



Homework	Due Date	Award
1 (Pg 4-5)		
2 (Pg 6-7)		
3 (Pg 8-9)		
4 (Pg 10)		
5 (Pg 11-12)		



# Stonelaw High School

## Science Faculty

### BGE Science

### Science 101

### Homework Booklet



Name: \_\_\_\_\_

Class: \_\_\_\_\_

## Success Criteria

- ✓ I am confident that I understand this and can apply this to problems
- ? I have some understanding but I need to revise this some more
- ✗ I do not understand this and I need help with it

I will be successful if I can...		How well can you do this?
3 <sup>rd</sup>	Identify the structures found in an animal cell	✓ ? x
3 <sup>rd</sup>	Describe the function of the structures found in an animal cell	✓ ? x
3 <sup>rd</sup>	Identify the structures found in plant cell	✓ ? x
3 <sup>rd</sup>	Describe the function of the structures found in a plant cell	✓ ? x
3 <sup>rd</sup>	Describe the main similarities and differences between plant and animal cells	✓ ? x
2 <sup>nd</sup>	Identify common forms of energy	✓ ? x
2 <sup>nd</sup>	Describe the law of conservation of energy	✓ ? x
2 <sup>nd</sup>	Give examples of everyday energy transformations	✓ ? x
2 <sup>nd</sup>	Identify 'useful' energy and 'wasted' energy in energy transformations	✓ ? x
3 <sup>rd</sup>	Describe the properties of metals and non-metals	✓ ? x
3 <sup>rd</sup>	Describe how elements are organised in the Periodic Table	✓ ? x
3 <sup>rd</sup>	Identify the alkali metals, halogens and noble gases on the Periodic Table and describe their reactivity	✓ ? x

## Research Task

*You are going to research a Scottish Scientist*

**Our scientist**

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### Task Outline

<i>Task</i>	<i>Notes</i>

1. Read the scenario below then answer the following questions.

A student is carrying on in the science lab and knocks over a beaker. The glass beaker smashes, and a chemical is split onto the floor.

(a) If you were this student's lab partner what should you do?

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(b) The bottle the chemical came from had the following symbol on it.



(i) Identify the symbol on the bottle.

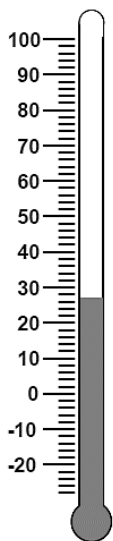
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(ii) Suggest a precaution which the student should consider when cleaning up the spillage.

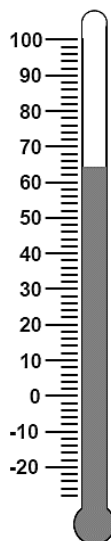
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2. (a) Thermometers are used to measure temperature. Complete the diagrams by stating the temperature on each thermometer.

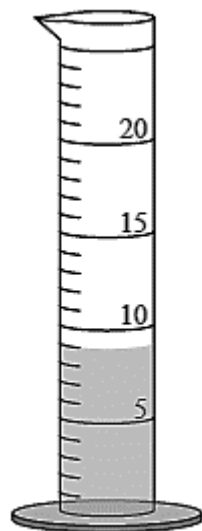


\_\_\_\_\_ °C

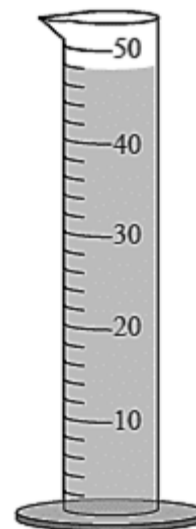


\_\_\_\_\_ °C

(b) The apparatus shown is used to measure the volume of a liquid in science.



\_\_\_\_\_ ml



\_\_\_\_\_ ml

- (i) Complete the diagram by stating the volume of water in each container.
- (ii) Name the apparatus shown

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1. In an experiment, scientists can alter variables to investigate different factors.

For a fair experiment, scientists should only change one variable at a time. This is the independent variable. The variable that is observed / measured is the dependent variable and all the other variables which are kept the same are the controlled variables.

- (a) An experiment was carried out to find out if the size of an object affected the time it took to fall to the floor.

Decide which variable is the independent variable, which is the dependent variable and which variables should be controlled by (✓)the correct column.

