

Planning a fair test

Autumn 1 · Week 5 · Lesson A · 40 minutes

Learning objective

Identify independent, dependent and control variables, plan repeated measurements with units and explain fair handling of unexpected results.

Source lesson timing

Elapsed minutes	Source stage	Minutes
0–1	Title	1
1–5	Arrival Task	4
5–7	Today at a Glance	2
7–16	I Do 1	9
16–26	We Do 1	10
26–30	I Do 2	4
30–40	We Do 2	10

Split slide times are added within their original source stages. Printed tasks and adaptations replace activity within these timings; they do not add extra lesson time.

Equipment and preparation

- Adult-secured low ramp, same small trolley, two level run-out samples and padded stop for demonstration
- Ruler/tape with visible zero and fixed measuring edge
- Paper planning frames or local editable documents; card labels optional

TEACHING SEQUENCE

Guide the lesson

Use the source stage times; choose prompts appropriate to the pupil.

Title · 1 minute

Introduce planning a fair test and evaluating evidence.

Arrival Task · 4 minutes

Identify the deliberate change for trolley run-out surface question, and controls if ready.

Today at a Glance · 2 minutes

Name variables, plan three trials, judge evidence.

I Do 1 · 9 minutes

Model confounded surface-plus-push comparison, then repair to same no-push release and other controls.

We Do 1 · 10 minutes

Classify five variables and direct correction of a control/measuring zero.

I Do 2 · 4 minutes

Complete CHANGE/KEEP/MEASURE planning sentence before practical.

We Do 2 · 10 minutes

Sort method claims and distinguish surprising result from known method problem. Keep plan and stop.

TEACHER ANSWERS

Worked answers and expected evidence

Use after an attempt. Accept equivalent correct explanations; record support given.

Planning sentence

I will change the run-out surface, keep the same trolley and ramp/release arrangement, release without a push, and measure stopping distance from the same zero to the same edge in centimetres.

1. One question, clear variables

CHANGE: run-out surface. KEEP: same trolley, ramp height, release mark and no-push procedure; level samples, ramp join and measuring zero/edge also controlled. MEASURE: stopping distance in centimetres. The question concerns this setup, not every material under every condition.

2. Diagnose the adult demonstration

Surface and push/release changed. Difference could result from either or their combination, so surface effect cannot be isolated. Repair: keep same trolley, ramp, release mark and no-push release; change only level run-out surface and measure from same zero to same edge. If no demonstration occurred, identify scenario as hypothetical.

3. Classify the variable roles

Surface: CHANGE/independent. Stopping distance: MEASURE/dependent, cm. Ramp height, trolley and no-push release from mark: KEEP/control. Align actual zero marking, which may differ from ruler end, with agreed ramp-foot start; measure same trolley edge each time.

4. Sort and repair method claims

First: consistent with FAIR if other controls held. Second: NOT FAIR, two planned causes changed. Third: supports FAIR/consistency if method controlled but alone doesn't fix unfairness. Fourth: NOT SCIENCE/biased handling—keep disliked result and inspect method. Fifth: NOT A UNIT; use cm and actual zero. Accept precise explanation over memorised category.

5. Keep the evidence and the plan

Keep original result. Note observed extra push as specific method issue; if no cause known, retain uncertainty. Plan retry with controlled method, labelled separately. Complete sentence using surface, same trolley/ramp/release and distance in cm. Do not silently discard a value or treat a mean as a repair.

Misconceptions and corrections

- Fair means everyone gets a turn: in this investigation it means one planned change with relevant controls.
- Three repeats guarantee fairness: repetition does not remove a confounded method.
- A number without a unit is sufficient: distance record needs cm.
- Unexpected means incorrect: keep data and distinguish observation from known method issue.
- Source model WAGOLL proves carpet result: do not claim any material won before actual evidence.

Teach safely; keep the evidence

The source record identifies this conversion; it is not a claim of publication.

Safety

- Adult controls demonstration, clear run and small safe release; no pupil hard-push experiment.
- Keep hands clear, use stable low ramp and padded stop.
- Use a verbal/diagram scenario if safe kit unavailable; label it hypothetical.
- No oils, powders or unsafe floor-slip activity.

Access and offline alternatives

- Original editable variable map and paper/spoken sort replace animation and HTML controls.
- Keep planning and results together without requiring photographs or account uploads.
- Dictation, pointing and adult-directed demonstration give equivalent evidence of variable understanding.
- Source carpet conclusion is qualified to future actual evidence or named model data.

Close and continue

Monday ends after We Do 2, total 40 minutes. Tuesday conducts two-surface, three-trial investigation; do not perform a second unscheduled practical now.

Source and revision

Repository: [MattRoper1977/Lessons](https://github.com/MattRoper1977/Lessons)

Source path: [Science_Teesside/Grow/SCI_G_W5_Fair_Test.html](#)

Source file Git blob: [efdaeab196acc3a8a07e04b088c646ea3a8c724c](https://github.com/MattRoper1977/Lessons/blob/main/Science_Teesside/Grow/SCI_G_W5_Fair_Test.html)

Current source link (mutable): https://github.com/MattRoper1977/Lessons/blob/main/Science_Teesside/Grow/SCI_G_W5_Fair_Test.html

Document revision: 2026-09-06

Recorded conversion changes

- Current Monday stages retained; Tuesday's three-trial investigation is separate.
- Paper/spoken classification and editable variable map replace HTML interactions.
- A surprising result is distinguished from a known method problem; neither is silently deleted.
- Source WAGOLL changed from unobserved carpet claim to conditional/model-data wording.
- No external clips or publisher images copied; no logo substitute drawn.