

Mini Engine Contraption Creators with Susan

Instructions:

Check out this sample lesson plan and activity ideas for inspiration, ideas, and more. Feel free to edit, delete, or highlight to make it your own! These notes are yours to customize. They will not be published anywhere such that you're held to teaching exactly what's here.

Topics

Problem solving while building

Lesson Ideas

Lesson Title

Build Contraptions With a Small Engine

Duration

1 hour

Lesson Plan

1. Introduction (10 minutes)

- Introduce the concept of contraptions and small engines.
- Discuss real-world applications and how innovations solve problems.

2. Exploring Small Engines (10 minutes)

- Briefly demonstrate and explain how small engines work.
- Show examples of simple contraptions that use similar engines.

3. Planning the Contraption (10 minutes)

- Brainstorm ideas and plan a simple contraption in small groups.

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- Focus on a problem the contraption will solve.

4. Building Phase (20 minutes)

- Use materials provided to construct the contraption.
- Guide students to connect the small engine to their design.

5. Problem Solving and Troubleshooting (5 minutes)

- Encourage students to identify and solve any issues with their build.
- Facilitate discussion on possible improvements.

6. Presentation and Reflection (5 minutes)

- Groups present their contraptions and explain their problem-solving process.
- Reflect on what was learned and discuss ideas for future builds.

Materials List

- Small battery-powered engines
- Cardboard, plastic containers, and other recycled materials
- Scissors and adhesive tape
- Rubber bands and string
- Optional: wheels, axles, gears

Adaptations for Different Ages

- Younger children: Pre-assemble some parts, use simple kits.
- Older children: Encourage more complex designs and include gear mechanics.

Movement Break

- Midway through the lesson, include a 5-minute break with simple stretches and jumping jacks to refresh the students.

Bonus Activities

- Set up a challenge for building a contraption that moves a specific distance.
- Organize a mini competition for the most creative and functional contraption.

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Series Outline

****Week 1: Introduction to Small Engines****

- Explain how small engines work with a basic diagram.
- Showcase various common contraptions that use small engines.
- Discuss safety tips and the importance of following guidelines when handling engines.

****Week 2: Understanding Engine Components****

- Disassemble a model engine in small groups and identify individual parts.
- Use charts and diagrams to visualize how engine parts interconnect.
- Create a labeled display board of engine components.

****Week 3: Basic Engine Mechanics****

- Conduct a demonstration on how to start and stop a small engine safely.
- Explore engine cycle (intake, compression, power, exhaust) with animations.
- Perform hands-on activities showing simple gear and pulley systems.

****Week 4: Problem Solving While Building****

- Present a common engine problem and brainstorm solutions in teams.
- Engage in a workshop to troubleshoot minor engine issues (e.g., spark plug cleaning).
- Create and solve engine-related brain teasers or puzzles.

****Week 5: Building a Basic Contraption****

- Work in pairs to design a simple vehicle powered by a small engine.
- Guide students through attaching the engine to the contraption securely.
- Conduct test runs and iteratively improve designs based on performance.

****Week 6: Energy and Efficiency****

- Set up experiments to measure how engines use fuel to produce power.
- Host a discussion on energy efficiency and its importance in modern engineering.
- Play an engine efficiency-themed game to reinforce learning.

****Week 7: Creativity and Innovation****

- Use a brainstorming session to invent new contraptions featuring small engines.
- Sketch and present innovative ideas to the class for feedback.
- Encourage building prototypes of creative contraptions.

****Week 8: Working with Limitations****

- Challenge students to build functional contraptions using limited resources.

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- Reflect on historical innovations constrained by technology or resources.
- Host a mock "contraption showcase" to display solutions.

****Week 9: Teamwork and Collaboration****

- Assign a group project to design or improve an existing contraption.
- Practice effective communication and role distribution within teams.
- Set goals and milestones for project completion.

****Week 10: Final Presentation and Reflection****

- Host a showcase event for students to present their final contraptions.
- Encourage peer reviews and constructive feedback sessions.
- Reflect on the learning process and discuss what was most enjoyable or challenging.

For additional support, reference this [experience outline template](#) which includes tips and prompts to help you develop and lead an excellent Grasshopper Kids experience.

Note: This lesson plan outline was drafted by Hopper. If you would like to see different results, you can [submit another idea](#), or text us with feedback so we can work to make the algorithm better. We built this tool to help save you time in bringing more kids enrichment experience ideas to life!

