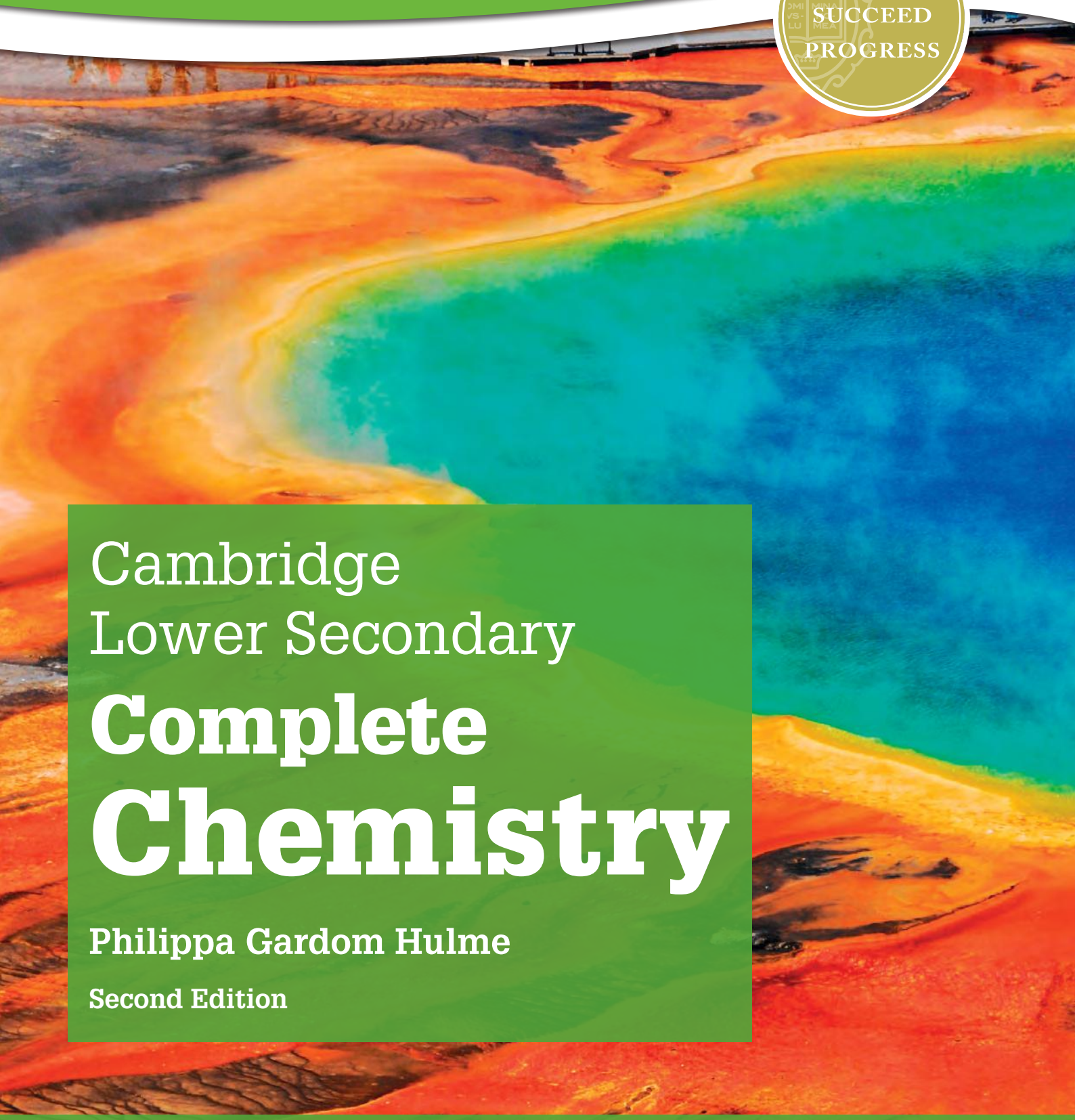
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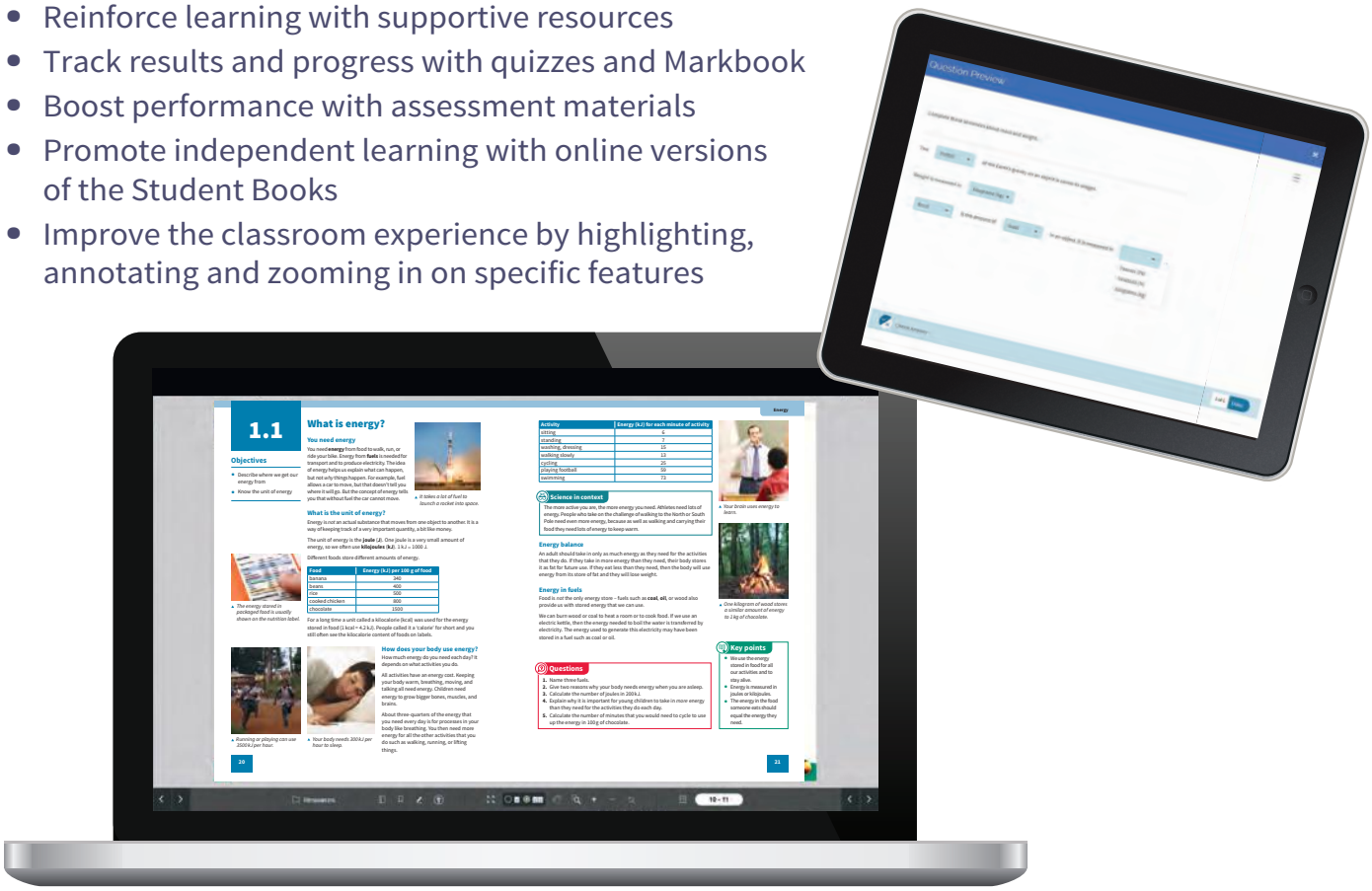
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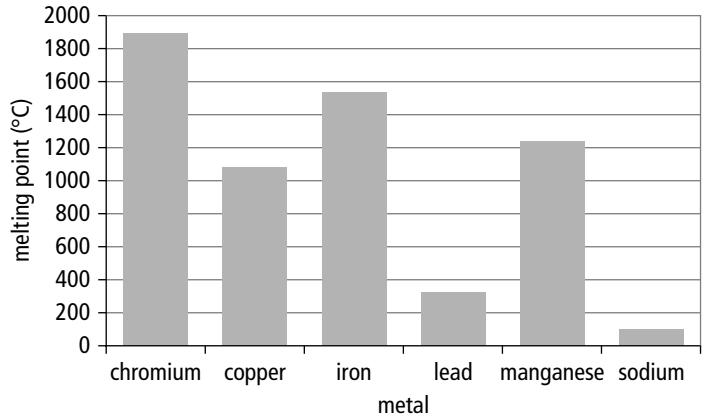
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1.6 Changes of state – melting and freezing

