



**Teacher's Resource sheet
Episode 6**



**Curriculum Strand – Environmental Awareness
Strand Unit – Materials**

Aims and Objectives:

To explore the characteristics of everyday matter, in particular their density.

Class plan

Suggestions:

- ✓ Ask warm up questions with the class
- ✓ Watch the video
- ✓ Fill out the first two questions of the investigator's sheet (see resources below)
- ✓ Do experiments in class
- ✓ Complete the investigator's sheet

Resources contained in this print out:

- ✓ Curriculum questions explaining
- ✓ Some warm up question suggestions
- ✓ The Science Investigators Density episode can be accessed here:
<https://scienceinvestigators.wordpress.com/about/episodes-and-resource-sheets/>
- ✓ Experiments to do in class (resources and instructions are included)
- ✓ An investigator's sheet for pupils to discuss and fill out for each experiment

Curriculum Question Suggestions with answers (also addressed in the episode):

Explaining:

- Matter
- Density

Question 1

What is matter?

Answer:

Matter is defined as anything that has mass, anything that takes up space. Matter is all around us, in the air we breathe, and the things we touch and breathe. Matter can exist in 3 major states, as solid, liquid or gas.

Solids:

Matter is composed of atoms. When the atoms are packed tightly together the matter appears solid. You can't walk through a solid wall because the matter is packed too tightly to allow you to move through it.

Question 2

What is density?

Answer:

Basically, density is how compact an object is, how tightly packed the atoms are. Put another way, density is the mass of an object divided by its volume. Volume is the amount of space that something takes up. So density is how heavy something is divided by how much space it takes up. This means that a 5cm block of wood is not as dense as a 5cm block of steel. There is more space between the atoms of the wood than the atoms of the steel.

The other thing you need to know when finding out the density of an object is its mass. Mass is actually quite difficult to explain, and the best way to think of it (for the time being) is how heavy something is. However, mass is slightly different than weight. Weight is a force, and is affected by gravity. An object would weigh less on the moon than on the Earth, because there is less gravity there. Mass stays the same wherever you are: the earth, the moon, or floating in outer space!

EXPERIMENTS

The materials for each are listed with the instructions below.

To clean up:

- ✓ Kitchen towel
- ✓ Rubber gloves
- ✓ Cleaning agent

Experiment 1: Make a carrot float

You will need :

- ✓ A bowl of water
- ✓ Salt
- ✓ Vegetables(carrot)

Directions:

Drop the carrot into the bowl of water.
Watch it sink to the bottom.
Add salt gradually to the water.
Watch the carrot slowly rise and float.

What is happening?

Adding salt to water makes the water denser so this will cause something to float. If you've ever heard of the Dead Sea, everything floats on top of it because it is very very salty.

Experiment 2: Making a density tower

You'll need:

- ✓ A jug or container. Glass works best so you can see what's inside.
- ✓ Honey
- ✓ Washing up liquid
- ✓ Milk
- ✓ Vegetable oil
- ✓ Tomatoes
- ✓ Bolt
- ✓ Ping pong ball

Directions

1. Pour a layer of honey into the jug
2. Carefully add a layer of washing up liquid
3. Then add milk, pouring carefully
4. For the last layer, add vegetable oil to create a tower

If you have poured everything carefully in, you should now have a density tower, with each liquid clearly sitting on top of the one below.

5. Now add tomatoes to see where they float, then the bolt, and a ball to see where they land

This will show you which liquids and solids have different densities.

INVESTIGATORS SHEET

What are we going to do?

What do you think will happen?

What actually happened?

Why do you think this happened?
