

# Home Learning Tasks



Your home learning tasks have been split into four main sections. It is entirely up to you in which order you complete these. They are designed to revisit some of the key Scientific skills you have used in your lessons this year. This means that some of the experiments you are asked to work on may be unfamiliar – Please don't be put off by this as we are looking for the skills.

If you can, we would like you to send any completed work to us through Show My Homework. Please don't worry if you can't; keep hold of it until we return to school.

Science in Action	Application of Science	Recall of knowledge: Choose 1	Widening Your Scientific Mind
<p>We want you to get creative for this section! We will provide you with a method for an experiment you can complete at home. Use the planning sheets to record what you did and what you found out.</p> <p>If you want a real challenge, you could design your own investigation altogether! Use the blank planning sheet to help you structure your ideas.</p>	<p>For this task, you will have to read information around a key area of Science. This is where we are looking for you to develop your Scientific skills and will be given a list of criteria for the work that you produce.</p>	<p><b>Option One:</b> An Educake quiz will be set over the 3 weeks for you to complete. Decide how many you think you need to get right – 50%? 75%? 100%?</p> <p><b>Or</b></p> <p><b>Option Two:</b> Read a method for an investigation you may or may not have completed.</p>	<p>These tasks will help to understand the Science in the real world. We would like you to watch, read or discover some new Science and will provide you with some stimulus material to look at.</p> <p>You will be given <b>two</b> options and you we'd like you to complete at least <b>one</b>.</p>

**For Years 8 and 9 - Wb 13<sup>th</sup>, 20<sup>th</sup> and 27<sup>th</sup> April**

## Section One – Science in Action

### Viscosity of a Liquid – How runny is a liquid?

Viscous liquids aren't runny.

Treacle is more viscous than Water.

You will choose 3 liquids to compare.

Find a surface to run the liquid down. Decide how you will tell which is the runniest.

Name

Class

**I Changed (Independent Variable):**

**I measured (Dependent Variable):**

**I did this using:**

**I kept the following the same (Controlled Variable):**

**This was important because:**

**Diagram of equipment set up.**

**What I did – Simple steps (Method):**

Carry out your experiment. Record your results in the table shown:

Choose 3 liquids to run down a surface

Raise the surface to the same angle for each run

Time how long each one takes to run the same distance

**Basic** – Carry out 1 run for 3 different liquids – keep distance and angle the same

**Intermediate** – Carry out 3 runs for each liquid – keep distance and angle the same – calculate the average by adding all 3 together then dividing the answer by 3

**Extension** – Carry out 3 runs for each liquid – Decide if there are any anomalies (results that look wrong) – calculate the average in each case, missing out the anomalies

Liquid	Time 1 / s	Time 2 / s	Time 3 / s	Average Time /s

**What I found out (Conclusion):**

**Explain how you know which was the most Viscous (least runny)**

## Section Two – Application of Science

# Investigating which type of insulation is the most effective

## Focus: Planning Skills

### Information

There are several different materials that can be used to insulate our homes. Insulating materials slow down the transfer of heat energy. This makes them very useful at saving energy in the home because the heating does not need to be kept on as long.

### Think about

Choose a good scientific question to test. Some of these are better than others.

- Which material is best to use for insulating the roof?
- Which material is best at insulating: card, paper or foam?
- Which material keeps a beaker of water at the highest temperature for the longest?

### Task

Plan an investigation to answer the question you have asked.

#### Your plan should include the following:

Title – *what question are you trying to answer?*

List of equipment

Step-by-step plan – *clear instructions of what you will do*

How I will make it a safe investigation – *hazards and precautions you will take*

How I will make the results accurate and reliable

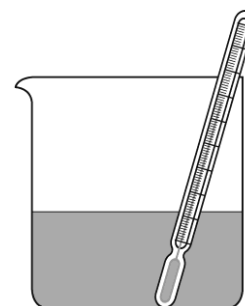
Prediction – *give a scientific reason for your prediction*

#### Writing for a purpose

Write in the future tense – e.g. *I will cover a beaker in insulation.*

Be as specific as you can, so someone else could do the experiment using your plan - e.g. *I will need 1 thermometer, 3 x 100cm<sup>3</sup> beakers, etc.*

Give a scientific reason for your prediction, using scientific words.



### Key words

dependent variable, independent variable, temperature, variable, volume  
energy transfer, heat energy, insulation, thermometer, time

## Section Three – Recall of Knowledge: Please choose one...

### Option One

Go to [www.educake.co.uk](http://www.educake.co.uk) and enter the username and password you were given. If it doesn't work and you are unable to reset it yourself, email [pschuller@stocksbridgehigh.co.uk](mailto:pschuller@stocksbridgehigh.co.uk) and you will be given instructions on what to do next.

1. Decide how many you think you need to get right before you start. Are you aiming for 50%, 75% or even 100%? If you don't reach your target first time, that's okay as you can retake the quiz as many times as you like.
2. If you don't agree with the way that Educake has marked your answer, you can disagree with the mark. Pressing this will ask your teacher to check and decide whether your answer is indeed correct or whether it still needs a little bit of work. Make sure you check back regularly to see whether you have received some feedback
3. If you want to set yourself a real challenge; you can set yourself your own quiz to complete. Try setting yourself 10 random questions from a topic you have covered this year. If you are unsure, email your Science teacher with your name and class and they will be able to help you out.



## Section Three – Recall of Knowledge: Please choose one...

### Option Two

#### Density of a Regular Object

Density is the mass per unit volume.