<i>Variable</i>	<i>Independent</i>	<i>Dependent</i>	<i>Controlled</i>
Height the ball was dropped from			
Size of the object			
Time it took for the object to fall to the floor			
Mass of the object (how heavy the object was)			

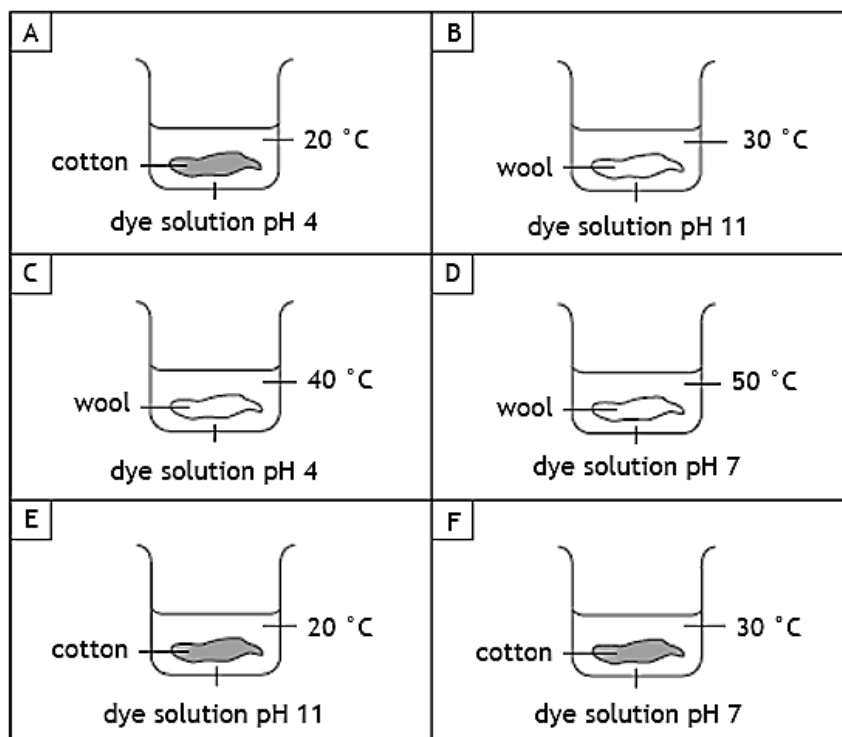
- (b) An experiment was carried out to find out if the colour of water a flower is grown in effects the colour of the flower.

Five white roses were placed into 5 separate beakers each containing a different colour of water. The beakers were then placed on a windowsill and the colour of the flowers monitored twice a day for two weeks.

Decide which variable is the independent variable, which is the dependent variable and which variables should be controlled by (✓)the correct column.

<i>Variable</i>	<i>Independent</i>	<i>Dependent</i>	<i>Controlled</i>
Colour of the roses			
Temperature			
Type of flower			
Colour of the water			
Size of the roses			

2. A student set up six experiments to investigate different factors which might affect the dyeing of cloths.



- (a) Identify which two experiments they should compare to show the effect of **pH** on the dyeing of cloth.

\_\_\_\_\_ and \_\_\_\_\_

- (b) The student wanted to use experiment D and experiment F to find out the effect of **temperature** on the dyeing of cloth.

- (i) Identify the variables that have been altered between experiment D and F.

\_\_\_\_\_

- (ii) Explain why the student cannot use Experiment D and F to investigate the effect of temperature.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

1. Read the following passage and answer the questions based on it.

**Robert Hooke (born 1635 - died 1703)**

Robert Hooke was a scientific genius. His interests included physics, astronomy, chemistry and biology.

Hooke's special contribution to biology was the invention of the many-lensed compound microscope (Figure 1). With it, Hooke observed a huge variety of organisms in great detail. He used his artistic skills to draw what he saw in his book *Micrographia*, which was published in 1665.



Figure 1

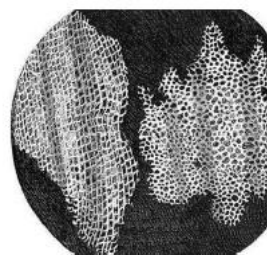


Figure 2

Probably Hooke's most famous microscopic observation was his study of thin slices of cork (Figure 2). He wrote "I could plainly see it to be all perforated and porous, much like a honeycomb, but that the pores were not regular. These microscopic pores or cells were indeed the first I ever saw, and perhaps, that were ever seen." Hooke had discovered plant cells. In fact it was Hooke who decided to call them "cells". He also reported seeing similar structures in other plants.

