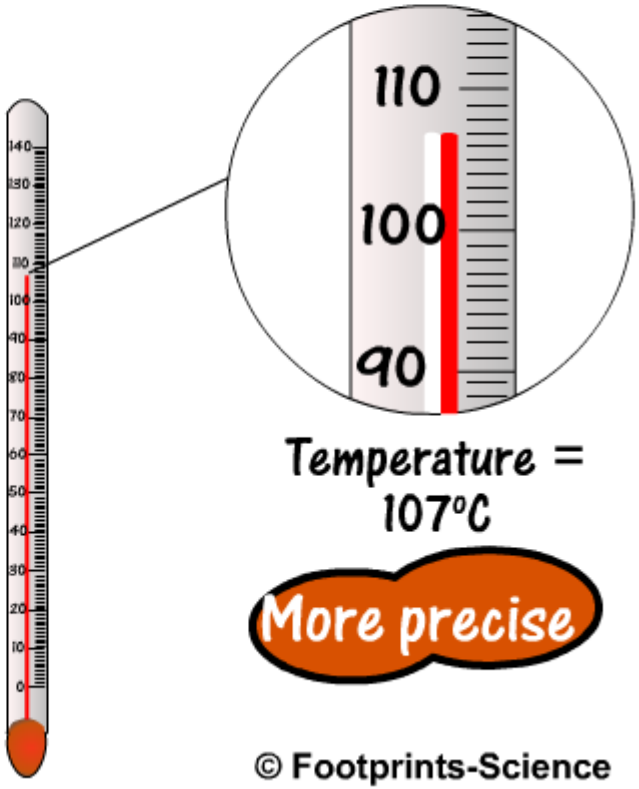
Precision

Precision is related to the smallest scale division on the apparatus



Temperature = 100 - 110°C

Imprecise



Temperature = 107°C

More precise

Musical measuring cylinders

Your teacher will set up 20 pieces of equipment (numbered 1-20) in the lab which all contain different volumes of liquid.

Write numbers 1 to 20 down the side of your page.

Stand next to a numbered measuring cylinder and wait for your teacher to play music.

While the music is playing you should look at the scale and write down what the volume measures.

Move on when the music stops

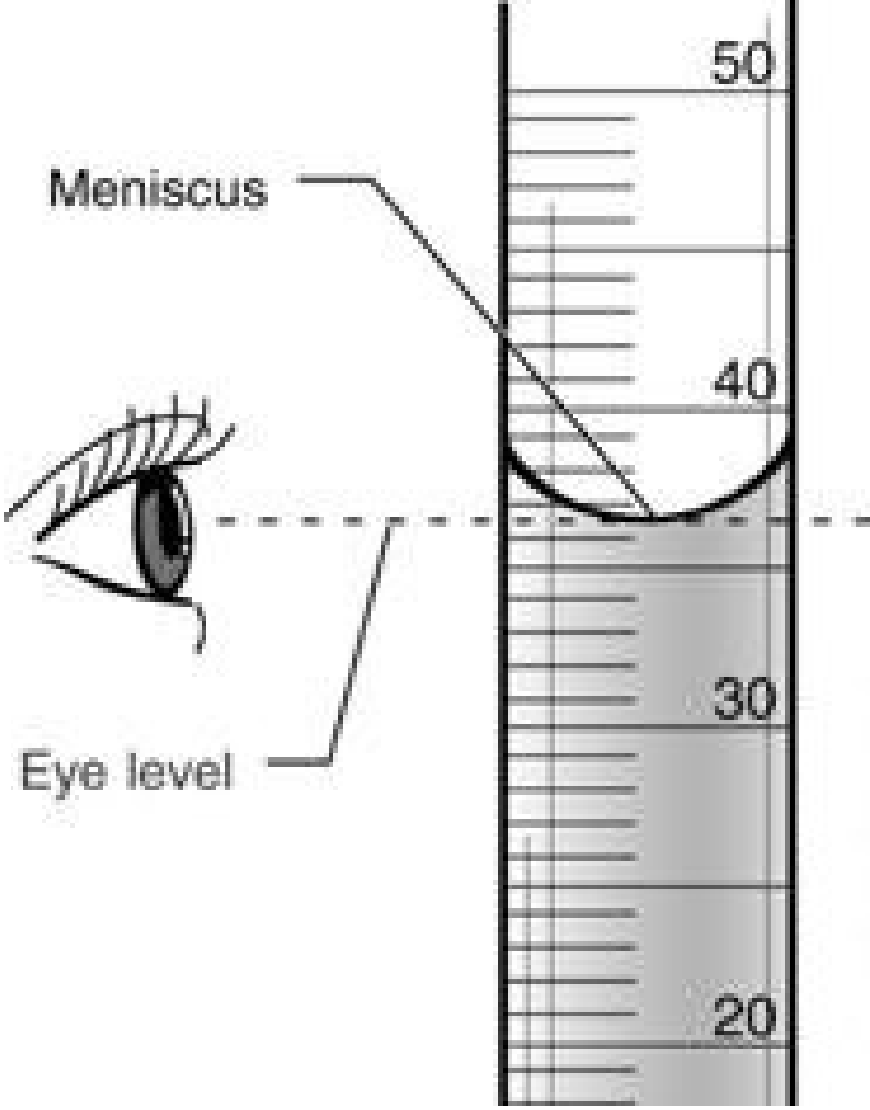
Using a measuring cylinder

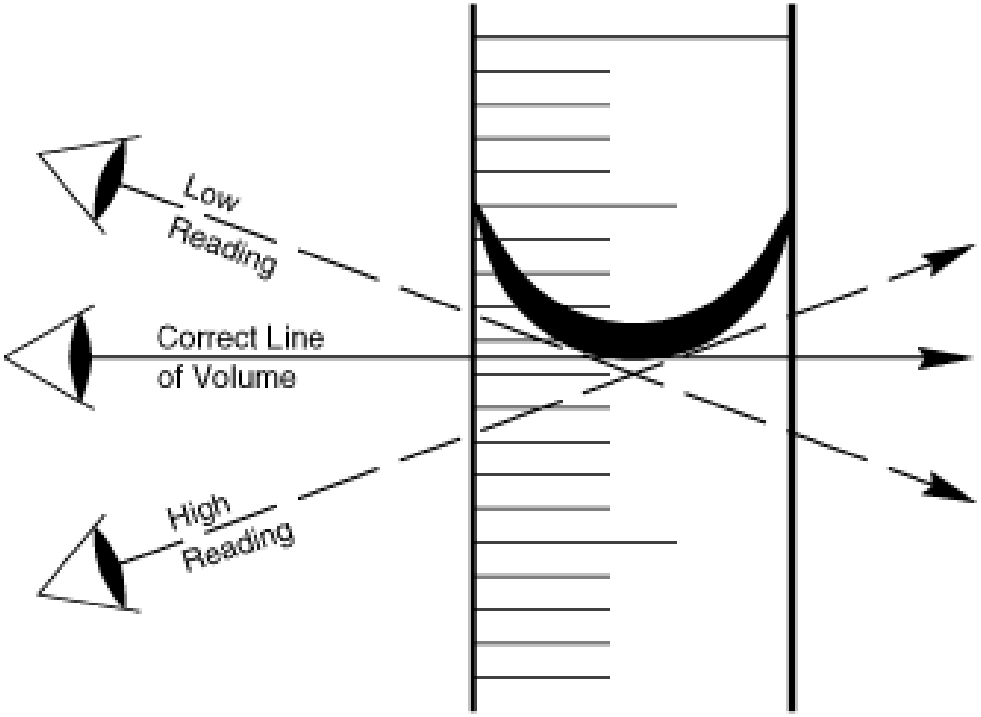
Measuring

Put 50 ml of water in your measuring cylinder

Put your hand up when you've done this.


