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Intro to Engineering

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Time: 1 one-hour class period

Description: In this activity, students will be introduced to engineering and partner building. Students will work with a partner to build a design of their choice, but must cooperate, discuss, and compromise as part of the challenge.

Grade Level:

- K-3

Lesson Objectives:

- Introduce engineering and what an engineer does
- Assist students in their ability to work with others
- For students to learn how to plan, share, and discuss ideas for building a simple structure.

Materials Needed:

- 20 LEGO pieces in a small plastic bag (one for each pair)
- *Optional* - [What Do Engineers Do](#) book (available at Tufts CEEO)
- *Optional* - books about sharing a [Dandelion Wars](#) or [It's](#) by Leo Lionni

For the extensions

- Extension LEGO kits (10 pieces in a bag for each student)
- Mystery number of LEGO pieces in a bag for students to count and name
- Mystery pieces students must identify by feel

Preparation and Setup:

1. Arrange students in pairs

2. Distribute LEGO kits
3. Distribute 'Engineer's Planning Worksheets'

Teacher Background: To properly refer to LEGO bricks, plates and beams of different sizes count the number of bumps on top of the brick/plate/beam widthwise by lengthwise. A 1 x 4 beam is 1 ridge wide and 4 ridges long. A 2 X 8 brick is 2 bumps wide and 8 bumps long.

Vocabulary:

- Compromise
- Share
- Respect
- Cooperate
- Evaluate

Piece Names:

- Brick
- Beam
- Plate

Procedure:

1. Introduce what engineering is and what engineers do, you may want to use picture representations, books, or examples.
 2. Introduce to the class that they will be exploring engineering through LEGOs
 3. Talk about the importance of teamwork, sharing and cooperation in engineering and discuss how students might work together by planning, compromising and taking turns.
 4. Introduce the pieces students will be using in this activity (brick, beam, and plate) and how to name each one and each size (e.g. 2 X 4 Brick).
 1. You may want to create a worksheet to enforce the naming system.
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2. Introduce the challenge -- Tell students that they must use their bag of 20 LEGO pieces to build a structure with their partner. Before you distribute LEGOs, have students plan using their Engineer's Planning Worksheet (attached to activity).
 3. When students have finished, come together as a class. Let each student share their design, one thing they like about it and one problem they had. Ask students how they worked cooperatively with their partners.

Curriculum Standards:

This activity meets the Massachusetts Frameworks Learning Standards for Technology and Engineering

Grades K - 2

1.3 Identify and describe the safe and proper use of tools and materials to construct simple structures.

Extensions:

- Give each student 10 identical pieces. In pairs, have one student build a structure and the other student copy the structure with his or her pieces.
- Give students a bag with a mystery number of pieces and have them count and name the pieces.
- Place a piece in a paper bag, box, or something else where the students can't see the piece. Have them take turns guessing what piece is inside by feeling it.

Modifications:

If students are having trouble working together, role model and discuss the following situations with another adult:

- grabbing pieces
- Working on separate projects without communicating
- Arguing

References:

Assessment:

Engineering Planning Sheet

Student Presentations of designs

Sample Images:

Downloads:



Filename:

[planning_sheet.pdf](#)

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