

Choosing Your Theme and Brainstorming Ideas

80 minutes (2 periods)

Coursework Project Preparation

Outcome 1.1

Outcome 1.3

Outcome 1.19

Outcome 1.21

Outcome 1.23

WHAT THIS LESSON DOES

Please note: this module follows the 2026 project brief, whose theme was forests. The State Examinations Commission publishes a new brief each year, with its own theme and its own dates. These lessons will be updated once this year's brief is published. Check the current brief on the SEC website before you begin. In this lesson, you will select a focused theme on forests and their environmental impacts, such as climate or wildfire risk. You will identify a real-world process to simulate using an embedded system, choose at least one digital and one analogue input plus an output, brainstorm ideas in a document, share with a partner, and finalise a project title.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
1.1	describe a systematic process for solving problems and making decisions
1.3	solve problems by deconstructing them into smaller units using a systematic approach in an iterative fashion
1.19	identify features of both staged and iterative design and development processes
1.21	identify alternative perspectives, considering different disciplines, stakeholders and end users
1.23	reflect and communicate on the design and development process

WHAT STUDENTS SHOULD BE ABLE TO DO

- Select a focused theme linking forests to environmental influences such as climate, biodiversity, or wildfire risk.
- Identify a real-world process suitable for simulation using an embedded system.
- Specify essential inputs and outputs for the embedded system, including digital and analogue components.
- Develop a project idea that adheres to basic requirements and explores advanced modelling options.
- Document and refine project concepts through individual brainstorming and peer collaboration.

BEFORE THE LESSON

- Have the exact wording of the forests coursework brief on screen so students can quote the basic requirements accurately.
- Confirm which boards and sensors your room actually holds (Pico, micro:bit v2, DHT22, soil moisture, smoke) so ideas stay feasible against real kit, not the example table.
- Make sure students can create and save a document named 'My 2026 Project Ideas' to a location that persists between lessons.

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HOW THE LESSON RUNS

Lesson Objectives

The Big Theme: Forests and Their Challenges

Feasible Project Ideas Directly Based on the Brief

Required Inputs and Outputs

Individual Brainstorming Activity

Pair & Share

Finalise Your Project Title

Checklist Before the Next Lesson

TEACHING MOVES

- 2. The Big Theme: Forests and Their Challenges. Read the brief aloud and stress the one non-negotiable: every part of the project must connect clearly to forests. Have students name which sub-area they are drawn to before any hardware talk.
- 3. Feasible Project Ideas Directly Based on the Brief. Use the table as a spark, not a menu. Point out each row already carries a digital input, an analogue input and an output, so students can reverse-engineer why those ideas satisfy the brief.
- 4. Required Inputs and Outputs. Make students distinguish digital from analogue with a concrete example: a rain sensor gives on or off, a soil moisture sensor gives a range. Insist they choose at least one of each before moving on.
- 5. Individual Brainstorming Activity. Circulate while they fill the table. Push any student stuck on one clever idea to write two 'what-if' scenarios, this is where feasibility problems surface early.
- 6. Pair & Share. Structure the pairing: each partner must confirm the other meets all three basic requirements before suggesting an improvement. Have them add the suggestion in writing, not just discuss it.
- 7. Finalise Your Project Title. Ask for a title that names the process and the sensors, like the examples given. A vague title now signals a vague scope later.
- 8. Checklist Before the Next Lesson. Run the checklist as an exit check. The line that catches most students is 'no off-theme elements', so ask each to justify how every component links to forests.

WHAT TO WATCH FOR

- Students think any environmental sensor project qualifies, missing that everything must tie explicitly to forests. Ask them to finish the sentence 'This matters for forests because...'. If they cannot, the idea drifts off-theme and needs reframing.
- Confusing digital and analogue inputs, or listing two of the same type and thinking the requirement is met. Have them label each chosen sensor: does it report a single on/off state or a value across a range? Confirm they have at least one of each before pairing.
- Choosing an idea that cannot run autonomously, expecting to press buttons throughout the simulation. Remind them the system may be calibrated at start but must then run by itself. Ask what happens once they walk away from the board.

DIFFERENTIATION

- Emerging: Give the student one row of the example table and ask them to adapt just the theme, keeping the input and output structure as a scaffold. Pair them with a student who has a firm idea so the pair-and-share becomes a modelling opportunity.