

Run and judge a fair test

Autumn 1 · Week 5 · Lesson B · 40 minutes

Learning objective

Carry out or direct a controlled two-surface comparison, record three trials where practicable and judge whether evidence answers the question.

Source lesson timing

Elapsed minutes	Source stage	Minutes
0–32	Independent Work	32
32–36	Lundy Loop	4
36–40	Exit Ticket	4

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 trolley and two level run-out samples
- Tape/ruler, fixed release mark, measuring zero/edge and padded stop
- Monday plan and pupil results sheet; optional local spreadsheet for measurements
- Clearly labelled source invented data only for no-kit route

TEACHING SEQUENCE

Guide the lesson

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

Independent Work · 32 minutes

Return to question, plan and setup 7 min; three releases per surface and records 17 min; pause and check 2 min; retry concern, conclude and tidy 6 min. Means optional within final phase, not extra work or replacement for trials.

Lundy Loop · 4 minutes

Hear pupil observation/access feedback, agree a feasible change and explain limits.

Exit Ticket · 4 minutes

One appropriate route: one deliberate variable, one control or why repeats help. Attempt then check.

TEACHER ANSWERS

Worked answers and expected evidence

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

Model means and interpretation

A: $(48 + 50 + 49)/3 = 49$ cm. B: $(27 + 29 + 28)/3 = 28$ cm. Every B trial is shorter than every A trial, under the stated controlled setup. Describe greater resistance to rolling on B, not a direct numerical friction-force measurement or universal material law.

1. Confirm the plan

CHANGE: two named run-out surfaces. KEEP: same trolley, ramp height, release mark, no-push release, level run-out/ramp join, same zero and trolley edge. MEASURE: stopping distance in centimetres. Role can be tester, director, observer or recorder. Learner can interpret adult-recorded second surface without falsely claiming operation.

2. Record all three trials

Check named surfaces, actual values/units, three trials if performed, missing runs labelled honestly and original values retained. No fixed real-data values expected. Known pushed release is a method note, not automatic deletion. A separately labelled retry does not replace original record silently.

3. Alternative: model-data analysis

Every B distance 27/29/28 cm is below every A distance 48/50/49 cm. If same trolley, ramp/release, no push, zero and level setup were controlled, data support an effect of surface on stopping distance for this setup. A/B do not identify actual materials. Explicitly label supplied invented data; no experiment performed claimed.

4. Judge and explain the evidence

Real answer must match actual data; may be inconclusive. Model: A mean 49 cm, B mean 28 cm; B consistently shorter, supporting greater resistance to rolling under this stated setup, not direct friction-force measurement. Missing trials are not zero and no mean declared from incomplete three-trial set. Mean does not fix changed pushes or bias. Keep original and retry separately.

5. Feedback and exit

Feedback open; adult responds to feasible change and limits. One planned independent variable; controls same trolley, ramp height, release mark, no push or measuring zero; repeats show consistency/variation and help identify unusual results, so improve judgement of reliability. They do not guarantee truth or fix an unfair method.

Misconceptions and corrections

- Missing trial equals zero: record not performed and don't fabricate a complete mean.
- Average makes unfair method fair: a mean cannot remove confounding.
- All unusual results are errors: keep values, record known method issues and separate retries.
- Shorter trolley travel directly measures friction in N: stopping distance is comparative evidence, affected by rolling resistance and apparatus.
- Model data are pupil experiment: label source invented interpretation route explicitly.

Teach safely; keep the evidence

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

Safety

- Check stable low ramp, level samples and unchanged ramp join before release.
- Keep hands outside run; agree clear release/stop signal and no push.
- Use light trolley and padded stop; no racing or floor-slip activity.
- Offer observer/director/recorder roles or safe model-data interpretation.

Access and offline alternatives

- Supported learner may direct one surface and compare adult-recorded other surface.
- Paper, drawing, dictation and local XLSX are alternatives; no online account or upload needed.
- Model data are exact source values, with no invented surface identities or pupil observations.
- Means optional stretch; standard route can explain repeated values without averaging.

Close and continue

End Tuesday at 40 minutes: 7 plan + 17 trials + 2 check + 6 improve/tidy + 4 feedback + 4 exit. Keep the evidence together. The current Week 6 sequence explores Earth and the planets.

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](#)

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 Tuesday workshop phases remain 7 + 17 + 2 + 6 minutes, with 4-minute feedback and 4-minute exit.
- Three trials for each of two surfaces remain the practical; supported route may use adult-recorded second surface.
- Means are an optional stretch calculation, not a way to repair confounded methods or replace missing trials.
- Source invented teaching data are preserved as a separate clearly labelled interpretation alternative.
- Paper plans and editable tables replace browser controls; no publisher media or logo replacement.