Learning from Home

Under the Sea

(Part 2)

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Science Challenge

Weighing Without Scales

- When objects float on water the force keeping the object afloat is called **upthrust** (also known as **buoyancy**) and this balances the weight of the object.
- When something is placed in the water, the water that moves out of the way. We say the water is **displaced**.
- For floating objects, the weight of displaced water is equal to the weight of the object.

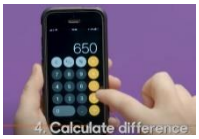
To weigh a floating object without scales You will need**:**

- Measuring jug
- An unpeeled orange (or other fruit or veg)
- Calculator
- Paper
- Pen
- Weighing scales

Activity and pictures from TES

Instructions

1. Fill the measuring jug with water up to the 500ml line.
2. Make a record using your paper and pen as shown here.
3. Place the orange in the water. Does it float or sink?
4. Measure the volume of the water again and record this on your paper. An example is shown below. *Note this may differ from your experiment.*
5. Now work out the difference.
6. The difference is the second number minus (take away) the first number.
7. Finally dry off your orange and weigh it using your scales. Were you correct?

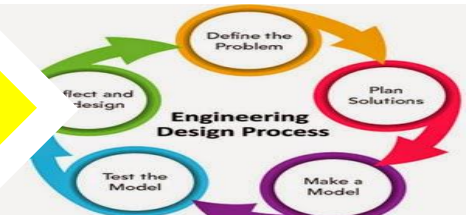


The Science ***Every 1ml (Volume) of water = 1g (Mass)***

What is upthrust?

When objects float, they push water out of the way. We say the water is **displaced**.
The water pushes back with a force we call **upthrust**. (**Buoyancy**)
The water continues to be pushed out of the way until the upthrust equals the weight of the object.
If the water that is displaced is weighed, we find it has the same weight as the object that is floating.

Engineering Challenge

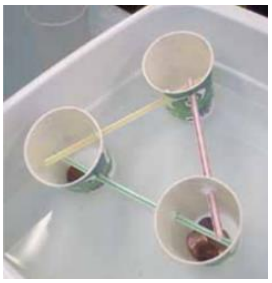


Whatever Floats Your Boat

Your challenge is to build a boat that can float and support the weight of 25 x 1p coins for at least 10 seconds without leaking, sinking or tipping over.

You will need:

- Plastic straws or wooden lolly sticks
- Paper cups
- Duct tape or Sellotape
- Cling film
- 25 1p coins (or whatever number you can get if you don't have 25)
- Large container for the water or a bathtub.



Activity and pictures from www.stem.org.uk

Instructions:

First, draw a plan of what you think your boat will look like, labelling it with the materials you plan to use.
Use the materials to build your boat.
Then test it by floating it in a container of water and adding pennies, one at a time.

Discussion:

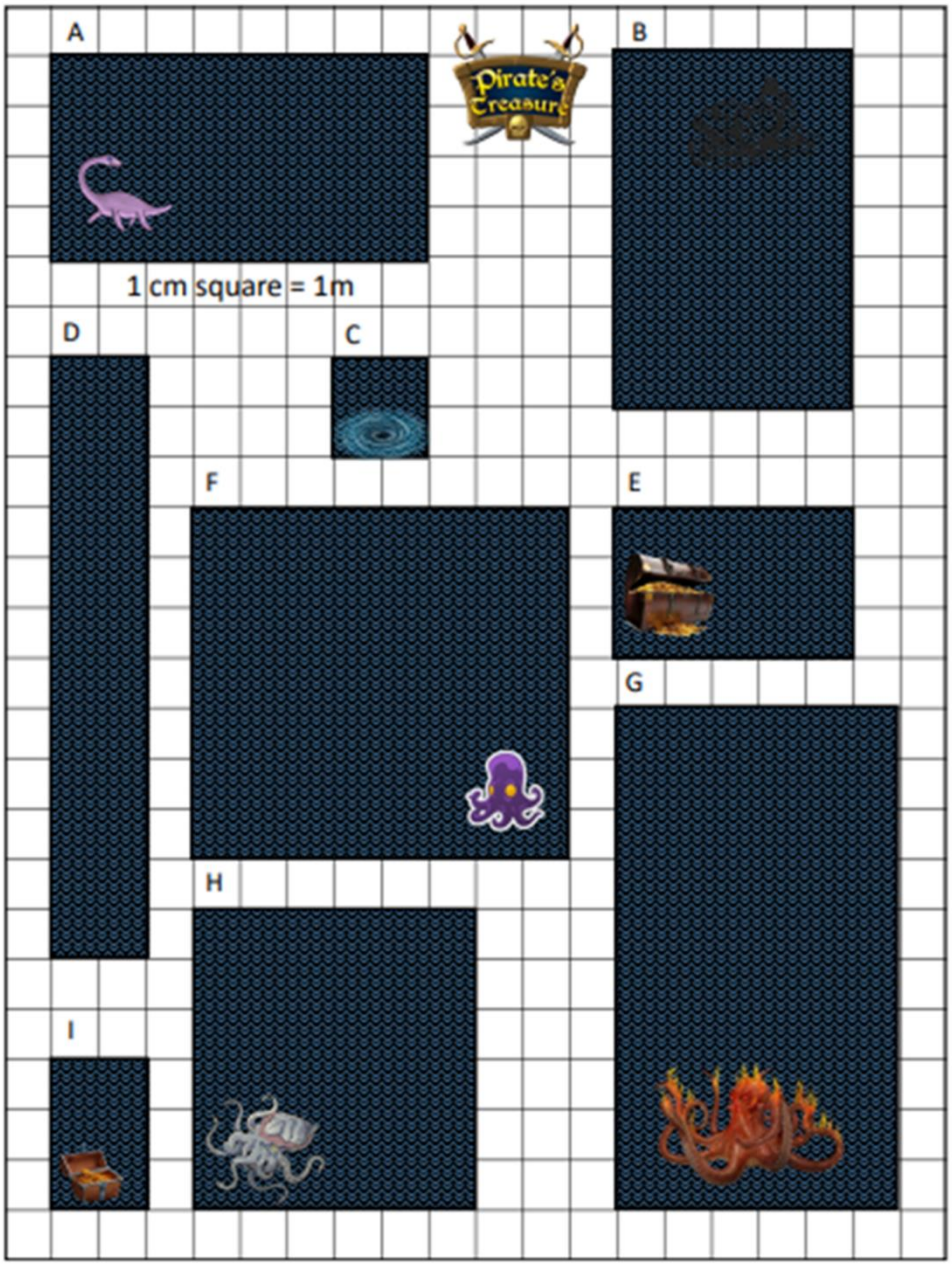
When you test your boat, it may not work as hoped. When engineers solve problems, they try different ideas, learn from mistakes, and try again. The steps they use to arrive at a solution is called **the design process**. They study the problems and then redesign their model to try and overcome them.
For example, if the boat sinks easily - increase its ability to float. When you set your boat in water, notice how it sinks down a bit, pushing aside some water. The water pushes right back, pressing on the boat's bottom and sides. The force from these pushes is called **buoyancy**. To change your boat's buoyancy, experiment with the boat's width and the height of its sides.
If your boat leaks a lot - check to see if the straws are filling with water or if the plastic wrap is separating.
Check how near the coins are to each other. A boat can get unsteady and tip when one part is heavier than another.
Extra Challenge: If you succeed with 25 x 1p coins can you make it to 30? **OR** can you use some other coins instead? What is the greatest value in coins you can successfully float?

Maths & Numeracy Challenge

Pirate Perimeter Problems

Have a look at the Pirate map. You will see 9 areas which have been mapped out. Can you match the correct ships with their correct zones? Which zones are left over? Could any ship use more than 1 area?

(Remember Perimeter = the distance around a shape)



Activity and images from www.mathematicshed.com

1. A monster has attacked Pirate Pegs ship and she needs to dock quickly in water with a perimeter of 30m. Which area of water should she dock in?	
2. Captain Jack needs to have water with the perimeter of 28m to launch his boat. Which stretch of water would suit his needs?	
3. Captain Pugwash needs to launch his boat in water with a perimeter of 8m. Which area should he choose?	
4. Long John Silver has a boat full of booty and needs to dock in water with a perimeter of between 28m and 34m. Which area of water can he choose?	
5. Captain Bones has run out of seed for his parrot and needs to dock quickly in water with a perimeter of 16m. Which area should he dock in?	
6. Captain Hook has run out of rum and needs to dock quickly in water with a perimeter of 10m. Which area of water should he dock in?	
7. Blackbeard has taken a lot of damage to his boat and needs to dock in water with a perimeter of 24m. Which area of water can he choose?	

Literacy Challenge

Underwater Haiku

A haiku is a short form of poetry which originated in Japan. A haiku has 3 lines with a set number of syllables in each.

There can be any number of words, but there must be **5** syllables in the first line, **7** syllables in the second line and **5** syllables in the third line. Haikus do not have to rhyme. (**5**,**7**,**5**)

A syllable is a single sound within a word. Words can be broken down into one or more syllables. The word cat has 1 syllable. Habit has 2 syllables; habitat has 3 syllables and so on. Say them out loud and hear for yourself.

Click here for information about syllables: https://www.youtube.com/watch?v=TvcgVRULaWw&t=9s

Click here to watch someone write a haiku: https://www.youtube.com/watch?v=ZQQmv38Xgt0

Your Task:

Try writing your own haiku linked to the theme of **Under the Water**.
Here are some nice examples adapted from **TES**.

Word bank: green, speckled, webbed, swim, jump, hop, water, eyes, logs,

Green and speckled legs, (5)

Hop on logs and lily pads, (7)

Splash in cool water. (5)

Below the water,

Waits cold, blue, hungry, and more,
For someone to come!

