**GYSTC Second Grade STEM Activity**

Unit: Matter

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| **Title of the Lesson:** Prepared Pigs**Estimated Time:** Three to five 30-minute class periods |
| **Standards:** |
| **S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.**b. Construct an explanation for how structures made from small pieces (linking cubes, building blocks) can be disassembled and then rearranged to make new and different structures. |
| **Science and Engineering Practices:** | **Crosscutting Concepts** |
| **Asking Questions and Defining Problems:**Define a simple problem that can be solved through the development of a new or improved object or tool.**Constructing an Explanation:**Make observations (firsthand) to construct an evidence-based account for natural phenomena (some objects can be put back together or their parts rearranged) | **Energy and Matter:**Objects may break into smaller pieces, be put together into larger pieces, or change shapes. |
| **Big Ideas/Enduring Understandings:*** Students will understand how to observe, describe and classify the physical properties of many objects
* Students will be able to explain how matter can change
* Students will understand that some forms of matter can be put back together while others cannot

**Essential Questions:**How can I classify objects by their physical properties? How can explain how matter can change?How can I explain how structures can be assembled and disassembled to build new structures?  | **Vocabulary:**PropertiesMatterchangesobjectsphysical propertiesconstructcolormasslengthtexturehardnessstrengthflexibilityreversedheatingcoolingirreversible |
| **Materials:**Legosfuzzy sticks (pipe cleaners)recycled materials (cardboard, plastic bottles, etc.) |  **Safety Considerations:**  |
|  **Technology Integration:** Computer and projector |
| **Phenomenon:** Some objects can be deconstructed and put back together in a different way. |
| **Project Overview:** There are three new little pigs in town. As they build their new house, no one tells them about a big, bad, wolf in the area that is known for blowing houses down. Students act as the local architects, designing blueprints of a house that can be reassembled in a new and different way if the wolf ever does blow the pigs’ house down. Students also build models of this house so they can show the pigs how the house can easily change.  |
| There are three new little pigs in town. As they build their new house, no one tells them about a big, bad, wolf in the area that is known for blowing houses down. As the local architects, you offer to sell them blueprints of a house that can be reassembled in a new and different way if the wolf ever does blow their house down. You take them into your show room to show them just how easy this building project can be.Criteria: * Your houses must be made out of multiple parts.
* Houses need to have four walls, a roof, and a door.
* The house must be easily taken apart and put back together into a different house using the same materials

Constraints: * You can only use the materials provided by the teacher
* Your second house must use all of the same materials

Allow students to work through the following steps of the Engineering Design Process:Ask: Have students put the challenge in their own words and ask any clarifying questions.Imagine/Brainstorm: Give students 5-10 quiet minutes to draw designs on their own before putting them into groups of 2-3.Plan/Design: When students get into groups, encourage them to share all of their ideas and talk about which idea the group wants to try to build. Create/Test: It helps to give students a wide variety of materials to choose from and then require them to draw out a plan together as a group and ask for a specific list of materials. This helps prevent students from wasting materials trying construction ideas that don’t follow their plans. As students build and see that their designs may need to change, allow them to have more materials to correct any problems that arise.Allow time for students to test deconstructing and rearranging their houses before presenting to the pigs (the class). When students do present, they should have their first design already built, and then show the whole class how, when demolished (as if by the Big Bad Wolf), the house can easily be put back together in a new way. Ask students to **discuss how objects may break into smaller pieces, be put together into larger pieces, or change shapes**.Evaluate/Improve: Students will evaluate their team’s final design for success by answering the following questions: Did your design meet the established criteria? Did your design match your group’s planned design? How would you improve your design? |
| **Closing/Culminating Activity:**Students should **use observations from their design challenge to write an explanation** of how some structures can be disassembled and then rearranged to make new and different structures.  |