

ClawCADE STEM Lesson Plans

1. Elementary (Grades 2–5)

Theme: “ Machines Make Fun! ”

Duration: 45–60 minutes

Learning Objectives:

- Understand that machines use parts (gears, motors, claws) to do work.
- Practice estimation and simple probability.
- Connect arcade games to real-world science concepts (forces and movement).

Lesson Flow:

1. Introduction – Show coloring page, brainstorm how claw works.
2. Guided Activity – Complete worksheet, practice estimation.
3. Hands-On Demo – Use grabber/tongs to simulate claw.
4. Wrap-Up – Discuss improvements, draw ideas.

2. Intermediate (Grades 6–8)

Theme: “ Probability, Force, and Engineering in Action ”

Duration: 60 minutes

Learning Objectives:

- Calculate probability using fractions and percentages.
- Explore how force and grip strength affect outcomes.
- Apply the engineering design process to suggest improvements.

Lesson Flow:

1. Engage – Discuss luck vs skill.
2. Explore – Record data and calculate success rates.
3. Explain – Learn about force and grip strength.
4. Engineering Challenge – Brainstorm design improvements.
5. Wrap-Up – Connect to STEM careers.

3. High School (Grades 9–12)

Theme: “ STEM Behind the Claw: Physics, Engineering & Data ”

Duration: 75 minutes

Learning Objectives:

- Apply probability and data analysis to real-world systems.
- Understand torque, friction, and mechanical advantage.
- Connect sensors, circuits, and programming to arcade machines.

- Use the engineering design process to create solutions.

Lesson Flow:

1. Introduction – Discuss why claws drop prizes.
2. Experiment – Collect and graph probability data.
3. Physics Connection – Torque, friction, and grip force.
4. Technology & Engineering – Sensors, circuits, programming.
5. Wrap-Up – Relate to robotics, engineering, and real-world careers.