

Science Challenge



Testing for Buoyancy

Fill a tall container with water. A clear plastic bottle with the top cut off would be good.

Choose some small items which you think will float or sink in the water. Give reasons for your predictions before you test these.

Activity-

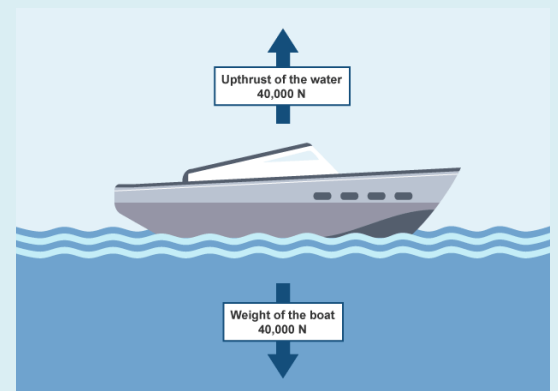
* Do this activity in the kitchen incase any water is spilled/splashed. *
Drop different objects into the water and observe how they move as they fall. Does the shape/size weight/ material it is made from effect how it behaves in the water? Time the objects and order them by how quickly they reach the bottom. Does it matter how you put the object into the water?
Can you find/design an object which falls straight through the water or takes a long time to fall?

Challenge-

When an object is able to float in water, the up thrust from the water is equal to or greater than the force of gravity acting on the object. Find out more about these forces here-

<https://www.bbc.co.uk/bitesize/guides/zttfyrd/revision/2>

Use these observations to design a buoyancy aid. Which materials would you use and why? Consider also the role of bright colours, size, shape and weight in making a practical and useful buoyancy aid.



Technology Challenge



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Plastics

Key Information

- Every year in the UK we produce 5million Tonnes of plastic. 75% of it ends up in landfill. That is a waste!
- In Nepal, plastic is thought of as something valuable that can be made into new products.

Challenge Task

What would you do?

Imagine you are a designer, engineer or scientist. What ideas do you have to improve the sustainability of plastics?

- Rethink
- Reduce
- Reuse
- Recycle

Can you design and make products from waste plastics for a UK or international market?

Engineering Challenge



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Paper Power

Have you ever wanted to design and build your own home? What would it look like?

Design: Draw a labelled diagram of it, showing materials you would use, shapes you would include and any special features it would have. Note down any buildings or places you have taken inspiration from for your design.

Construction: Design and construct a model of your dream house out of paper. You will need to measure and draw out the net of your house on paper, design and then construct it. Will you do it as one large net or would it be easier to split your house into smaller shape sections?



Can you work out the date these incredible paper constructions were built? 1995 / 1922 or 1931? Answers at the bottom.

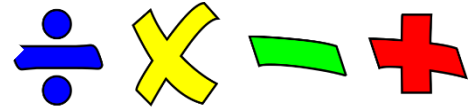
A. Paper Church After a big earthquake in Japan, engineers quickly made a building by stretching a paper "skin" across 58 paper tubes, each over 16 feet long. The church was only meant to be a temporary place of worship but was standing for many years after the earthquake.

B. Paper Towels By mistake, a factory made rolls of paper that were too thick for toilet paper but too weak for most other uses. But where others see problems, engineers see possibilities. The paper was sold as "Sani-Towels," which soon became known as paper towels.

C. Paper House An engineer built a vacation home out of newspaper. He glued newspapers into one-inch thick slabs and then used them to make the walls. It's still standing!

A - 1995 B - 1931 C - 1922

Maths & Numeracy Challenge



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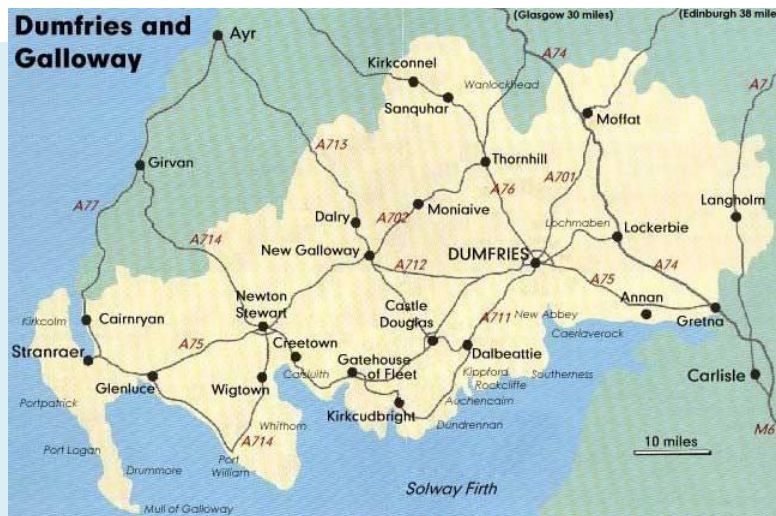
Journey Lengths – Distance=Speed x Time

The distance that you can travel is equal to the speed you travel multiplied by the time you are travelling for.

Care needs to be taken to make sure the units of measure are suitable for the calculation – eg if the speed is in **MPH** (miles per hour) then the time duration needs to be in **hours** which will give a distance in **Miles**.

