

SMART LAB ACTIVITY GUIDE

PUPPET SHOW

DESIGN CHALLENGE

Create a robotic puppet show.

DIFFICULTY LEVEL

Medium – advanced building, programming and performance

MATERIALS

LEGO MINDSTORMS EV3 kit

Tape, markers, cardboard, paper, scissors, string, etc.

A few weeks before the activity, start collecting materials that students might need

SMART LAB DISCIPLINES

Science Mechanics	Math Calculations related to timing/syncing puppets	Art Performance	Technology & Engineering Automation
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STUDENT OUTCOMES

- **Creativity:** student build creative problem solving skills
- **Critical thinking:** students learn how to make reasoned judgments about how to program, build and design their puppet show in order to turn ideas into feasible designs
- **Use of different materials:** students learn to incorporate different materials and how different material properties can support their design

DETAILED OBJECTIVE

- Create a story/theme for your puppet show
- Create a robotic puppet(s) that moves and uses at least one sensor
- Add in any necessary background, art, script, additional actors, etc.

EXAMPLE SESSION 1

This activity is expected to take up two sessions.

Introduction: 10 minutes

Put students into small groups (preferably groups of two)
Explain the design challenge, detailed objectives, and available materials
Show students examples of other puppet shows

Encourage students to follow the engineering design process, by:

Brainstorming: 20 min

Have students brainstorm ideas for a story/theme for their puppet show
Have students share their ideas from their group brainstorm with the class and discuss feasibility of their ideas

Build, test & evaluate, and refine: 40 minutes

Give students time to work on building and programming their robot
Encourage students to test, evaluate and then refine their design by re-identifying the problem, brainstorming additional ideas, modifying their solution, or re-testing & re-evaluating.

Present: 10 minutes

Have students present their works-in-progress

Share: 15 minutes

Groups should take videos and/or pictures of their works in progress and post the video/pictures and a short description of their puppet show to the website.

EXAMPLE SESSION 2

Build, test & evaluate, and refine: 50 minutes

Students should continue to work on their project.
Encourage students to test, evaluate and then refine their design by re-identifying the problem, brainstorming additional ideas, modifying their solution, or re-testing & re-evaluating.

Present: 20 minutes

Have students present their designs

Share: 20 minutes

Groups should take videos of their puppet show and post the video and a short description of their puppet show to the website.

EXAMPLE SOLUTIONS