Hooke's microscope was a great improvement on Antony van Leeuwenhoek's single-lensed microscope. In 1678, van Leeuwenhoek wrote to the Royal Society to report his discovery of "little animals". He said "They were so small that I judged that if 100 of these were laid end to end they would reach the length of a millimetre." Hooke was asked by the Society to confirm van Leeuwenhoek's findings and did so successfully. As a result, Hooke became the founder of the study of cell biology and microbiology.

- (a) State the year Robert Hooke published his book, *Micrographia*.

\_\_\_\_\_

- (b) Name the type of microscope which was invented by Robert Hooke.

\_\_\_\_\_

- (c) State the name Robert Hooke gave to the 'pores' he viewed using his microscope.

\_\_\_\_\_

- (d) Name the two branches of biology which Robert Hooke became the founder of.

\_\_\_\_\_ and \_\_\_\_\_



- (e) Robert Hooke estimated that 100 cells would be the length of a millimetre.  
Calculate the average length of one cell.  
*Space for calculation*

\_\_\_\_\_ mm

2. The following table contains statements about cells.

Decide if each of the following statements about cells is **true** or **false** and tick (✓) the appropriate box.

If the statement is **false**, write the correct word in the **correction** box to replace the word underlined in the statement.

<i>Statement</i>	<i>True</i>	<i>False</i>	<i>Correction</i>
Animal and plant cells both have a cell <u>wall</u>			
The <u>vacuole</u> contains cell sap			
The <u>cytoplasm</u> controls the cell			

3. The list shows some parts of cells and their sizes.

Cell membrane 0.00001 mm thick	Chloroplast 0.005 mm thick	Nucleus 0.004 mm thick
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- (a) Write down the order in which you think these parts were discovered starting with the one which was discovered first.

1<sup>st</sup> \_\_\_\_\_

2<sup>nd</sup> \_\_\_\_\_

3<sup>rd</sup> \_\_\_\_\_

- (b) How did you decide this order?

\_\_\_\_\_

\_\_\_\_\_

1. Look at the picture of Bonfire Night.



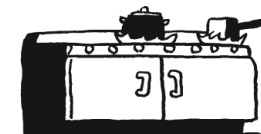
(a) Use the picture to identify one example of each form of energy in the table below.

A store of chemical energy	A transfer of energy by light	A transfer of energy by sound	A transfer of energy by heat

(b) Heat energy is given out in a number of the examples above, however it is not always a useful energy transfer. Give the example from above that transfers heat a useful energy output.

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2. The diagram shows a gas cooker.



The natural gas in this cooker transfers 200 kJ of stored energy to boil the water in the pan. When the water is boiling there is 168 kJ of thermal energy stored in the hot water.

(a) Calculate how much **wasted** energy has been transferred.  
*Space for calculation*

\_\_\_\_\_ kJ

(b) Explain your answer to (a).

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(c) Where is this wasted energy transferred?

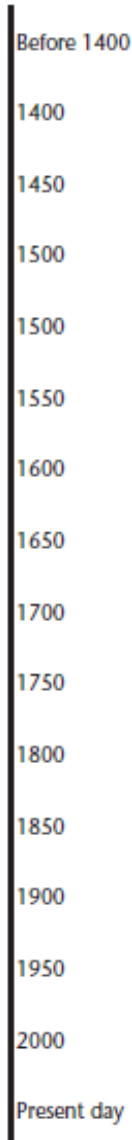
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**Homework 5**

**GOLD SILVER BRONZE**

1. The elements in the table are shown in alphabetical order.

<i>Name of element</i>	<i>Date of discovery</i>
Aluminium	1825
Arsenic	1649
Calcium	1808
Einsteinium	1952
Cobalt	1735
Helium	1895
Oxygen	1774
Zinc	1480



- (a) Mark each element on the timeline to show when it was discovered.
- (b) The electric battery was invented in 1799. Mark this date on your timeline.
- (c) Suggest the names of two elements that were discovered using the battery.

