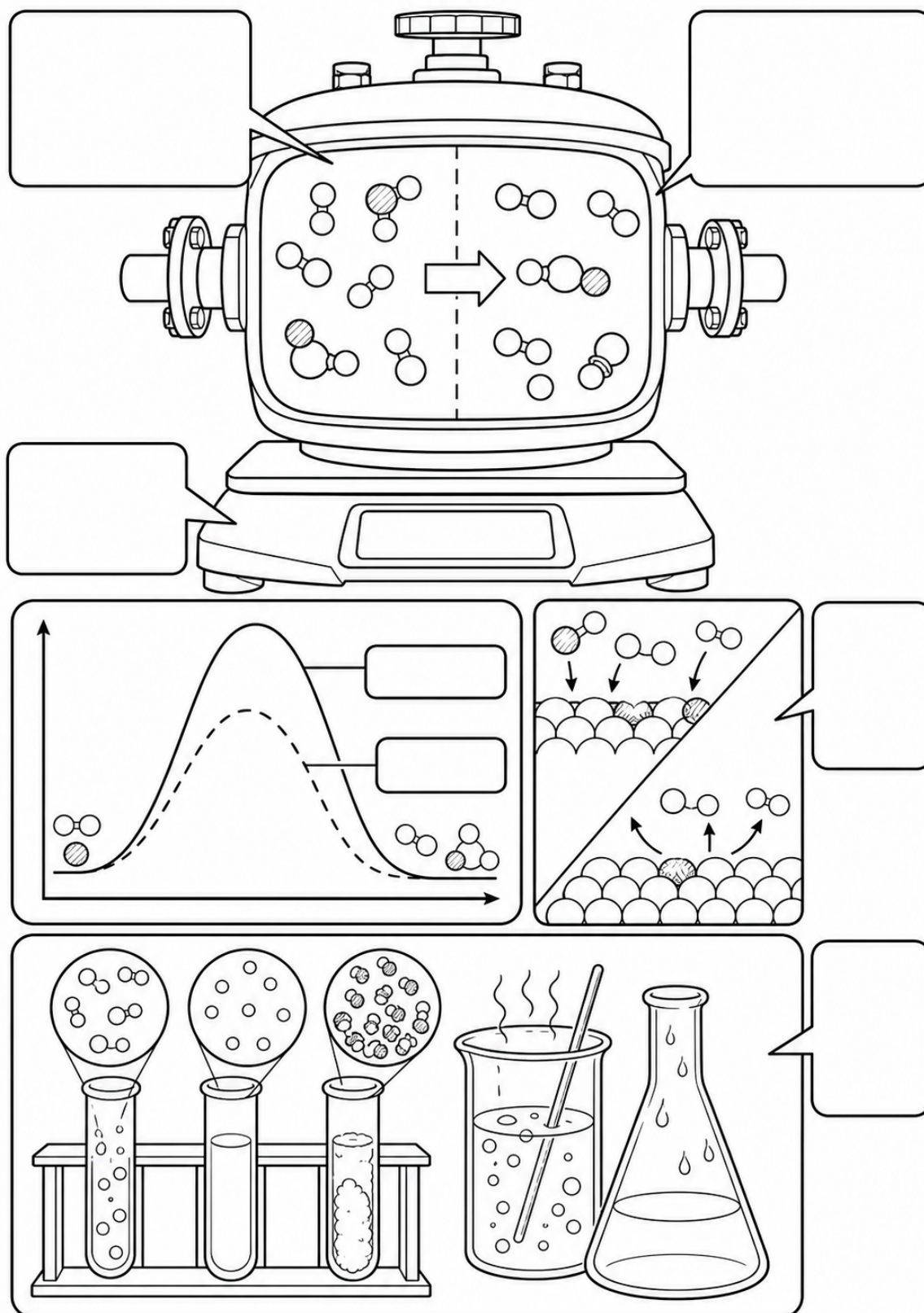


Chemical Reactions: Mass, Energy and Catalysts

KS3 / Year 9 - Science

Compare before and after particle models, check conservation of each atom type, interpret the energy-profile routes and explain how a catalyst changes pathway but



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Parent & Teacher Guidance

Curriculum focus

Topic: Chemical reactions. Develop accurate observation, subject vocabulary and evidence-based explanation. Mapped scope: KS3 Science: chemical reactions, conservation of mass, energy changes and catalysts as lower-energy reaction pathways..

Before you begin

Review the picture together and ask the learner what they already notice about Chemical reactions. Read the activity aloud, explain unfamiliar vocabulary, and agree which details need special attention.

Solo activity

The learner can complete the colouring independently, then use the finished page to explain three details linked to Chemical reactions. Encourage accurate colour choices where they carry meaning, but allow creative choices elsewhere.

Group activity

Give pairs or small groups different areas to inspect. Ask them to agree on evidence before colouring, compare their findings, and present one curriculum fact to the class. Finish with a whole-group check against the guidance below.

Questions to guide discussion

What evidence can you see? Which feature is most important and why? How does one part connect to another? What new fact about Chemical reactions can you explain using the picture?

Answers and checking

Balanced particle models retain the same number of each atom type while bonds/arrangements change. The higher route represents a larger activation barrier; a catalyst offers a lower-activation-energy pathway and is not used up overall. The closed-vessel balance models conservation of total mass.

Learning record and next steps

☐ Completed the colouring

☐ Explained key vocabulary

☐ Completed the activity

☐ Used visible evidence

Evidence noticed / vocabulary used

Next step:
