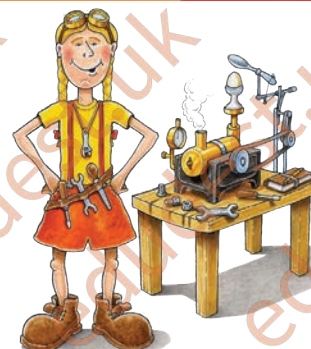


States of Matter at the railway

STUDENT INTRODUCTION

- ▶ At the Isle of Wight Steam Railway, you can see particles and energy in action
- ▶ This resource allows you to use what you've learned in the classroom to the real-life railway environment!



The particulate nature of matter

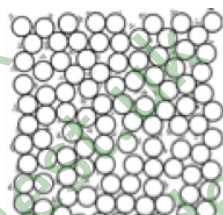
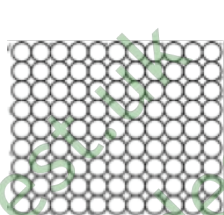
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Coal + oxygen → carbon dioxide + water. This reaction is irreversible.

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- ▶ The particle diagrams below show atoms as **solid**, **liquid** and **gas**:



Task

Label which of the particle diagrams above show the state of matter for the:

1. Steam
2. Railway line
3. Water in the engine

Complete the following to show your understanding:

The particles in _____ are very close together and in a _____ pattern.

They can _____ about a fixed point.

Particles in _____ are still close together but are arranged _____.

They can move by _____ over each other.

Particles in a _____ are spaced far apart. They can move _____ in any direction.

Word Bank

quickly solids liquids gas randomly regular vibrate sliding

Complete the following table as you move around the railway:

Railway material encountered?	Solid, liquid or gas?	Compound or element?
Coal		
Water		
Steel		
Glass		
Wood		
Concrete		
Stone chips		
Brass		
Plastic		

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► When the train moves along the track, friction heats up the wheels and rail.

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► Iron is a metal element and carbon is a non-metal element.

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The three states of matter can be changed to one another:



Questions

1. Is the boiling of water (to power the engine) a **chemical reaction** or a **physical change**?
2. Is the burning of coal (to heat the water) a **chemical reaction** or a **physical change**?
3. Which of these two is a reversible change?

