



EduTrend Contents

EDUTECH · ENGINEERING · PRIMARY

Paper Bridge Challenge

Span a gap with paper and hold as many coins as possible

Ages 9–11

Level: Developing

2 × 45 minutes

Groups of 3 · up to 30

Activity 02

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

ACTIVITY 02 · AT A GLANCE

Paper Bridge Challenge

Groups of three get ten sheets of A4 paper and a metre of tape to build a bridge across a 25 cm gap between two stacks of books. They sketch two ideas, build and load the bridge with coins until it fails, record where it failed, borrow ideas from other groups and rebuild with the same materials.

Learning outcomes

By the end of the session pupils can:

- design within constraints;
- test to failure and record results;
- explain why shape affects strength;
- improve a design using evidence.

KEY WORDS

span · load · beam · fold · failure · redesign

CURRICULUM LINKS

Maths: counting and measuring.
Science: forces. History: famous bridges.

1**ASK**

Who needs what?

2**IMAGINE**

Many ideas

3**PLAN**

Sketch and choose

4**BUILD**

Make a prototype

5**TEST**

Measure against
criteria

6**IMPROVE**

Redesign and
retest

Materials (per group)

- 10 sheets of A4 paper
- 1 m of masking tape
- Books for supports
- Coins or washers
- Worksheets 1, 2 and 3

Before the session

- Set book stacks 25 cm apart.
- Count coins into cups.
- Pre-cut tape.
- Print worksheets.

SAFETY

Coins are small: keep them away from younger children. Stack books securely.

ACTIVITY 02 · SESSION PLAN

Step by step

Folding paper into corrugations or tubes makes a huge difference; let pupils discover it.

Time	What happens	Say or ask
Lesson 1: 0–10 min Challenge	Explain the task.	<i>“How can flat paper be strong?”</i>
10–20 min Imagine	Sketch two ideas.	<i>“Which will hold more?”</i>
20–45 min Build and test	Load until failure.	<i>“Where did it fail?”</i>
Lesson 2: 0–15 min Share	Gallery of ideas.	<i>“What will you borrow?”</i>
15–45 min Rebuild	Rebuild and retest.	<i>“What changed and why?”</i>

CHALLENGE CARD (print or copy onto the board)

Build a paper bridge across a 25 cm gap, test it with coins, identify how it failed and rebuild it to hold more.

ACTIVITY 02 · FACILITATOR NOTES

The engineering know-how in brief

A flat sheet of paper bends easily. Folding it into corrugations, tubes or triangles increases stiffness, because more material is placed further from the middle of the beam.

Testing to failure shows the weakest point. Engineers record how and where a structure fails so the next design can strengthen that part.

Common ideas to listen for

- “Paper is too weak to build with.” Shape makes it strong.
- “The bridge that failed was bad.” It gave useful evidence.
- “Heavier bridges are stronger.” Shape matters more than mass.

Adapting the activity

Support

Show a folded fan as a hint.

Stretch

Calculate coins held per gram of bridge.

WORKSHEET 1

Design ideas

Name: _____

Class: _____ Date: _____

Sketch two ideas.

Design ideas

Idea	Sketch notes	Prediction (coins)
1		
2		

WORKSHEET 2

Test log

Record each test.

Test log

Test	Coins held	Where it failed
1		
2		

WORKSHEET 3

Explain the change

What made it stronger?

Our explanation

FOR THE TEACHER

Assessment checklist

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

Pupil	Designs within constraints	Records failure	Explains improvement

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

ABOUT THIS ACTIVITY

Paper Bridge Challenge is a sample activity from the EduTrend Contents Edutech Engineering programme (primary, level: developing). 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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