



EduTrend Contents

EDUTECH · STEM RESOURCES FOR STUDENTS · HIGH SCHOOL

Self-Directed STEM Project

Choose a question, pick resources and plan an independent project

Ages 15–18

Level: Advanced

75 minutes

Individual · up to 30

Activity 05

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

ACTIVITY 05 · AT A GLANCE

Self-Directed STEM Project

Students brainstorm STEM questions that interest them, narrow one into a focused, achievable project, and choose trusted resources such as simulations, open data, coding guides or problem sites. They plan weekly milestones, decide what evidence will show progress and get feedback from a peer.

Learning outcomes

By the end of the session students can:

- narrow a question into a project;
- evaluate and choose resources;
- plan milestones and evidence;
- give and use peer feedback.

KEY WORDS

project · question · milestone · resource · evidence · reflection

CURRICULUM LINKS

All STEM subjects. English: proposals. PSHE: self-management.

1**GOAL**

Set a small goal

2**QUESTION**

What do I want to know?

3**EXPLORE**

Use a trusted resource

4**MAKE**

Build, solve or record

5**EXPLAIN**

Tell someone

6**REFLECT**

What next?

Materials (per student)

- Device with a browser
- Project planning template
- Resource evaluation checklist
- Worksheets 1, 2 and 3

Before the session

- Prepare example projects.
- Print templates.
- Share a list of trusted resources.
- Print worksheets.

SAFETY

Any practical work needs a teacher-approved risk assessment. Use trusted sites only.

ACTIVITY 05 · SESSION PLAN

Step by step

Most first ideas are too big; spend time narrowing the question.

Time	What happens	Say or ask
0–12 min Brainstorm	List questions.	<i>“What are you curious about?”</i>
12–25 min Narrow	Make it focused.	<i>“Can you finish it in six weeks?”</i>
25–40 min Resources	Find and evaluate.	<i>“Who made it and why?”</i>
40–60 min Plan	Milestones and evidence.	<i>“How will you show progress?”</i>
60–75 min Feedback	Peer review.	<i>“What would make it stronger?”</i>

CHALLENGE CARD (print or copy onto the board)

Write a six-week independent STEM project plan with a focused question, evaluated resources, milestones and evidence of progress.

ACTIVITY 05 · FACILITATOR NOTES

The learning know-how in brief

Self-regulated learners plan, monitor and evaluate their own learning. Guidance from the Education Endowment Foundation (2018) highlights explicitly teaching these metacognitive strategies.

A good project question is focused, answerable with available resources and matched to the time available. Milestones and evidence make progress visible.

Common ideas to listen for

- “Bigger projects are better.” Focused ones get finished.
- “Any resource will do.” Evaluate reliability.
- “Planning wastes time.” It saves time later.

Adapting the activity

Support

Choose from a list of starter questions.

Stretch

Plan how to share results with a real audience.

WORKSHEET 1

Narrowing

Name: _____

Class: _____ Date: _____

From big idea to project.

Narrowing

Stage	My version
Big idea	
Narrower	
Focused question	

WORKSHEET 2

Milestones

Plan six weeks.

Milestones

Week	Milestone	Evidence
1		
2		
3		
4		
5		
6		

WORKSHEET 3

Peer feedback

Record and respond.

Feedback received and what I will change

FOR THE TEACHER

Assessment checklist

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

Student	Focuses question	Evaluates resources	Plans milestones

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

ABOUT THIS ACTIVITY

Self-Directed STEM Project is a sample activity from the EduTrend Contents Edutech STEM Resources for Students programme (high school, level: advanced). 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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