

Conditions That Affect Change

Catalyst Catwalk with Fizzling

Learning target

Use a one-variable comparison to investigate a change.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Temperature; amount; mixing; surface area; fair comparisons

Open Catalyst Catwalk - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Conditions That Affect Change - key ideas

1. Read the fair-comparison plan

Conditions such as temperature, amount, mixing or surface area can affect how quickly some changes occur. The effect depends on the particular process.

2. Separate a plan from its results

A fair comparison changes one chosen factor while keeping other relevant conditions alike. Repeated trials make results more useful.

3. Make a justified claim

Our plan compares equal amounts of the same material in equal water volumes. A is warm and B is cool, so water temperature is the chosen difference. No rate results are supplied: the plan identifies the conditions, not which trial is faster.

Keep the science accurate

Temperature is the chosen difference in the supplied plan. No rate outcome is given. Keep material, amount and water volume alike, and repeat observations to check consistency.

Apply the evidence

Use the supplied records and teaching model. Explain which details support the classification or comparison, and which conclusions would need more evidence. No experiment is required.

Curriculum reference: NGSS 5-PS1, Matter and Its Interactions. Science background: American Chemical Society, Inquiry in Action.

Talk through the evidence

1. Which factor changes in our trial?

Expected answer: Water temperature

Reasoning: A fair comparison changes one chosen factor while keeping other relevant conditions alike. Repeated trials make results more useful.

2. Which should stay equal?

Expected answer: Material amount and water volume

Reasoning: Our plan compares equal amounts of the same material in equal water volumes. A is warm and B is cool, so water temperature is the chosen difference. No rate results are supplied: the plan identifies the conditions, not which trial is faster.

3. Why repeat trials?

Expected answer: To check consistency

Reasoning: A fair comparison changes one chosen factor while keeping other relevant conditions alike. Repeated trials make results more useful.

4. What can this plan establish before results are recorded?

Expected answer: Which conditions are being compared

Reasoning: Our plan compares equal amounts of the same material in equal water volumes. A is warm and B is cool, so water temperature is the chosen difference. No rate results are supplied: the plan identifies the conditions, not which trial is faster.

Guide the discussion

Ask learners to point to the matching evidence on page 2. Distinguish an observation, supplied substance information, and an unsupported claim.

Online rewards: one fixed digital Expedition Discovery for this lesson. Five saved digital friends become available after all six distinct Chemistry lessons. Digital rewards do not establish physical ownership.