8
6


50
40
30
20
Meniscus
Eye level

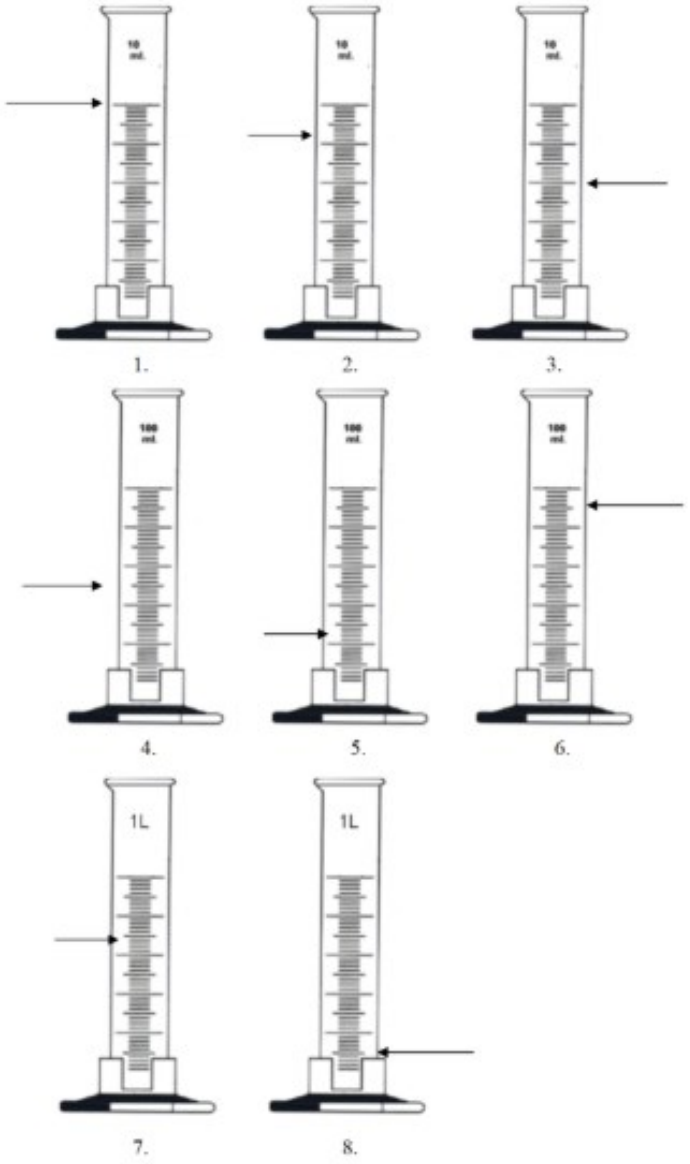

Low
Reading
Correct Line
of Volume
High
Reading

Homework

- Complete the sheet, your teacher will tell you if you can write on the sheet or just put the answers in your jotter in a table

Cylinder No.	Volume

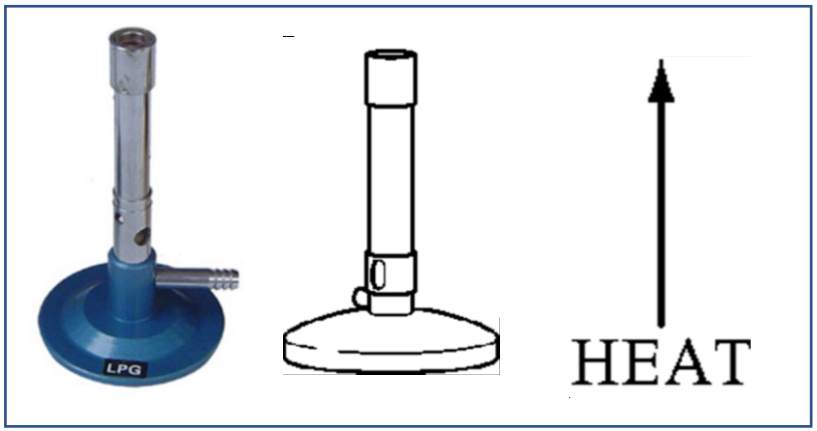
What readings are the arrows pointing to?
(LOOK CAREFULLY AT THE SIZE OF THE MEASURING CYLINDER)



Drawing Equipment in Science

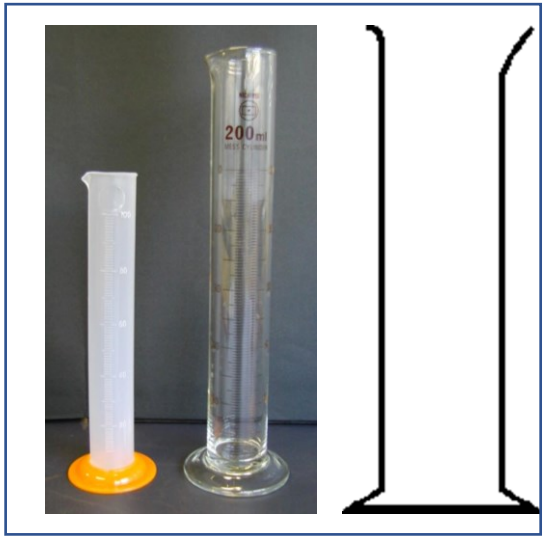
In science we draw in 2 Dimensions.

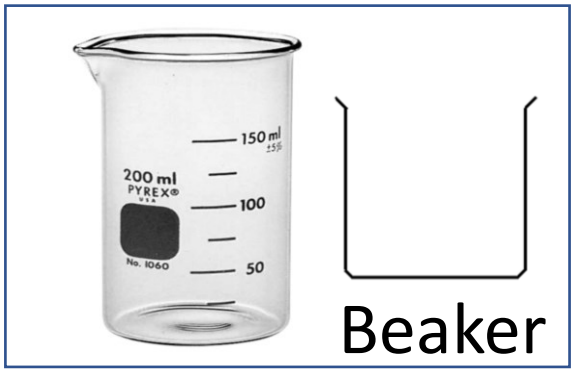
Look at the pictures of the lab equipment (on the next two slides). Can you find where they are kept in the lab?



Bunsen Burner

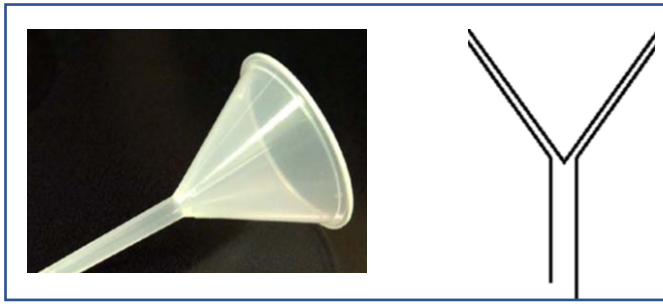
Measuring cylinder



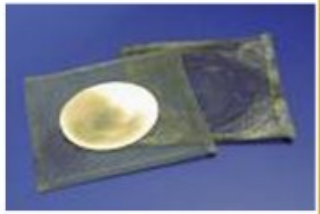


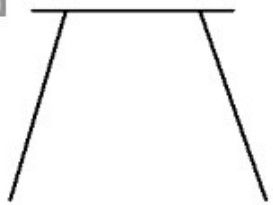
Beaker

Filter Paper and funnel



Tripod





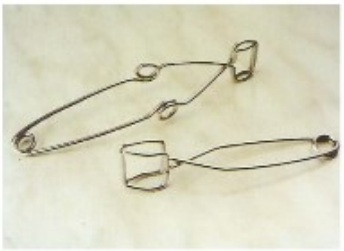
and gauze

Conical flask

Test tubes and

boiling tubes

Test tube racks

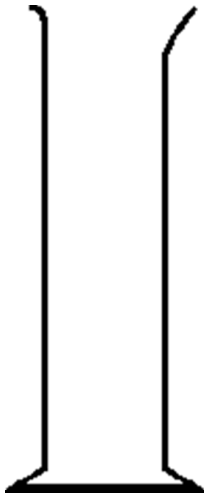


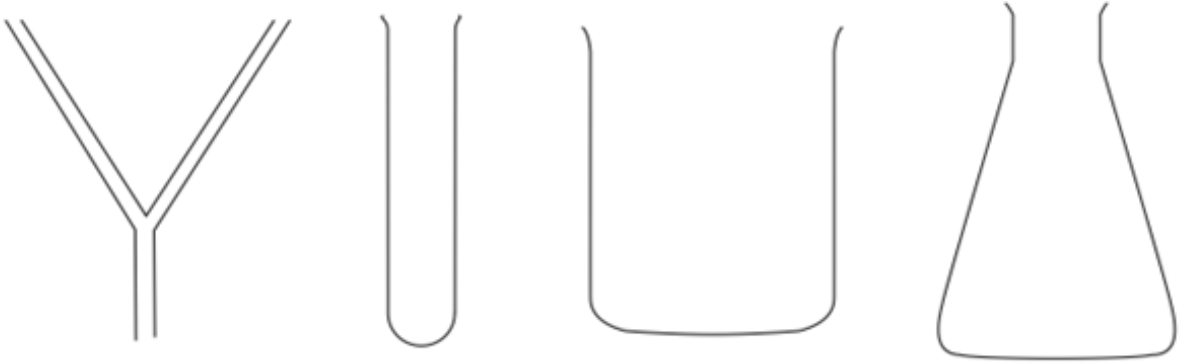
Test tube holder

- not necessary to draw these

Drawing Equipment

label it too





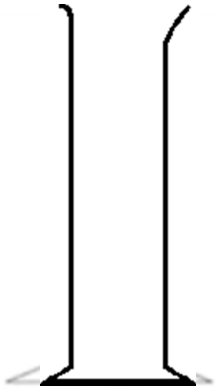
Heat

Filter funnel

Test tube

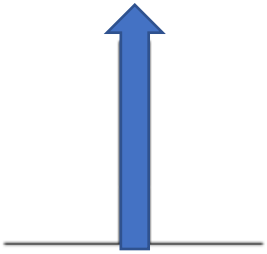
Beaker

Conical flask



Measuring cylinder

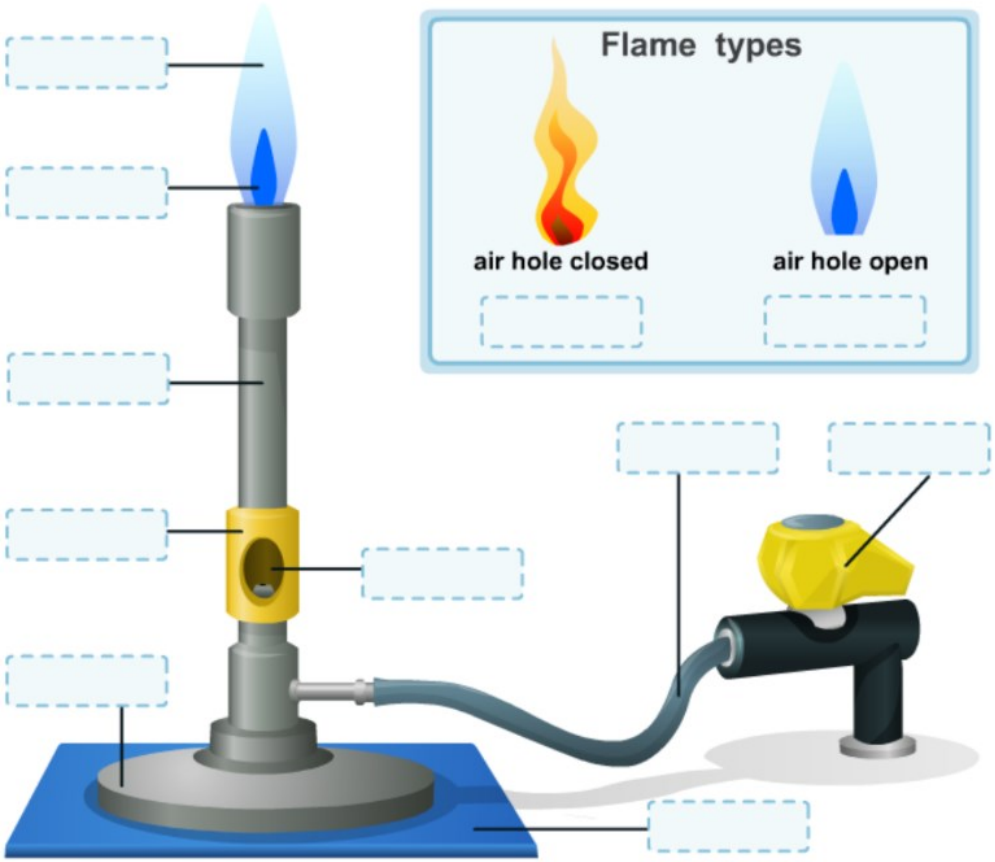
Tripod



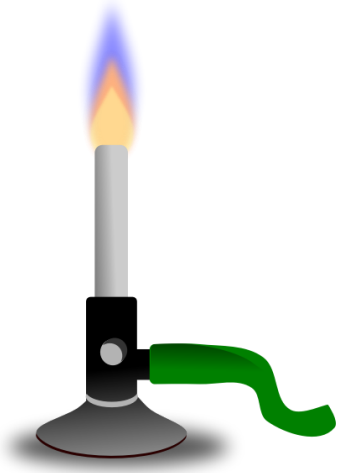
Heat

Bunsen burner

The Bunsen Burner



Safety
When using the Bunsen Burners always wear goggles and have long hair tied back.



Equipment handling

To Use:
1. air hole nearly closed to light flame
2. gas tap on (pull up and turn it)
3. light the flame
4. air hole turned, open, to blue flame

When Finished:
1. Turn the air hole to close it (getting the yellow safety flame)
2. Turn off the gas, using the tap

Lighting a Bunsen

wordbank

blue

open

closed

- When lighting a Bunsen you must first make sure the hole is _____. This will give the Bunsen a yellow flame. When heating water you must _____ the hole to let more air in so that the flame turns from yellow to _____. Blue is the hottest flame.

