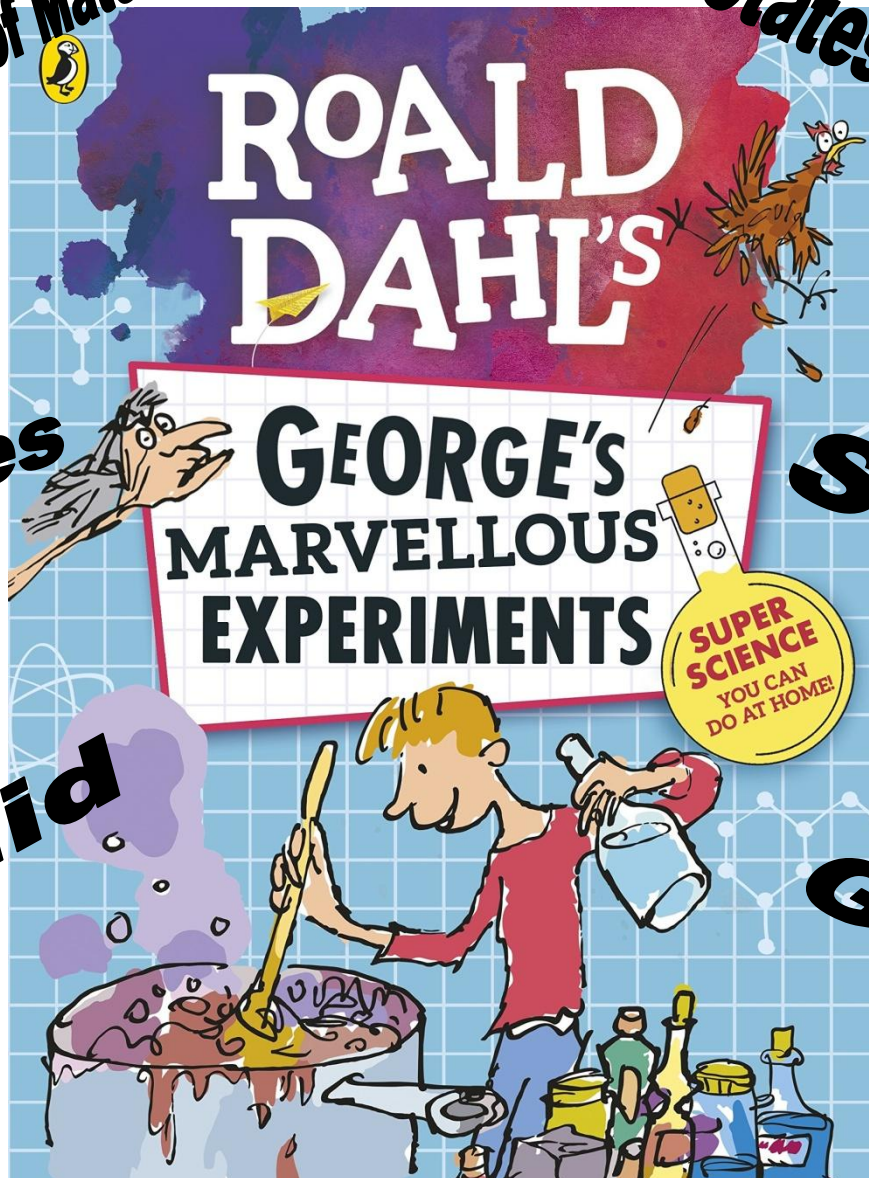


Properties of Materials

States of Matter

Changes



Solid

Liquid

Gas

And

ROALD DAHL'S SENSATIONAL WORLD OF SCIENCE

Have a go at a range of these Science Activities based
on Properties of Materials, Changes and States of
Matter:

PART A

Learning the fundamentals needed in this Topic

PART A

You may need to do some research to help with some of the following tasks - A good place to start in BBC Bitesize as they have many videos and activities covering the topics needed while still explaining it well:

<https://www.bbc.co.uk/bitesize/topics/zryycdm>

Topics

Types of materials >

[How to identify materials](#)



[36 Class Clips](#)

Changing materials >

[What is dissolving?](#)

[What is separation?](#)

[What are irreversible changes?](#)



[25 Class Clips](#)

Solids, liquids and gases >

[What are the states of matter?](#)

[What are freezing and melting?](#)

[What is evaporation and condensation?](#)

[What is the water cycle?](#)



[9 Class Clips](#)

Materials >



How to identify materials



Changing materials

3 guides



Solids, liquids and gases

4 guides

Task 1: Grouping and Comparing Materials

How do you group and compare materials?

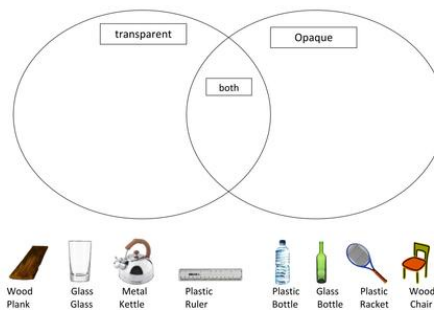
Get 10 different everyday items and place them on a table or on the floor.

How many different ways can you group all of these materials?

Think about the properties of each and any major similarities and differences e.g. Is it hard? Soft? Liquid? Solid? Waterproof? Bendy?

Record your results in an interesting way

For example:



Sort the Materials

Wood	Metal	Glass	Plastic



Task 2: Scientific Vocabulary

Use the sheet below to help you develop understanding of the key scientific words you will need to understand to help you with this Science Unit of Work.

Materials Properties and Definition

Put the correct definitions with the property words in this table.

magnetic	
reflective	
absorbent	
permeable	
translucent	
flexible	
hard	
flammable	
insulating	
transparent	

Is attracted to magnets.	Easy to bend.
Will bounce light off its surface.	Will easily catch fire and burn quickly.
Is able to soak up liquid easily.	Solid, firm and rigid, not easily broken, scratched or pierced.
Will allow liquids and gasses to pass through it.	Will stop energy such as electricity or heat from transferring through.
Will let some light pass through them but not enough to see detailed shapes.	Light passes through easily and objects are seen clearly.

Task 3: George's Marvellous Materials...

Take a look at the objects listed in the table below that George uses in the story - Fill in the columns thinking about the material they are made from, why it is made from that and what would not be a good material to make that object out of?

A first example has been done for you...

Remember to use some of the Material Property vocabulary from previous task to help you help explain your answers.

Name of Object	What it is used for?	Made out of..... because....	Not made out of because....
Grandma's Tea Cup	To hold hot tea in so that it can be drunk from easily	China because it is fairly strong, waterproof and rigid so it holds its shapes and doesn't leak tea all over the place!	Paper because it would rip and go soggy as it is not waterproof or strong enough to hold the tea!
Tyre of his Dad's Car			
The Saucepan			
The Spoon			
His Red T-Shirt			
His Kitchen Window			
The Stairs			
<u>My Choice:</u>			

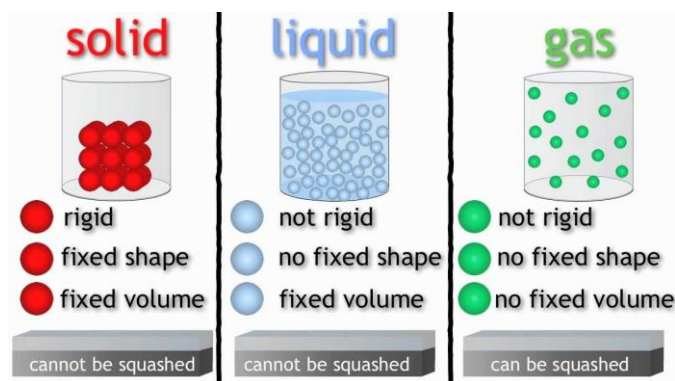
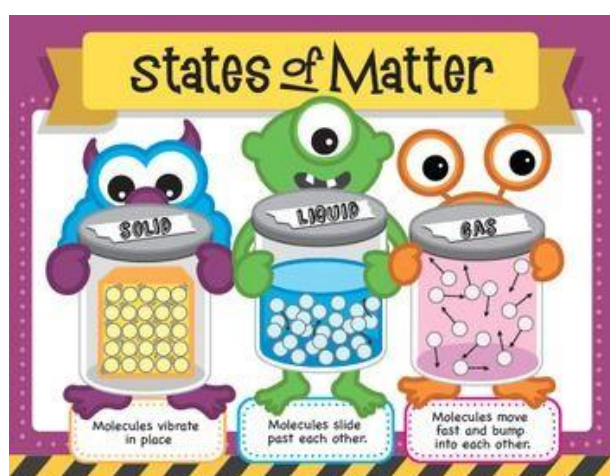
Task 4: States of Matter

What is a Solid, Liquid and a Gas?

Create a poster or information leaflet explaining these 3 states of matter

This poster must include the following information for each one:

- Name
- Properties
- What do the particles/molecules look like within that state?
- Examples
- Diagrams and pictures, labelled where needed



Difficult choices - Is it a solid or liquid?

Material	Why you might think it is a liquid?	Why you might think it is a solid?	What do I think?
Sand			
Shaving Foam			
Slime			
Ice Cream			

Task 5:

Amazing Matter

Tar pitch, the material used to coat roofs and roads, is actually a liquid that flows incredibly slowly. Each drop takes approximately ten years to form and then drop.

Use what you know about matter to help the mouse to find the cheese. Colour the squares about liquids red, the squares about gases green, and the squares about solids yellow. Then draw a line on the yellow path for the mouse to get to the cheese.



liquid	solid	has a definite size but no shape			water takes this form above 100°C
has a definite size and shape	gas	has no definite size or shape		can be poured	
		water takes this form below 0°C	takes the shape and size of any container		things take this form when they freeze
takes the shape of the container but not the size		water changes to this state between 0°C and 100°C	water changes to this state above 100°C		
	solids take this state when they melt				liquids take this state when they evaporate

Task 6: Hot and Cold - Changing state investigation

Instructions: heating up and cooling down

Apparatus:

silver foil
small pieces of butter,
chocolate, ice, cheese
kettle
large bowl

Method:

- Make four small cups out of the tin foil.
- Place a small piece of chocolate into the first cup.
- Repeat for the other substances.
- Place foil cups into bowl.
- Teacher to pour hot water into the bowl.
- Observe and record any changes to the substances in the table below.

Fair test:

Explain what *variables* you will need to keep the same to make this a fair test.

.....

.....

.....

.....

Prediction

Material	What will happen to the substance as it is heated up?	What will happen to the substance as it cools down?
Butter		
Chocolate		
Cheese		
Ice		

Results: heating up and cooling down

Material	What did happen when it was heated?	What did happen when it cooled down?
Butter		
Chocolate		
Cheese		
Ice		

Were your predictions correct? Why did the changes occur? Write a short summary of what happened.

Were the changes you discovered reversible?

Can you think of any heating or cooling experiments where you would get an irreversible change?

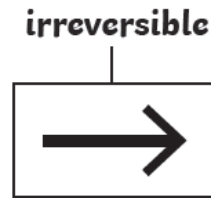
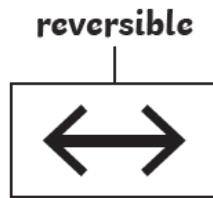
Reversible & Irreversible Changes

In a reversible change the materials change back to how they were before. In an irreversible change the materials can't change back to how they were before.

