

Mathematics: The Language of STEM
Extreme Makeover: Pig House Edition
Burden

CONTENT AND TASK DECISIONS

Grade Level(s): K

Description of the Task: Fairy Tale Engineering – 3 Pigs House

Students will test, design, and construct a scale house using given materials to withstand high wind as we simulate the “Big Bad Wolf”.

Indiana Mathematics Content Standards:

K.G.1 – Describe the positions of objects and geometric shapes in space using the terms inside, outside, between, above, below, near, far, under, over, up, down, behind, in front of, next to, to the left of and to the right of.

K.G.2 – Compare two- and three-dimensional shapes in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/”corners”) and other attributes (e.g., having sides of equal length).

K.G.3 – Model shapes in the world by composing shapes from objects (e.g., sticks and clay balls) and drawing shapes.

K.G.4 – Compose simple geometric shapes to form large shapes (e.g., create a rectangle composed to two triangles).

Indiana Mathematics Process Standards:

PS.1 – Make sense of problems and persevere in solving them.

PS.2 – Reason abstractly and quantitatively.

PS.4 – Model with mathematics.

PS.5 – Use appropriate tools strategically.

PS.7 – Look for and make use of structure.

Mathematics Content Goals:

Students will describe the relationships between materials used and how they are similar or different from one another.

Language Objectives:

Students will be introduced to and being to apply the vocabulary describing the position in space of materials as they compare to one another (location). In addition, students will explore descriptions that highlight how shapes are similar or different.

Materials:

Whatever resources available at school and those mentioned in the lesson preceding this lesson (written by Valerie Hutton).

THE LESSON

Before:

Students will be introduced to the story of the 3 Little Pigs by a read aloud in class. Much of the conversation will be centered around understanding what went wrong with the houses in the story.

Introduce new terms – structure and function. The prior knowledge will be accessed from a previous lesson that has students investigate materials that they have available around them. The investigation of materials to build with will then make transitioning into this lesson a smooth progression. Conversations will be about the materials they explored and how they can be manipulated.

Students will then review the events that took place in the 3 Little Pigs story. The focus will be on the failure of the first two pigs along with the success of the final pig. Their task is to design a house for the first and second pigs that would successfully withstand the force of the Big Bad Wolf using the materials around them. Similar to the characters in the story, they used resources that were available to them.

Students will record their thinking on planning sheets and label the different parts of the house as we discuss function and structure.

During:

Students will engage in creating a house on a cardstock foundation that follows the basic principles of what houses need. Part of the project will involve having an investigation around the materials and their location, relationships, and similarities/differences. The teacher’s role is to facilitate the students as they are building and redirecting when students lose focus on the objective or include additional items that do not include any function. It is important for the teacher to not stifle any creativity as students imagine and play through this building phase.

If students should finish early, discuss with them their structure and the function of each part of the house that they built. Having them verbalize their designs will reinforce the objective and give them more exploration about describing the parts of the house as they relate locationally to one another.

After:

Before testing with the “Big Bad Wolf” students will make predictions that highlight the perceived strengths and weaknesses of their builds in a presentation format. As the teacher, I’ll encourage use of relational location language in descriptions and probe with questions.

Students will then have their houses tested with a fan and leaf blower. After seeing the results, we will have guided reflections that help students make connections and summarize the materials and their impact on the success or failure.

ASSESSMENT

Observe:

The teacher will have a list of the students and places to mark words used informally as students are building and as the teacher conferences with students briefly. This will indicate to the teacher students who will need support in small group or one-on-one. In the presentation portion, recording language used by students will reinforce what was observed and heard by the teacher earlier or see growth in the vocabulary usage.

Ask:

Teacher’s notes on student responses and the description around the materials both written and informal conversation will assess student learning.