Questions

1. When the air hole is nearly closed, what colour is the flame? yellow

2. When is the flame the hottest, yellow or blue? blue

3. When the air hole is open, what colour is the flame? blue

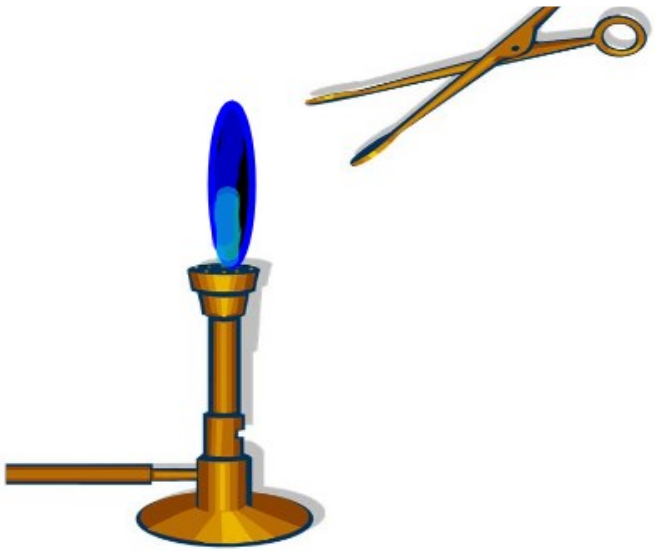
4. Which part of the flame is hottest? Just above the cone

5. To be safe when using Bunsen burners what should you always do / wear? Tie hair back, wear goggles, never leave it unattended.

Bunsen Burner - Experiment 1

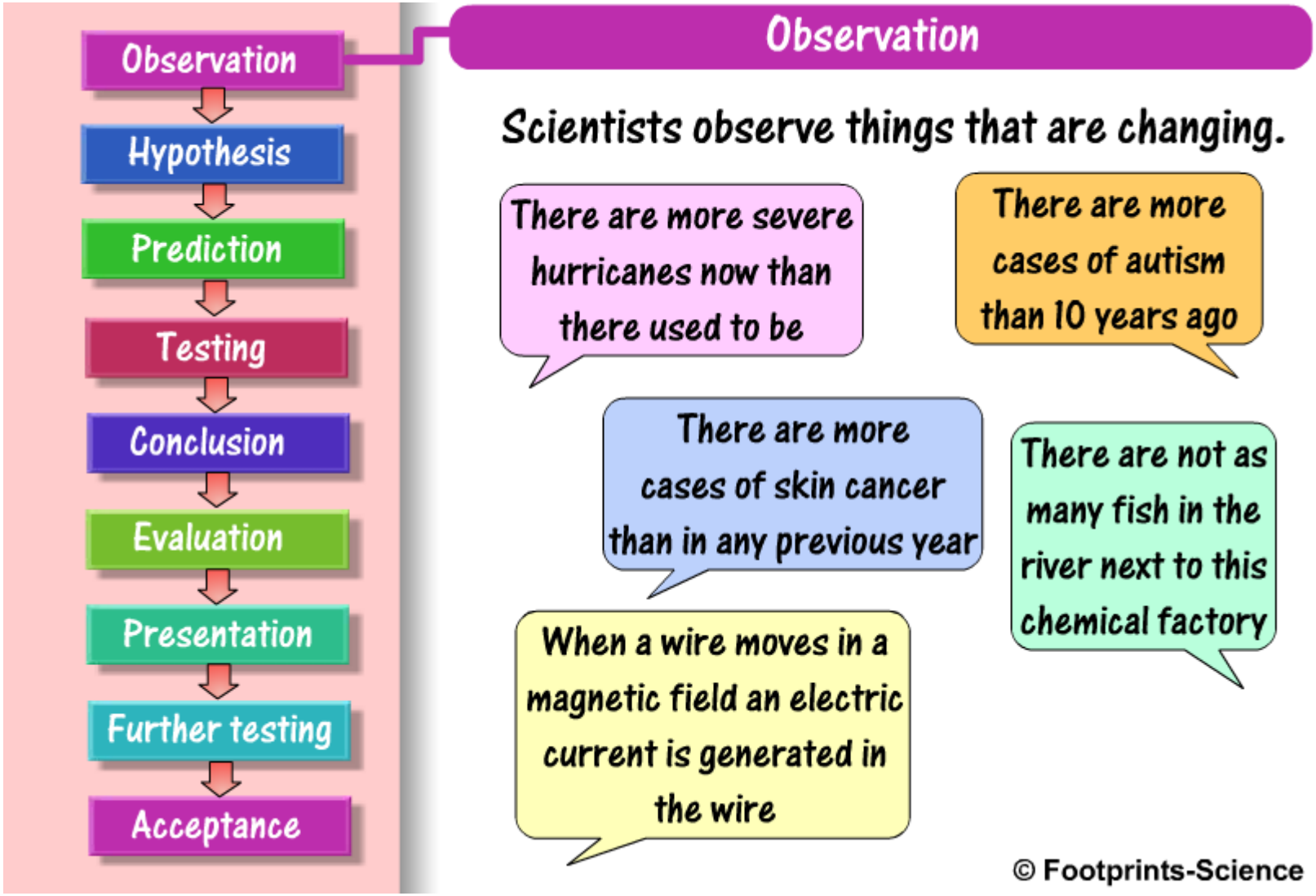
1. Collect a piece of magnesium ribbon from your teacher

Safety
Wear safety goggles, tie hair back and don't look directly at the flame!



4. What happens during the experiment?

How Science Works



Variables

Variables are things that vary and change

Variables

In any experiment there are 3 variables:

- an independent (or input) variable
- a dependent (or outcome) variable
- some control variables

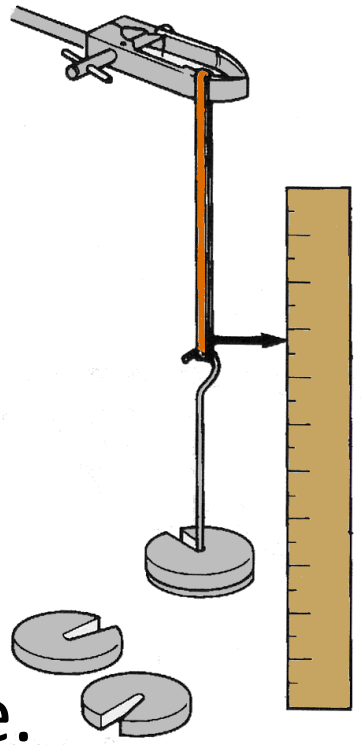
Let's look at each type….

Independent (input) variable

This is the thing that you decide to change.

Example 1

Investigating how a weight
affects the length of an elastic band.



You decide the weight to apply,
so:

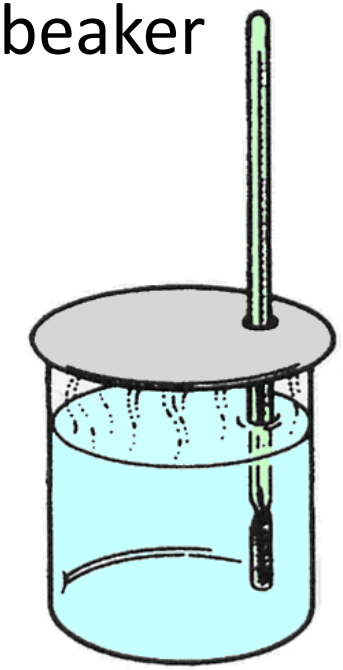
Weight is the independent variable.

Independent (input) variable

This is the thing that you decide to change.

Example 2

Investigating how the rate of cooling of a beaker depends on the initial temperature.



You decide the initial temperature, so:

initial temperature is the independent variable.

Independent (input) variable

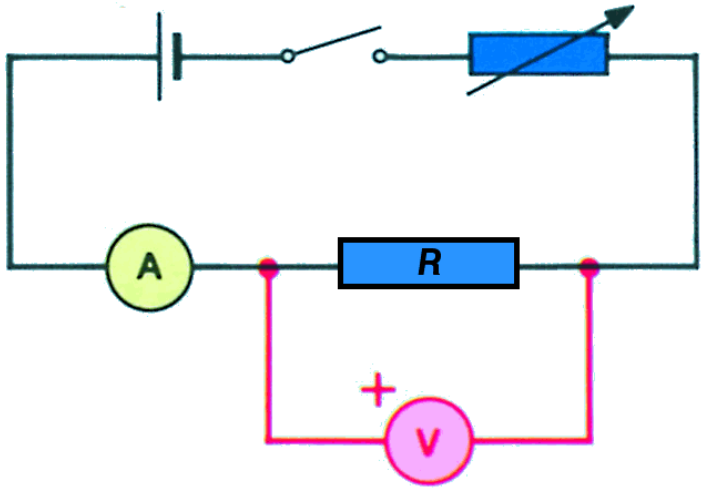
This is the thing that you decide to change.

Example 3

Investigating how the current through a resistor depends on the voltage across it.

Which is the independent variable here?

The voltage is the independent variable.

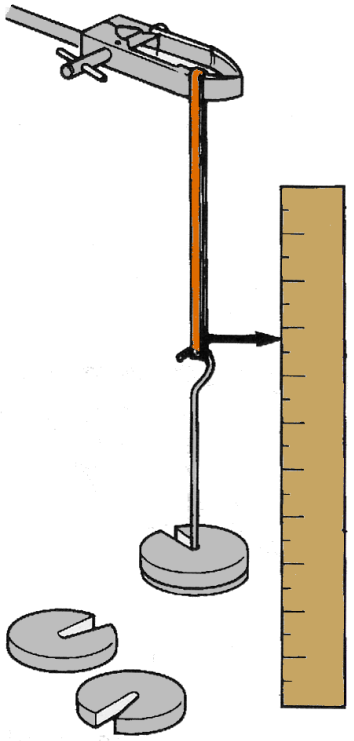


Dependent (outcome) variable

This is the variable that changes as a result.
It is the variable that you measure.

Example 1

Investigating how a weight
affects the length of an elastic band.



You measure the resulting length
of the elastic band, so:

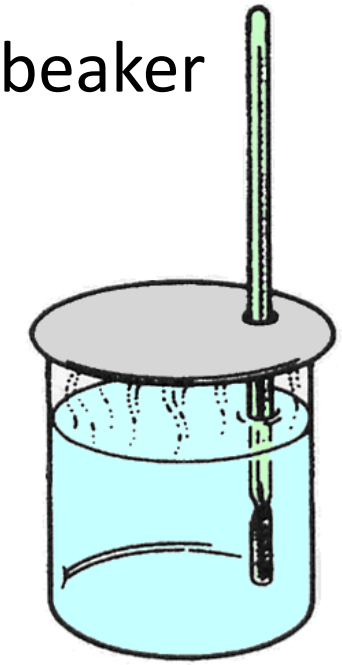
Length is the dependent variable.

Dependent (outcome) variable

This is the variable that changes as a result.
It is the variable that you measure.

Example 2

Investigating how the rate of cooling of a beaker depends on the initial temperature.



You measure the temperature as it cools, so:

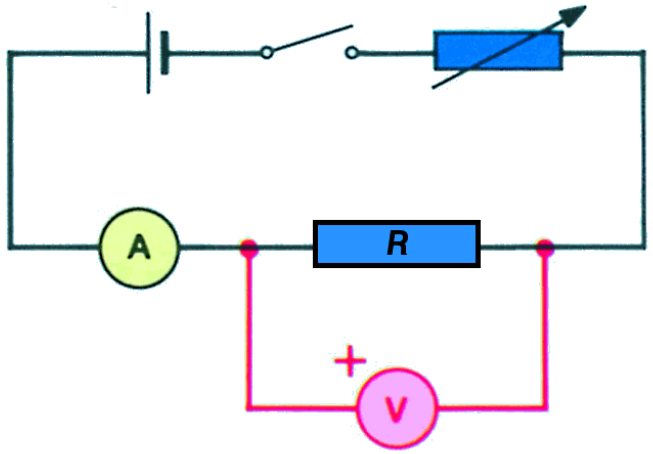
temperature is the dependent variable.

Dependent (outcome) variable

This is the variable that changes as a result.
It is the variable that you measure.

Example 3

Investigating how the current through a resistor depends on the voltage across it.



Which is the dependent variable here?

The current is the dependent variable.

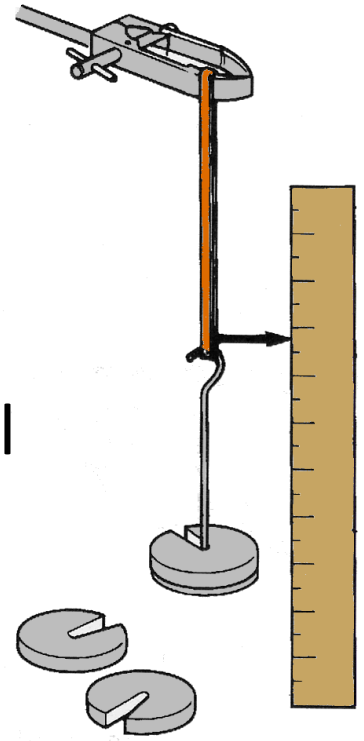
Control variables

These are all the variables that must not change, to make sure it is a fair test.

Example 1

Investigating how a weight
affects the length of an elastic band.

You must use the same elastic band all the time,
and the same scale etc,
so it is a fair test.

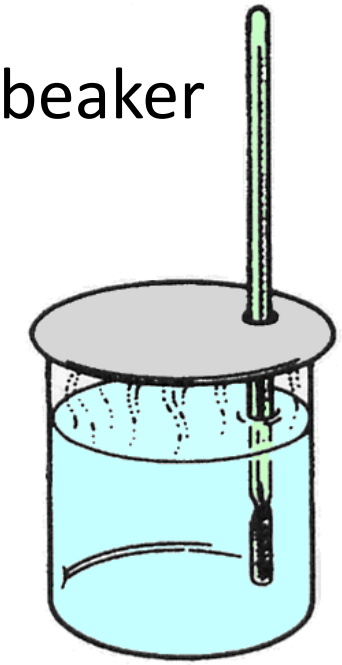


Control variables

These are all the variables that must not change, to make sure it is a fair test.

Example 2

Investigating how the rate of cooling of a beaker depends on the initial temperature.



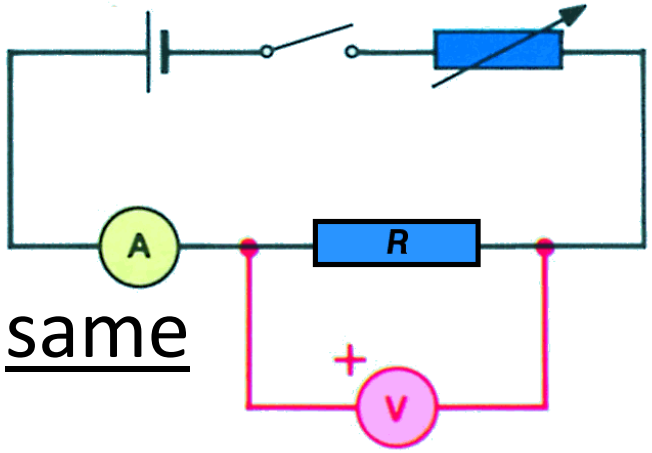
You must use the same beaker,
with the same amount of water,
in the same position in the room,
at the same room temperature,
so it is a fair test.

Control variables

These are all the variables that must <u>not</u> change, to make sure it is a fair test.

Example 3

Investigating how the current through a resistor depends on the voltage across it.



Which are the control variables here?

Use the <u>same</u> circuit at the <u>same</u> temperature each time.

Tables

When you draw up a table of your results,

the independent variable goes in the first column, like this:

independent variable	dependent variable			
	1st reading	2nd reading	3rd reading	Mean (average)

If you take several readings of the dependent variable, then you can calculate the mean (average)

Then your results will be more reliable.

In Summary

Example 1

The independent variable is

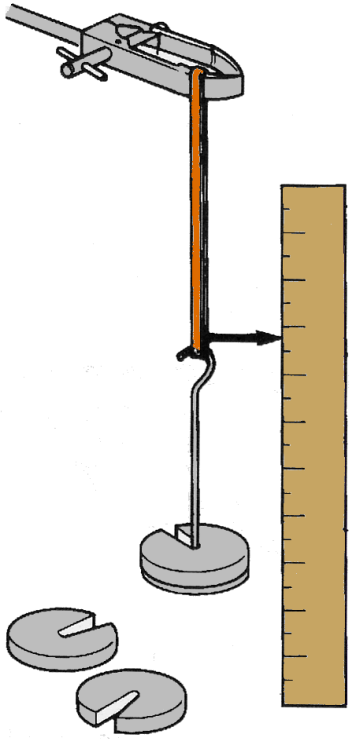
- weight

The dependent variable is

- length of the elastic

The control variables are

same elastic band,
same scale, etc,
so it is a fair test.



In Summary

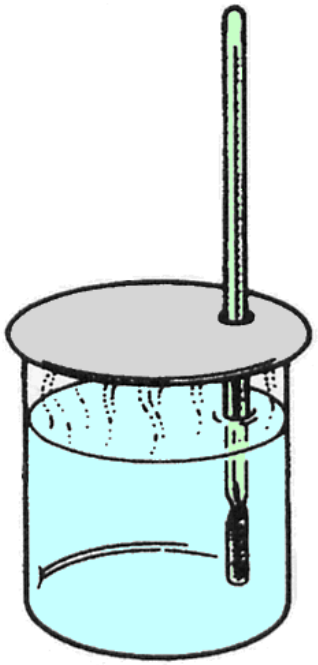
Example 2

The independent variable is

- initial temperature

The dependent variable is

- temperature as it cools



The control variables are

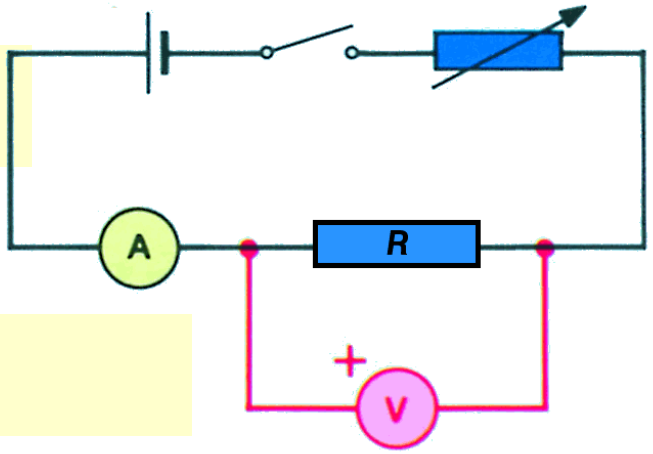
the same beaker,
with the same amount of water,
in the same position in the room,
at the same room temperature,
so it is a fair test.

In Summary

Example 3

The independent variable is

- voltage (p.d.)



The dependent variable is

- current

The control variables are

the same circuit,
at the same temperature each time,
so it is a fair test.


What do you think we are talking about today?

Northern Territory Government

The Risk Management Process

Definitions

What is a hazard?

Something that has the potential to cause harm to people, property or the environment.

What is a risk?

A 'risk' is the chance or probability of that hazard causing harm or damage to people, property or the environment.

What is a control?

A control is a mechanism or process that minimises the risk of the hazard becoming actual so protects people, property or the environment from the identified hazard.

