



EduTrend Contents

EDUTECH · ROBOTICS COMPETITIONS AND CHALLENGES · MIDDLE SCHOOL

The Engineering Notebook

Document design decisions the way competition judges expect

Ages 12–14

Level: Intermediate

60 minutes

Teams of 3 · up to 30

Activity 04

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

ACTIVITY 04 · AT A GLANCE

The Engineering Notebook

Teams study what makes a strong engineering notebook: dated entries, sketches, options considered, decisions with reasons, test data and changes. They document a small design change to their robot, such as a new attachment, then present their notebook page to a mock judge and answer questions.

Learning outcomes

By the end of the session students can:

- record design decisions;
- include test data;
- explain changes with reasons;
- present to a judge.

KEY WORDS

engineering notebook · decision · evidence · test data · iteration · judge

CURRICULUM LINKS

English: technical writing. Science: recording evidence. D&T: design portfolios.

1**SENSE**

What can it detect?

2**THINK**

What should it decide?

3**ACT**

What should it do?

4**TEST**

Run it

5**DEBUG**

Find and fix

6**IMPROVE**

Make it better

Materials (per team)

- Notebooks
- Robot kits
- Example notebook pages
- Judge question cards
- Worksheets 1, 2 and 3

Before the session

- Prepare example pages (good and weak).
- Print judge questions.
- Check kits.
- Print worksheets.

SAFETY

Keep robots in the test area. Tidy parts when finished.

ACTIVITY 04 · SESSION PLAN

Step by step

Most competition programmes value process: notebooks, presentations and teamwork often carry real weight.

Time	What happens	Say or ask
0–10 min Compare	Good and weak notebook pages.	<i>“What makes it useful?”</i>
10–35 min Document	Design, test and record a change.	<i>“Why did you choose that?”</i>
35–45 min Data	Add test results.	<i>“What does the data show?”</i>
45–55 min Judge	Present to a mock judge.	<i>“Can you explain every part?”</i>
55–60 min Reflect	Improve entries.	<i>“What was missing?”</i>

CHALLENGE CARD (print or copy onto the board)

Document a robot design change with options, decisions, test data and reasons, and explain it clearly to a mock judge.

ACTIVITY 04 · FACILITATOR NOTES

The competition know-how in brief

An engineering notebook records how a design developed: problems, ideas, choices, tests and changes. It shows judges the team's thinking, not just the final robot.

Good entries are dated, include sketches and data, and explain why decisions were made. Students should be able to explain every part of their robot to a judge.

Common ideas to listen for

- "The notebook is just for neatness." It shows thinking.
- "Only record successes." Failures show learning.
- "Judges only watch the robot." They ask about process.

Adapting the activity

Support

Provide a page template.

Stretch

Add a decision matrix comparing options.

WORKSHEET 1

Notebook entry

Name: _____

Class: _____ Date: _____

Plan your page.

Notebook entry

Section	Our notes
Problem	
Options	
Decision and reason	
Test data	
Change	

WORKSHEET 2

Test data

Record tests.

Test data

Test	Before change	After change
1		
2		
3		

WORKSHEET 3

Judge questions

Prepare answers.

How we would explain our design to a judge

FOR THE TEACHER

Assessment checklist

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

Student	Records decisions	Uses data	Explains clearly

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

ABOUT THIS ACTIVITY

The Engineering Notebook is a sample activity from the EduTrend Contents Edutech Robotics Competitions and Challenges 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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