- speed = **distance** ÷ **time**
- distance = **speed** × **time**
- time = **distance** ÷ **speed**

Have a look at this [BBC Bitesize page](https://www.bbc.com/bitesize/guides/z9qy3nq/revision/1/1) for more info



Road distance (miles) from Dumfries:

| |
|---------------------|
| Annan - 16 |
| Castle Douglas - 18 |
| Dalbeattie - 14 |
| Gatehouse - 32 |
| Gretna - 25 |
| Kirkcudbright - 28 |
| Langholm - 32 |
| Lockerbie - 14 |
| Moffat - 21 |
| New Galloway - 25 |
| Newton Stewart - 50 |
| Portpatrick - 76 |
| Sanquhar - 26 |
| Stranraer - 74 |
| Thornhill - 14 |
| Whithorn - 66 |

<https://www.dumfries-and-galloway.co.uk/maps/mqdp.htm>

Given that that the speed limit is 60mph in a car, the average person walks at 3.1mph and cycles at 12mph – can you calculate how long it would be to get, from Dumfries, to a selection of places using the table above - using the three different transport methods?

Why might these times be different in real life? List all the reasons.

Literacy Challenge



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Words that sound like they should!

Words that sound and look like they should!

Dreich!

Have you ever heard of this word? It describes dull and damp weather.

Sometimes words sound like they should. Watch this clip from BBC bitesize where Elaine C Smith describes some of her favourite Scots words.

<https://www.bbc.co.uk/bitesize/clips/zshmyrd>

If you drew a picture of dreich what colours would you use?
What shape would the letters be?

Calligrams are words which are written using lettering which suggests what the word means-

Big

Small

...are two very simple examples.

Can you make a calligram for dreich?

Try some of these other words as calligrams (or make up your own)- boring, exciting, bouncy, friendly



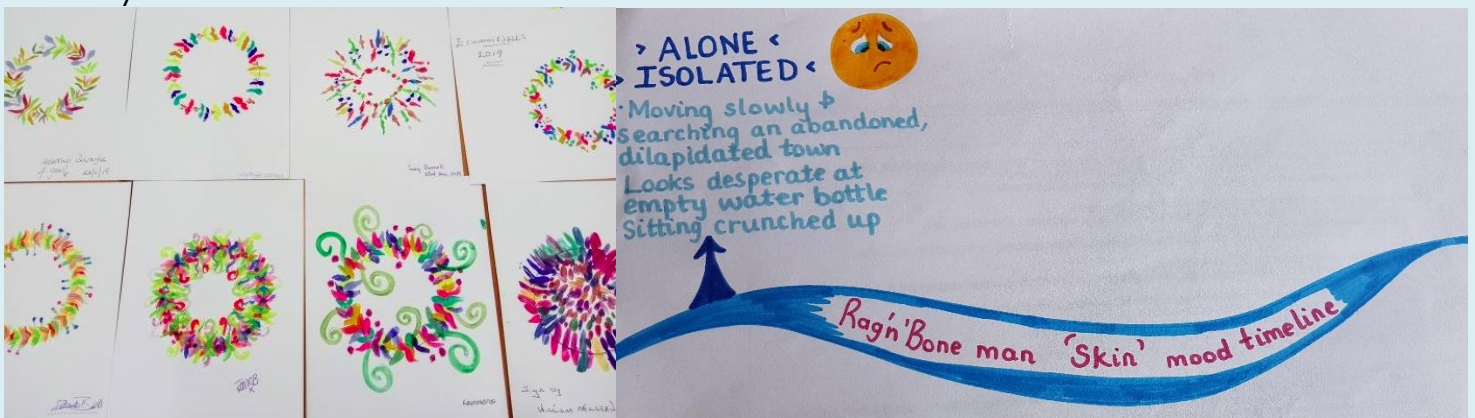
Health & Wellbeing Challenge

And relax...

Mindfulness is about focusing on the present, noticing your physical and emotional responses as well as your connection to other people in your surroundings. Try out these mindful activities to slow down and focus on your emotions and senses.

Being mindful through music...

1. On Youtube listen to [Rag'n'Bone man 'Skin'](#). On blank paper, record key words/phrases, events or emotions that really stick out to you through the song and video.
2. Write a paragraph about what you think happened to the main character and who they are thinking about. Make sure you give reasons for your thinking by finding evidence in the lyrics or video.
3. Note down key settings or events that happened during the music video. Think about how the character felt at these places – how did you know this is how they were feeling? Create a mood time-line showing how the emotions changed throughout the video. Annotate with text or images to show the causes/evidence of this feeling. Be creative – you could make this as artistic as you like!



Being mindful through art...

Draw round a plate or bowl onto a piece of plain paper with a pencil. Then using either paint or felt-tips, experiment with the thickness of strokes and combination of shapes to turn the circle into a floral wreath design. Be mindful of how you are feeling in the moment and choose colours and lines to reflect this.

Wreath photo link: <http://www.sesni.org.uk/mindfulness-art-for-stress-relief/>

Social Studies Challenge



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Food Finding Mission

So much of our culture is reflected in the foods we eat. And sitting down for a meal is something everyone enjoys.

You are going to think of your favourite dish and trace its ingredients back to the source.

For example, if spaghetti and meatballs is the meal you can't get enough of, seek out the origin of the pasta and beef you use, and then break down the sauces' ingredients too... besides tomatoes, what else is in there?

Basil is used in dishes all over the world (Italy, Thailand, Vietnam), but probably originated in India. How about oregano? It was first used in the Mediterranean.

Do you have any onion in there? Was it grown locally or did it make its way to the grocery store from another state or country?



For more info: <https://www.worldatlas.com/articles/what-is-a-food-mile.html>

Expressive Arts Challenge



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Dance Designing

There are lots of celebrities providing daily lessons over the internet – one that focusses of dance is Oti Mubuse, from BBC's Strictly Come Dancing and Marius Lepure.

These dances can be found on her [YouTube Channel](#)

Please feel free to do the dance routine too but your challenge is to follow the routine and identify the body parts and actions throughout the routine. Using the [Muve Tool box resources](#) will provide a great bank of possibilities.



Perhaps you could create your own routine using the Muve cards for a younger, or old person, in your household?