

Lesson Plan: Tinkering Relays — Pen Challenge

Grade Levels: K-2, 3-5, 6-8 (standards aligned below)

Time Suggestion: 15-30 minutes

Lesson Objectives:

- Students will collaboratively disassemble and reassemble a simple mechanical object (a pen) through team relay activities.
 - Students will develop communication and teamwork skills by working under time pressure.
 - Students will reflect on the importance of clear communication, encouragement, and collaboration during problem-solving tasks.
 - Students will observe and discuss basic mechanical design and function of everyday objects.
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Materials Needed:

- One simple ballpoint pen per team (no permanent markers or pens that can't be safely taken apart)
 - Stopwatch or timer
 - Workspace for each team
 - Whiteboard or chart paper for reflection discussion
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Lesson Outline:

1. Introduction (5-10 minutes)

- Briefly introduce the activity and show an example pen.
- Explain the rules: Each team will work in a relay to take apart and put together the pen.
- Emphasize safety and care in handling parts.

2. Team Formation (5 minutes)

- Divide students into teams of about four.
Assign roles in sequence: Person 1 starts by taking apart the pen; Person 2 puts it back together; Person 3 takes it apart again; Person 4 reassembles it to finish.
- Remind them only one person works at a time, then tags the next person.

3. Relay Activity (10-15 minutes)

- Start the timer.
- Teams perform the relay, working quickly but carefully.
- The first team to successfully reassemble the pen wins!

4. Group Discussion and Reflection (10-15 minutes)

- Ask: What helped your team work well?
- Was it helpful to have someone encouraging or giving instructions?
- What challenges did you face?



- How did you solve problems together?
- Discuss the mechanics of the pen — how do the parts work?

5. Wrap-Up (5 minutes)

- Highlight teamwork and communication as key to success.
- Encourage students to think about how tinkering helps inventors and engineers improve designs.

Suggested Standards Alignment:

Grade Band	Standards (Examples)
K-2	NGSS: K-2-ETS1-1: Ask questions, make observations, and gather information to define a simple problem. SEL: CASEL Competency: Relationship Skills—cooperation and communication.
3-5	NGSS: 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem. SEL: CASEL Competency: Social Awareness—considering others' perspectives in teamwork.
6-8	NGSS: MS-ETS1-3: Analyze data from tests to determine similarities and differences among several design solutions. SEL: CASEL Competency: Responsible Decision-Making—working together to solve problems effectively.