It is calculated by  $\text{density} = \text{mass} \div \text{volume}$

Dense objects have closely packed particles

This experiment is to compare the densities of the following blocks:



**Aluminium**



**Copper**



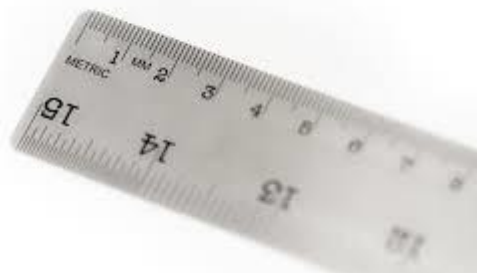
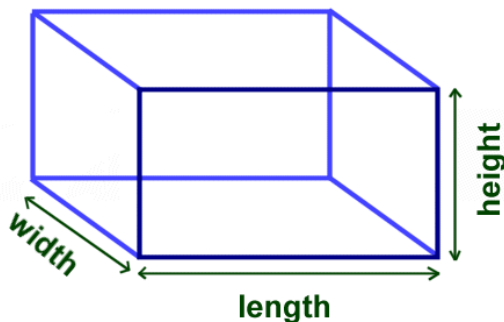
**Marble**

Finding the density of a regular shaped object such as a cuboid or cube

We need to find the mass and the volume of the object.

We find the mass in grams or kg by putting the object on a balance

To find the volume we use a ruler to measure the length, the width, and depth of the object



To find the volume, times these together:  $\text{length} \times \text{width} \times \text{height}$

The density can then be calculated by:  $\text{Density} = \text{Mass} \div \text{Volume}$

The values can then be compared.

**Independent variable** – what you are testing

**Dependent variable** – what changes

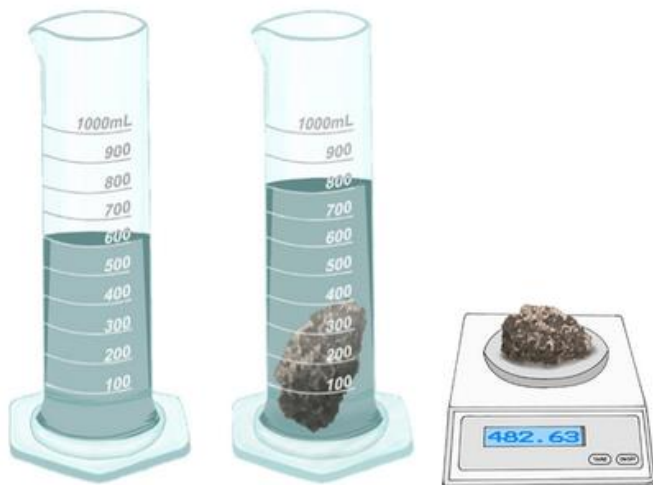
**Controlled variables** – things you keep the same to make sure only one variable is changed

**Range** – from highest to lowest

**Interval** – gap between each reading

**Resolution** – the smallest interval you can accurately measure

- 1) What is the independent variable in the experiment?
- 2) What measurements do you need to make? (there are 3)
- 3) What is the resolution of the ruler?
- 4) Describe how you will use the measurements you have taken to find the density of each block.
- 5) Can you think of how you could find the mass and volume of an object if you have some water and a measuring cylinder?



**6) Either**

Research Archimedes and the King's crown. Summarise how he used the ideas of density.

**Or**

EXTENSION: Someone has a block of metal. Explain how they could find out which metal it is.

*Every different material has a different density. These can be easily found in books or on the internet*

## Section Four – Widening your Scientific Mind

Your Tasks. Either:

1. Watch a Scientific program and produce a poster to summarise the key ideas. We have provided you with a list if you need some inspiration.

Or

2. Choose anything from your science lessons this year. Choose 5 key points, design a way to teach them to a member of your family then test them.

Some places to look for Scientific information as a starting point:

- <https://www.sciencenewsforstudents.org/>
- [https://www.bbc.co.uk/news/science\\_and\\_environment](https://www.bbc.co.uk/news/science_and_environment)
- <https://www.independent.co.uk/news/science>
- [https://www.youtube.com/channel/UCBX5er6E37\\_yWB3gCM32p3g](https://www.youtube.com/channel/UCBX5er6E37_yWB3gCM32p3g)
- [https://www.youtube.com/channel/UCqbOeHaAUXw9II7sBVG3\\_bw](https://www.youtube.com/channel/UCqbOeHaAUXw9II7sBVG3_bw)
- <https://www.youtube.com/channel/UCBgymal8AR4QIK2e0EfJwaA>

On the next page is a list of programs you could watch.



Where to watch	What to watch
BBC iPlayer	8 Days: To the moon and back All Aboard! The great reindeer migration The blue planet Blue planet 2 Dynasties (this is great) Earth from space People of science with professor Brain Cox The planets Serengeti Science of Doctor WHO Doctor WHO Seven wonders, One planet Life on Earth Life
Netflix – subscription required	Apollo 11 Walking with dinosaurs Frozen planet Mars NOVA: Black Hole Apocalypse The last man on the moon The search for life in space Nova death dive to Saturn
Movies - general	Interstellar The Martian Avatar Gravity Star wars – all Hidden Figures Gorillas in the Mist
Sky	Chernobyl Extraordinary powers of the human body Amazing plants Dinosaurs decoded
National Geographic	Wolves of Yellowstone What is nuclear energy? Misunderstood Microbes Black hole Genetics The Brain Life in extreme places
SIMA classroom – subscription required	Promise of gene therapy Open sourcing the brain Baseball in the time of Cholera Stories from the field: Bangladesh Climate Solver 2014 – Solar Turtle Protecting our atmosphere for generations to come Protecting Panama