1. Highlight the correct word or phrase in each **bold** pair in the paragraph below.

When a substance melts, it changes state from **solid / liquid** to **solid / liquid**. During melting, the particles **move into/move out of** a regular pattern. The particles start to **vibrate on the spot / move around**. In both the solid and liquid state, the particles **are close to each other but do not touch / touch each other.** A substance has a high melting point if its particles hold together **weakly / strongly**.

TWS **2.** The bar chart shows the melting point of six metals.



a. Name the substance in the bar chart with the lowest melting point. .....

b. List the substances in the bar chart in order of increasing melting point (lowest first).

.....

.....

TWS **c.** A scientist measures the melting point of an unknown metal as 1050 °C.
Which metal on the bar chart is it most likely to be? .....

Extension

TWS The table gives melting points and boiling points of some substances.

Substance	Melting point (°C)	Boiling point (°C)
water	0	100
chlorine	–101	–34
bromine	–7.3	58
mercury	–39	357
ethanol	–114	78

a. i. Name the substance in the table with the highest melting point. .....

ii. Name the substance in the table with the highest boiling point. .....

b. Draw a horizontal temperature scale for the temperatures in the table.
Make sure the divisions on the scale are equal, and that the highest and lowest temperatures will fit.

c. Mark the melting points and boiling points of the substances on your scale.

d. i. Give the state of chlorine at 30 °C.

ii. Give the state of ethanol at 20 °C.

TWS **iii.** Name the substance that is in the liquid state for the greatest temperature range.

1.7 Models in science

Thinking and working scientifically

1. Circle the letter next to the *best* definition of a model in science.

A. It is a smaller version of the real thing.

B. It is an idea that explains observations.

C. It is an idea that helps in making predictions.

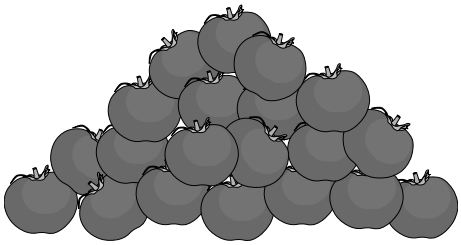
D. It is an idea that explains observations and helps in making predictions.

2. The particle model has strengths and limitations. For each statement, write a tick (✓) in the correct box in the table.

	This is a strength of the particle model	**This is a limitation of the particle model**	**This can be a strength or a weakness**
The particle model explains why some properties of a substance are different in the liquid and gas states.			
In the particle model, each particle is a sphere.			
The particle model cannot explain all properties.			
The particle model explains why different substances have different melting points.			
Some predictions made with the particle model are not correct.			
The particle model is simpler than reality.			

3. A teacher uses tomatoes to represent the particle model.

Suggest how this model is better than, and worse than, representing the particle model in a drawing.



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