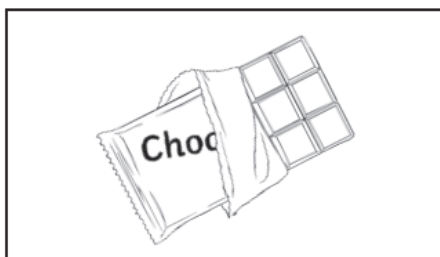


Task 7: More Changes!

Reversible and Irreversible Changes



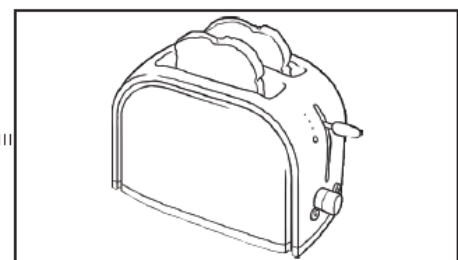
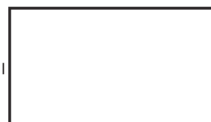
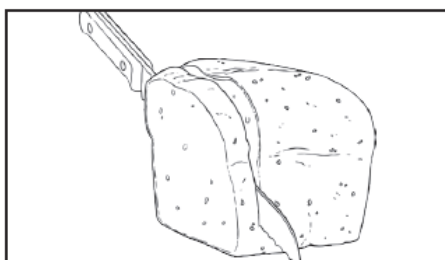
Using the key above draw the correct arrow between the pictures. Write whether each transformation is a reversible or an irreversible change.



Melting chocolate is _____ change.



Freezing water is _____ change.



Toasting bread is _____ change.

Task 8: Water?



Water is a naturally occurring material that can be found in 3 states of matter: solid, liquid and gas. In the different states the particles are really close together (as it is when it is a solid), loosely held together (as it is when it is a liquid) or far apart (as it is when it is a gas).

Think about when you have observed water in these 3 different states. Draw an example to show water in each state.

Solid	Liquid	Gas

Draw and label the particles in their 3 different states.



Solid	Liquid	Gas

What do we call water in its solid state?

What do we call water as a gas?

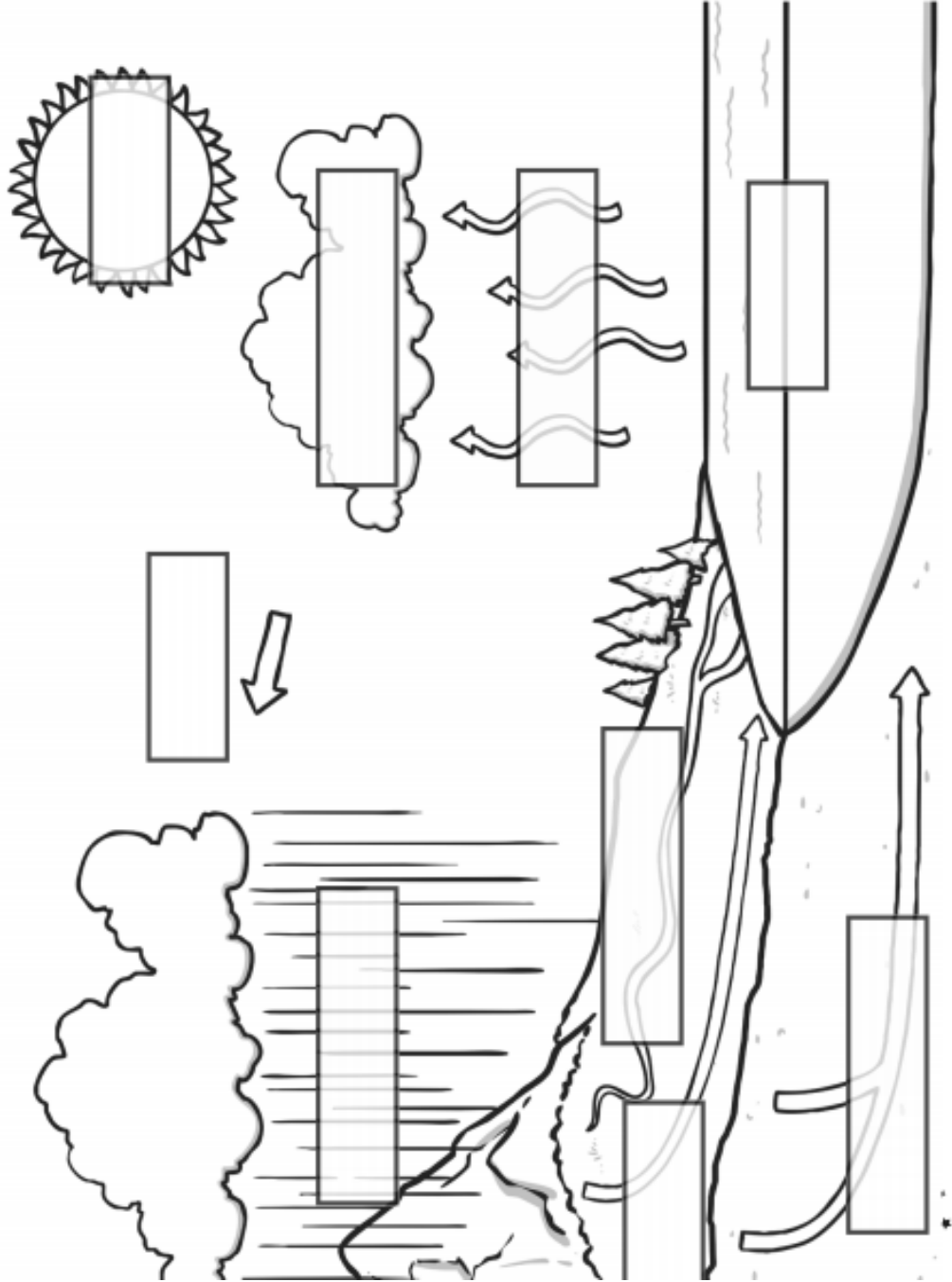
What do we call the process of turning water from a liquid to a solid?

What do we call the process of turning water from a solid to a liquid?

What do we call the process of turning water from a liquid to a gas?

The Water Cycle

All the water on the Earth has been around forever. The water cycle keeps our water supply going around and around



Label the diagram of the water cycle using the words below:

rivers and streams

precipitation

runoff

underground water

sea

wind

sun

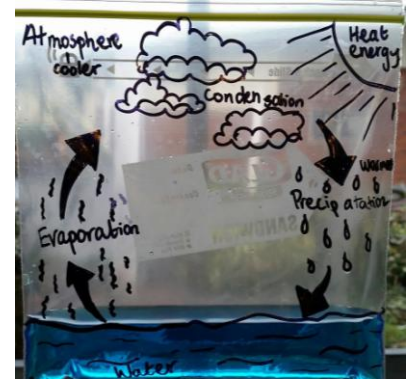
evaporation

condensation

Task 10: The Water Cycle in a Bag!

Watch this video below or read the instructions below and try and create your very own water cycle in a bag:

https://www.youtube.com/watch?v=VZB44_XOpFw



Water Cycle in the Bag Model Activity

You will need:

- Sealable plastic sandwich bag
- Water
- Permanent markers
- Blue food colouring
- Tape
- Window with exposure to sunshine

Instructions:

1. On the plastic sandwich bag, draw a diagram of the water cycle. Be sure to include:
 - a. sun
 - b. clouds
 - c. water accumulation (at the bottom of the bag)
2. On the plastic bag, draw arrows and labels for:
 - a. evaporation
 - b. condensation
 - c. precipitation
 - d. accumulation
3. Fill approximately $\frac{1}{4}$ of the bag with water.
4. Place 2 drops of blue food colouring into the water.
5. Seal the bag.
6. Tape the sealed bag onto the window. The window will need to have plenty of sun hitting it to show the process of the water cycle.
7. Allow the bag to be in direct sunlight for about an hour, then observe the process in the bag and identify the different stages of the water cycle.

