



EduTrend Contents

P4C · SCIENCE AND WONDER · MIDDLE SCHOOL

What Makes Science Science?

Tests, predictions and Popper's idea of falsifiability

Ages 11–13

Level: Intermediate

50 minutes

Circle and small groups
· up to 30

Activity 03

Inside: activity at a glance · step-by-step session plan · facilitator notes · 3 student worksheets · assessment checklist

ACTIVITY 03 · AT A GLANCE

What Makes Science Science?

Students compare invented claims: “Plants grow faster with more light”, “Lucky socks help you win”, “Something good will happen to you this week” and “Water boils at 100°C at sea level.” For each, they ask what test could show it is wrong. They meet Karl Popper’s idea that scientific claims must be testable and could in principle be shown false. They enquire into what makes science science.

Learning outcomes

By the end of the session students can:

- distinguish testable and untestable claims;
- explain falsifiability;
- evaluate claims;
- reach a justified view.

KEY WORDS

test · predict · falsifiable · Popper · evidence · claim

CURRICULUM LINKS

Science: working scientifically.
PSHE: horoscopes and superstitions. English: persuasive claims.

1**STIMULUS**

Share something to think about

2**THINK**

Quiet thinking time

3**QUESTION**

Create and choose a question

4**ENQUIRE**

Reason together

5**BUILD**

Agree, disagree, add

6**REFLECT**

Last words

Materials (per class)

- Claim cards
- Test planning sheet
- Question and thinking-move cards
- Worksheets 1, 2 and 3

Before the session

- Read the stimulus and note possible concepts.
- Prepare question and thinking-move cards.
- Set out a circle so everyone can see each other.
- Print the worksheets.

SAFETY

Everyone may pass. Discuss ideas, not people, and use the story or invented examples rather than personal situations.

ACTIVITY 03 · SESSION PLAN

Step by step

Stay neutral: ask for reasons, examples and counter-examples rather than giving your own view.

Time	What happens	Say or ask
0–8 min Stimulus	Share the claim cards and ask how each could be tested.	<i>"What did you notice?"</i>
8–20 min Questions	Students create questions in pairs and vote on one.	<i>"Which question is most interesting to talk about?"</i>
20–44 min Enquiry	Enquire into the chosen question, building on each other's ideas.	<i>"What makes science science?"</i>
44–50 min Last words	Each person says one last thought or passes.	<i>"Has your thinking changed?"</i>

CHALLENGE CARD (print or copy onto the board)

Explain what makes one claim scientific and another not.

ACTIVITY 03 · FACILITATOR NOTES

The philosophy in brief

Karl Popper argued that a theory is scientific if it makes predictions that could be shown false by observation.

Philosophers of science have also criticised and developed Popper's view.

Common ideas to listen for

- "Science proves things with total certainty." Theories can be revised.
- "Untestable claims are always false." They are just not scientific.
- "Anything with numbers is science." Testability matters.

Adapting the activity

Support

Compare two claims.

Stretch

Design a fair test for one claim.

WORKSHEET 1

Our questions

Name: _____

Class: _____ Date: _____

Write questions the stimulus makes you wonder about.

Our questions

Question	Who asked	Votes

WORKSHEET 2

Can it be tested?

Analyse.

Can it be tested?

Claim	Test that could prove it wrong	Scientific?

WORKSHEET 3

Last words

Before and after.

Can a claim that could never be proved wrong be scientific? Before the enquiry I thought... Now I think... because...

FOR THE TEACHER

Assessment checklist

Use during the session. One sheet covers up to eight students; copy as needed.

Student	Asks a philosophical question	Gives reasons and examples	Listens and builds on others

Suggested codes: W = working towards · E = expected · G = greater depth

ABOUT THIS ACTIVITY

What Makes Science Science? is a sample activity from the EduTrend Contents P4C Science and Wonder programme (middle school, level: intermediate). Every activity in the programme follows the same format: a practical challenge, a clear session plan, facilitator notes and ready-to-print worksheets, so that teachers, club leaders and parents can run it without extra preparation.

Full 15-, 20- and 32-week programmes are available from EduStore at edutrend.org.

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