Clipart images from: classroomclipart.com

You don't need to limit yourself to just one haiku. For example, you could write one for a creature found underwater and another for an object like a submarine or a treasure chest.
Write neatly and decorate the paper with pictures of your chosen subject.
Perhaps you would like to type it up on a word document and add clipart and a background.
Well done! Keep being creative and remember to share your work with someone at home if you can.

Health & Wellbeing Challenge

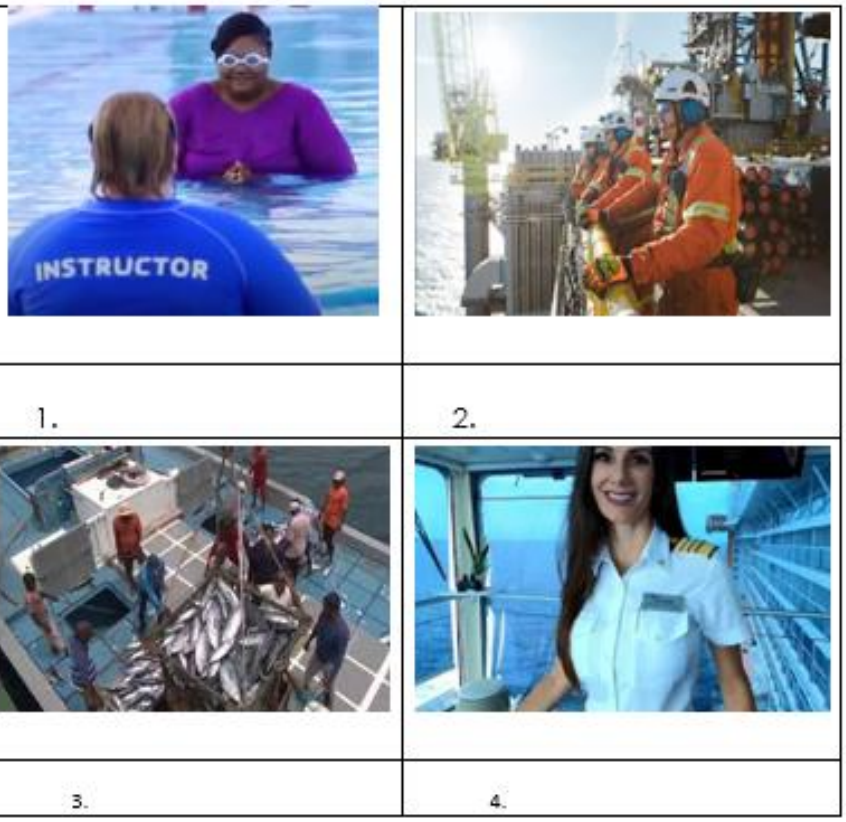
Water Work

These people all have jobs which involve water in some way.

Cruise ship captain	Fisherman
Swimming teacher	Oil rig worker

Firstly, match the jobs to the correct picture.

Have a think about the skills that each job needs – are they all the same? What qualifications do you think each one needs?



Pictures from: youtube.com

Can you think of any other jobs or careers which involve water?

Pick one of the 4 jobs shown.

Now compare your qualities and skills with those you have identified for the role you chose. Write down a list of things you enjoy and things you are good at. Are there further skills you would need to be able to do that job or do you have many of the skills already?

If you have access to the internet, you might be able to search more in-depth regarding career options based on your interests. Make sure you have permission from a grown up at home first.

Social Studies Challenge

Sources of Water

What do you know about where our water comes from?

Watch this video to find out more:
https://www.youtube.com/watch?v=zbSJJfr9IVM

In the past, people collected their water from ponds, streams, rivers or wells. In some countries people still do!
Today, for most of us, water is brought directly to our homes through pipes which then connect to taps.

Look at the 3 pictures below then answer the questions.
(Discuss your answers with a grown up.)

 Picture 1	 Picture 2	 Picture 3
Collecting water from a water pump	**Water from a sink**	**Collecting water from a river**

Images from Wateraid.org and classroomclipart.com

Task:
Look at each picture. What problems might there be with obtaining water from each source. Do you think there could there be any health risks? Do any of the methods shown have an advantage over the others? Why?

Extension: Can you find out a country which might still obtain water via the method shown in picture 3? What issues could this cause?

Expressive Arts Challenge

Shipwrecked

Drama activity - you are going on a cruise somewhere warm and tropical…

1. Pretend that you are packing your suitcase – what will you take with you?
2. Go on board the ship. You have to walk up a gangway (plank) before you meet the captain. Can you walk normally while holding a heavy suitcase and walking uphill? Have a go.
3. Inside your cabin, you unpack your case and get ready to explore the ship. What do you see? Who else is onboard? Have you brought everything you need?

Listen to this excerpt from '**The Storm**' from **The Flying Dutchman** by **Richard Wagner**.

https://www.youtube.com/watch?v=1hVO9rof7e0

You have been onboard for several days and oh no, there is a storm happening. The ship is now sinking, and you have been told you must abandon ship.

4.What items will you take with you? You only have a short time to decide what you will take into the water with you.

Share your ideas with someone at home, maybe they could take on the role of the captain or another passenger.