1 \_\_\_\_\_

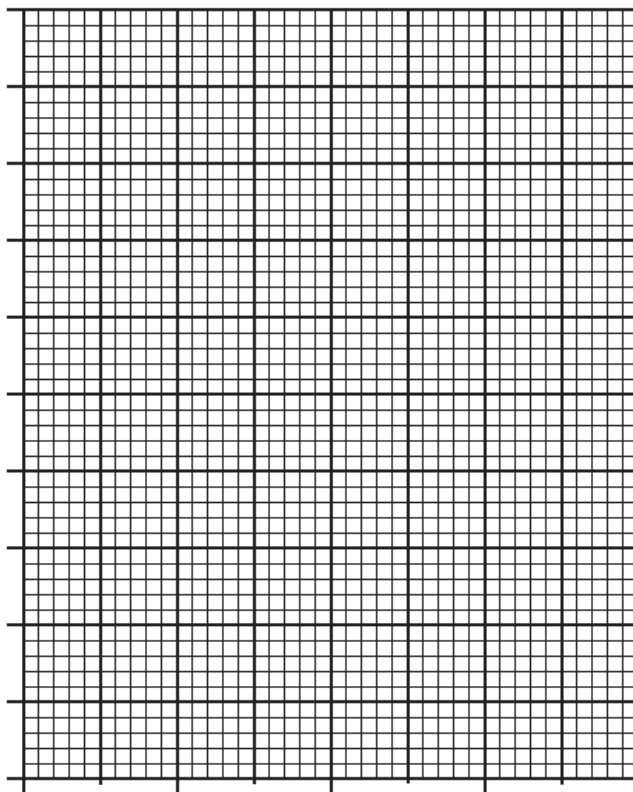
2 \_\_\_\_\_

2. Every element has an atomic number.

The name and atomic number of some elements are given in the table below.

<i>Element</i>	<i>Symbol</i>	<i>Atomic number</i>
Beryllium		4
Magnesium		12
Calcium		20
Strontium		38

- (a) Complete the table above by adding in the symbol for each element.
- (b) Present the information in the table as bar graph on the grid below by
- (i) Completing the horizontal axis
  - (ii) Completing the vertical axis
  - (iii) Drawing the bars



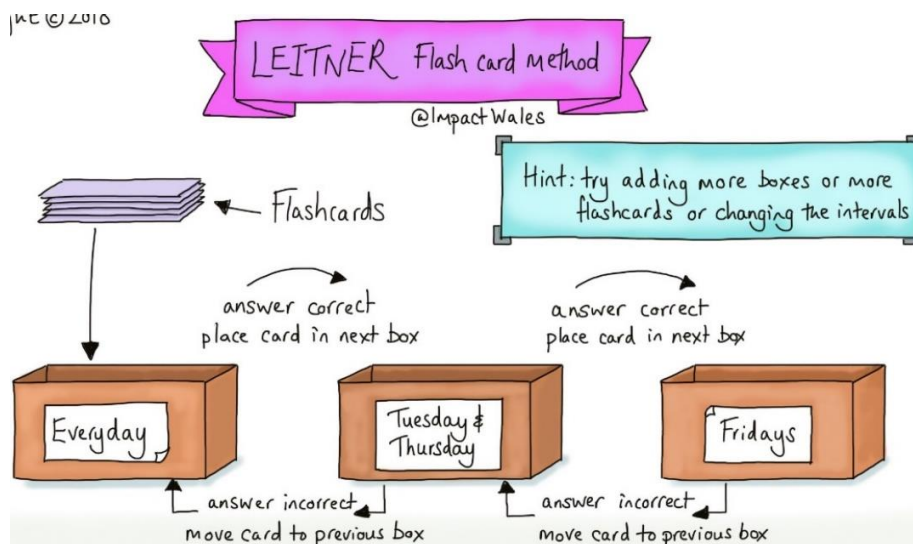
**Element Symbol**

## Study Skills

Revising for a test is important as it will help you feel more confident and ready for your assessment. One way to revise is to make a mind map using your success criteria. Complete the mind map on the back page to help identify what you have learned from this topic and what you might need to revise more.

Another good way to study is to make flash cards.

Write your success criteria on one side of an index card and then put the answer on the other side. You can use them to test yourself or give them to someone else to test your knowledge!



Quizlet is great to revise! You can download the app on your phone and sign up to the Stonelaw BGE Science group or scan the QR code below to take you straight to the set.



**SCAN ME**

Quizlet has different activities to help you learn!

- Flashcards help you learn the material you need for your assessment.
- Learn mode tests your knowledge by asking you to match each term with the correct description.
- Spell mode is great to hear the scientific words that will be new to you. Listen to the word and then type what you hear.
- Test mode is a mixture of matching and multiple choice to really see what you know!
- Gravity and match are games you can play and gain points to move up a leader board!

