

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>Option One: 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>Or</p> <p>Option Two: 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 two options and you we'd like you to complete at least one.</p> |

For Year 7 - Wb 4th, 11th and 18th May

Section One – Science in Action

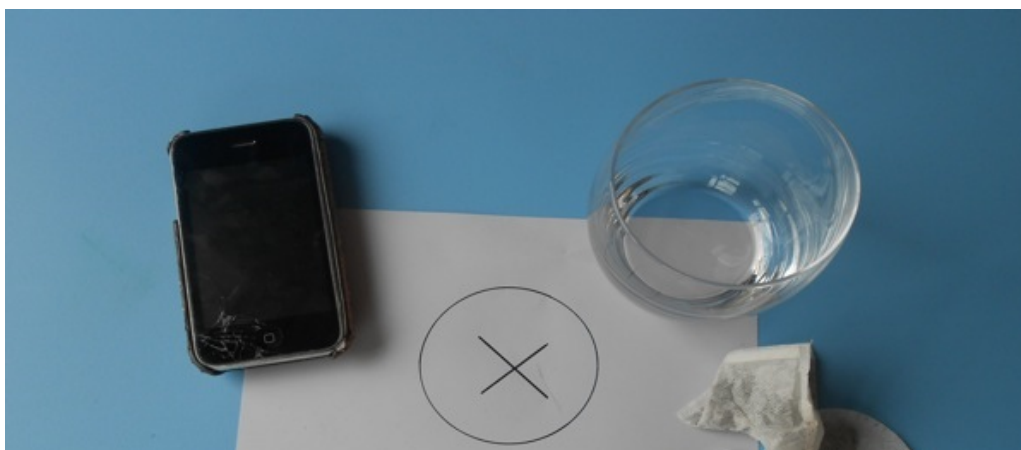
Diffusion – How does temperature affect diffusion?

Diffusion is the movement of particles from a high concentration to a low concentration.

Particles will move faster the more energy they have.

You will measure how long it takes for a pencil cross (X) to disappear using a tea bag and hot or cold water.

MAKE SURE YOU HAVE ADULT SUPERVISION WHEN USING HOT WATER. USE A THICK GLASS BEAKER TO PREVENT CRACKING OF GLASS.



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 3 times with HOT water and 3 times with COLD water (you could ask if anyone wants a cup of tea first so not to waste tea bags!).

Record your results in the table shown:

Time how long it takes for the cross to disappear each time

Basic – Carry out once using 2 different temperatures of water

Intermediate – Carry out 3 times for each temperature of water .Decide if there are any anomalies (results that look wrong) – calculate the average in each case, missing out the anomalies (add up results and divide by how many times you did the experiment. Do not include anomalies in calculation)

Extension – Do you have different styles of teabags e.g. square, round pyramid. Which diffuses faster and why? Or if you have a thermometer you can measure exact temperatures and compare results.

| Temperature of Water | Trial 1 - Time for cross to disappear in seconds | Trial 2 – Time for cross to disappear in seconds | Trial 3 - Time for cross to disappear in seconds | Average Time /seconds |
|----------------------|--|--|--|-----------------------|
| | | | | |
| | | | | |

What I found out (Conclusion):

Explain how you know which temperature had the most energy and why...

I think the cold/hot water had most energy because..

Investigating Fossil Fuels

Coal, oil and gas are fossil fuels. Coal is mainly made of carbon. Oil and gas are made of carbon and hydrogen. We burn these fuels for many reasons.

Task:

Make a poster to explain why we burn fuels.

Describe what happens when we burn fuels.

Explain why these reactions are so useful.

Explain why these reactions might not be useful

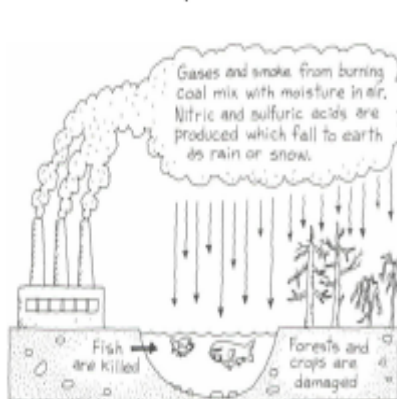
Use pictures and diagrams to help explain



| To get level | You might have: |
|--------------|--|
| 3 | <ul style="list-style-type: none"> • Identified which substances are solids, liquids or gases. • Stated one reason why we burn fuels. • Stated simply what happens when fuels are burnt. • Identified which changes can be reversed. |
| 4 | <ul style="list-style-type: none"> • Identified which substances are solids, liquids or gases. • Described some reasons why fuels are useful. • Described what happens when fuels are burnt. • Described simply whether the change can or cannot be reversed. |
| 5 | <ul style="list-style-type: none"> • Explained why fuels are useful. • Described what happens when we burn fuels, identifying the reactants and the products. • Used a simple particle model to explain some changes. • Identified some useful energy transfers. • Identified some elements, compounds or mixtures correctly. • Described some environmental problems with burning fossil fuels. |

Acid Rain

Coal contains an element called sulphur. When coal is burned it causes sulphur dioxide to form. The sulphur dioxide mixes with water in the atmosphere to make acid rain.



