



EduTrend Contents

G4C · SCIENCE AND EXPERIMENTATION GAMES · MIDDLE SCHOOL

Foil Boat Challenge

Design a foil boat that holds the most coins, test it, improve it and explain what made the difference

Ages 11–13

Level: Intermediate

40 minutes

Pairs · 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

Foil Boat Challenge

Each pair gets one square of foil and shapes a boat. They predict how many coins it will hold, then add coins one at a time until it sinks, recording the total. Pairs study the best designs in the room, redesign their own and test again. They explain which features, such as a wide flat base or higher sides, made the difference.

Learning outcomes

By the end of the session students can:

- predict and test a design;
- record results;
- improve a design using evidence;
- explain the science simply.

KEY WORDS

predict · design · test · buoyancy · surface area · improve

CURRICULUM LINKS

Science: floating and sinking.
Design and technology: iterative design.

1

WONDER
Ask a question

2

PREDICT
Commit to a guess

3

TEST
Try it safely

4

RECORD
Write it down

5

EXPLAIN
Why did it happen?

6

TIDY
Clear up and wash hands

Materials (per pair)

- Foil squares of equal size
- Tub of water and towels
- Coins or washers
- Worksheets 1, 2 and 3

Before the session

- Cut equal foil squares.
- Fill tubs.
- Count coins.
- Model a test.

SAFETY

Supervise water and wipe spills at once. Wash hands after handling coins.

ACTIVITY 03 · SESSION PLAN

Step by step

Equal foil squares make the comparison fair.

Time	What happens	Say or ask
0–5 min Wonder	How do heavy ships float?	<i>“What might help a boat hold more?”</i>
5–10 min Predict	Design and predict.	<i>“How many coins?”</i>
10–32 min Test	Test, study others, redesign.	<i>“What will you change?”</i>
32–40 min Explain	Compare and explain.	<i>“What made the biggest difference?”</i>

CHALLENGE CARD (print or copy onto the board)

Improve your boat’s coin total in the second test and explain why it worked.

ACTIVITY 03 • FACILITATOR NOTES

The science game know-how in brief

Committing to a prediction makes results matter.

Comparing designs with the same foil keeps the test fair.

Common ideas to listen for

- “Heavy things can’t float.” Shape changes how much water is pushed aside.
- “A tall boat is best.” Base area often matters more.
- “The first design is enough.” Testing shows how to improve.

Adapting the activity

Support

Show three example shapes to start from.

Stretch

Keep the coin total high while using a smaller foil square.

WORKSHEET 1

Design and predict

Name: _____

Class: _____ Date: _____

Sketch and predict.

Design

Test	Sketch notes	Predicted coins	Actual coins
1			
2			

WORKSHEET 2

Best designs

Record features of the best boats.

Features

WORKSHEET 3

Reflection

Reflect.

Our boat held more because...

FOR THE TEACHER

Assessment checklist

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

Student	Predicts	Improves with evidence	Explains results

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

ABOUT THIS ACTIVITY

Foil Boat Challenge is a sample activity from the EduTrend Contents G4C Science and Experimentation Games 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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