Name the

1.Hazard

2.Risk

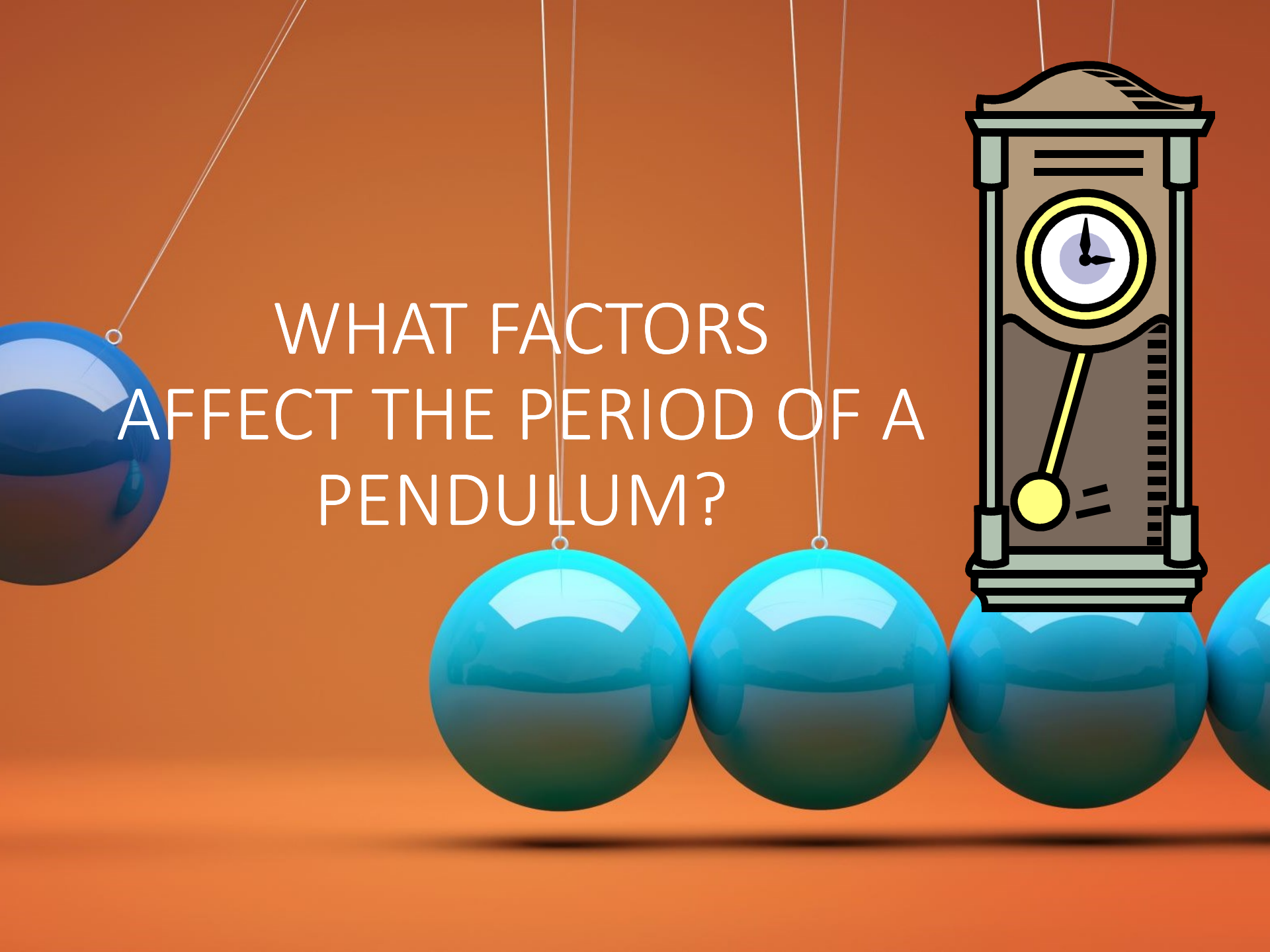
3.control

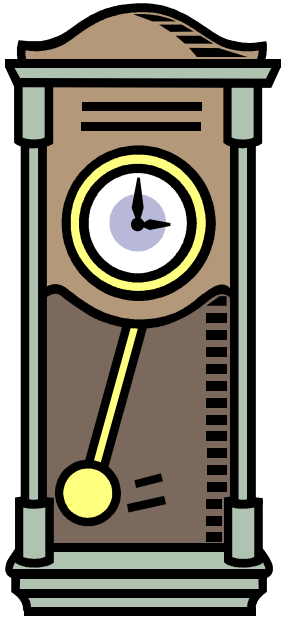
Name the
1.Hazard
2.Risk
3.control

G

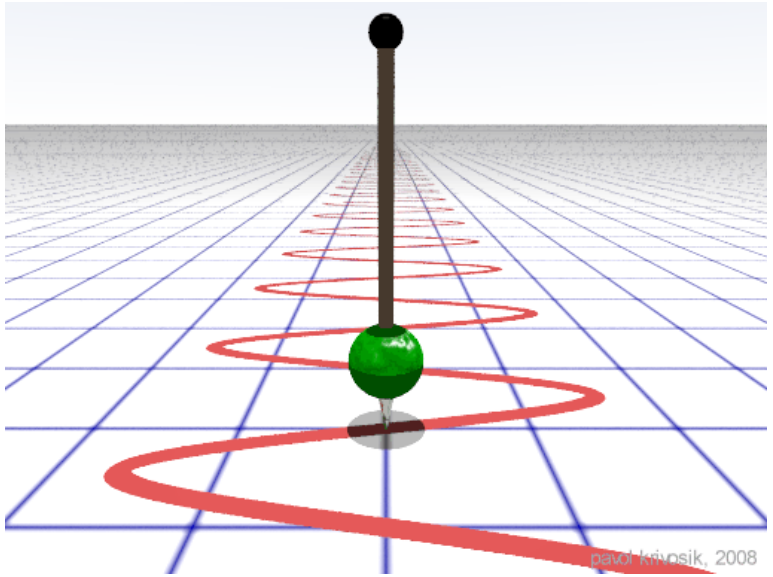
IN

WHAT FACTORS AFFECT THE PERIOD OF A PENDULUM?





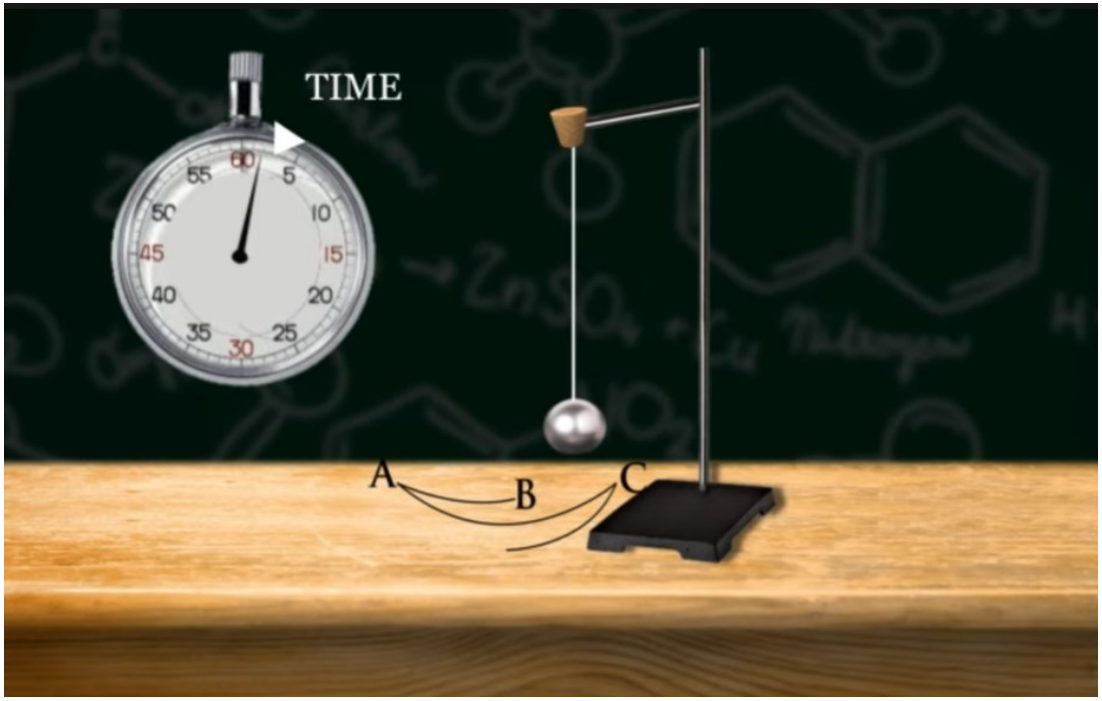
A Pendulum is….



Something that swings back and forth

Risk Assessment

For the pendulum experiment, think about the following



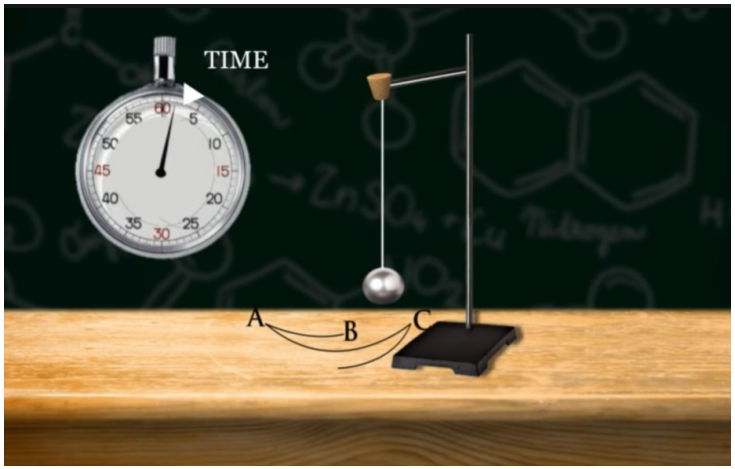
What are the HAZARDS?
What are the RISKS?
What are your CONTROL MEASURES?

What are the HAZARDS? Pendulum bob, retort stand. (can you identify anything else?)

What are the RISKS? Pendulum bob, retort stand. (can you identify anything else?)

What are your CONTROL MEASURES?

Wear goggles, put something heavy on the retort stand so that it can't topple over, clear your area, give yourself enough space, stand to the side of the pendulum. Limit the swing, don't push the pendulum.



Q1 What affects the time for one swing of a pendulum?

Length of the pendulum

Angle of the swing

Mass on the end

With your teacher's help choose an investigation to do (pick one of the ones above)

Q2 What is the aim of your experiment?
OR What do you hope to find out?

To find out if the….

Length of the pendulum

Angle of the swing

Mass on the end

affects the

(copy the rest of the TITLE from affects).

Q3 What will you expect to happen?

As the (your answer to Q1)

increases

the (rest of the title from affects……..

Increases/ or decreases
(choose one of these words)

Q4. What two things will you measure?

What equipment will you use to measure these two things?

State HOW you will change your variable

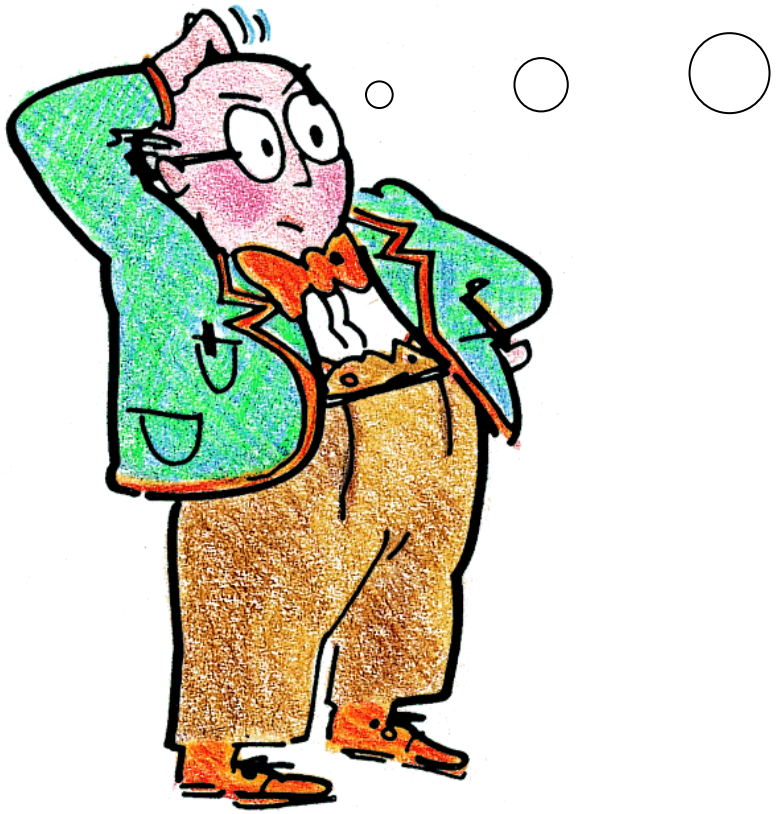
Draw a diagram of your apparatus

Q5. What variable will you change?

HOW WILL YOU CHANGE YOUR VARIABLE?

Look at the list in question 1 to help you!

Q6 What variables (things) will you keep the same?



Use Q1 to help you

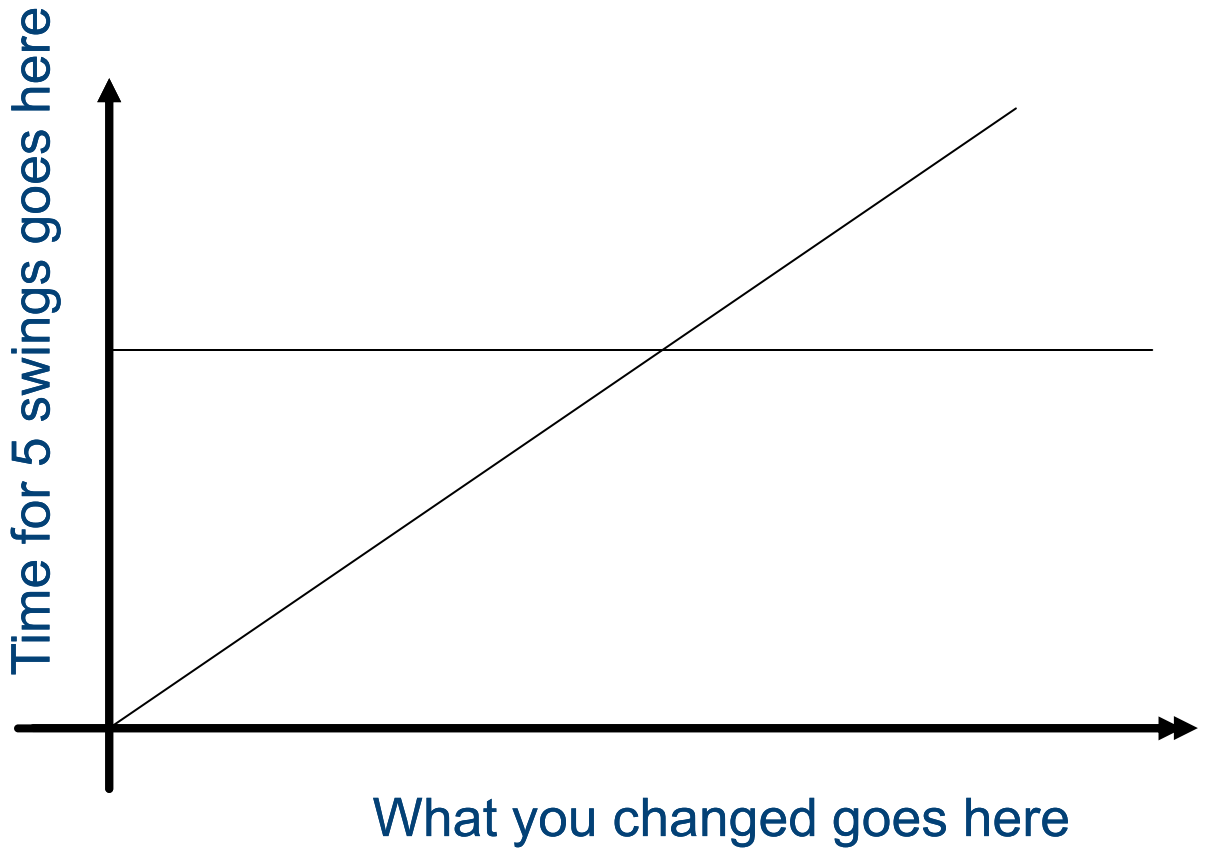
Q7 Draw out a table of your results

What you change goes in here!	What else you measure goes here (and units) 1	2	3	Average of last column (don't forget units)

Do you know what to do?

- If YES then get on
- If NO put your hand up for help!

Plot a graph of your variable against time



Conclusion:
WHAT DID YOU FIND OUT?

As the -------- increases,
The time for one swing ---

Write up what you did carefully?

Include

1. A labelled diagram,
2. How you changed your independent variable
3. What you measured
4. What equipment did you use to measure with
5. What you kept the same
6. How you kept it a fair test