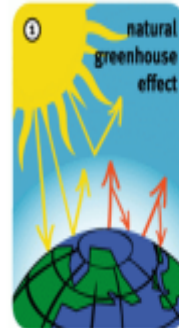
Acid rain:

- Kills trees
- Kills water life
- Damages crops
- Corrodes buildings and statues



Greenhouse effect

Greenhouse gases trap the sun's warmth. When fossil fuels are burned more greenhouse gases, like CO₂ are produced. This means that more heat from the sun is trapped by the Earth's atmosphere, causing global warming.



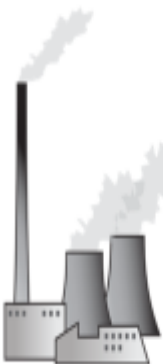
Global warming causes:

- Sea levels to rise so land disappears
- Land to disappear so people lose their homes
- Habitats to disappear so animals go extinct

Saving money and energy

Energy is very important to us. We use it to keep warm and power all the electricity in our homes, businesses and hospitals. Burning fossil fuels for electricity in power stations is:

- Efficient – not much energy is lost
- Cheaper than other ways of getting energy
- Easy – power stations can be built anywhere
- Reliable – they don't often break



Non-renewable resources

Fossil fuels are non-renewable energy sources. This means that they cannot be replaced and will eventually run out. Scientists say that natural gas will run out in 2050 – just 38 years from now.



All about energy:

- Energy is incredibly important
- We use energy to heat our homes and cook our food
- What will we do when fossil fuels run out?

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

Option One

Go to 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 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...

Word equations:



- A **word equation** shows what happens in a chemical reaction



- If a **metal** reacts with an **oxygen**, the product is a metal **oxide**
- This type of reaction is called **oxidation** = “adding oxygen to a substance”
- If the metal was **aluminium**, the product would be **aluminium** oxide
- Each different metal has a different **reactivity**, and may react faster, slower, or not at all with oxygen

Write a word equation for these reactions

Word equations –

magnesium + oxygen → magnesium oxide

copper + oxygen → _____

iron + oxygen → _____

Now try these:

- lithium + oxygen → _____
- Sodium + _____ → sodium oxide
- aluminium + _____ → aluminium oxide
- _____ + oxygen → potassium oxide
- _____ + oxygen → calcium oxide

Stretch: Write a word equation for the reaction between strontium and oxygen.



Section Four – Widening your Scientific Mind

Your Tasks. Either:

1. Imagine you are an atom of Oxygen. What happens during your day?

Write a short story, draw story board or pictures describing what happens. Some ideas to get you going:

- You are breathed in by a human or animal, what journey do you go on?
Key words to help: Inhale, Respiration, Blood stream, Carbon Dioxide, Diffuse, Lungs, Exhale, Energy, Muscles
- You are absorbed by the roots of a plant whilst bonded to some hydrogen, (H₂O or water). Where do you go? How are you released back into the air?
Key words to help: Absorbed, Osmosis, Photosynthesis, Energy, Released, Diffusion
- You are combusted (burned) with some magnesium, what happens next? What do you bond with and become?
Key words to help: Bond, Oxide, Bright Light, Vigorous Reaction

Remember: Atoms cannot be created or destroyed, only rearranged, or combined with other atoms. Oxygen likes to go around with a buddy when in nature, so will always be found as O₂ if in the air for example.

Or

Research Dmitri Mendeleev and design a poster about his discovery. You should have heard about it a lot in your Chemistry lessons!

Things to think about:

How is it arranged?

Are there any trends (things that follow a pattern)?

Is it split into sections? What are these called?

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

https://www.youtube.com/watch?v=GVU_zANtroE – Oxygen in the body

<https://askabiologist.asu.edu/recipe-plant-growth> - Plants and Photosynthesis

<https://www.youtube.com/watch?v=uSH4PQjxkWQ> – Burning Magnesium in oxygen

<https://www.youtube.com/watch?v=OfogeyWGLgI> – Dmitri Mendeleev

<https://www.youtube.com/watch?v=fPnwBITSmgU> – Periodic Table

| 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 |

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