KOHL CHILDREN'S MUSEUM

STEAM Explorers

THE PLACE WHERE AWESOME LIVES

Strong, Sturdy, Structures

Use every day and recycled materials to create bridges and towers to support different weight sizes!

Big Idea

Children will explore how to construct infrastructures such as bridges and demonstrating the needs for different materials for different weight capacities.

Illinois Early Learning Standards

11.A.ECb Develop and use models to represent their ideas, observations, and explanations through approaches such as drawing, building or modeling with clay.	Students will build and construct their own bridges to experiment to see what materials build the strongest structure.
11.A.ECc Plan and carry out simple investigations.	Students will create and test their own bridges and towers to withstand different weights
25.A.ECd Investigate and participate in activities using visual arts materials	Students are creating three-dimensional works of art while experimenting with form, texture and space with dry spaghetti noodles and straws

Materials

Bridges

- Paper or straws (a lot!)
- Blocks that are the same size/height
- Tape
- 1KG Weight or multiples of an items such as pennies

Tower

- Sticks of dry spaghetti
- One yard of string
- One yard of tape
- One marshmallow (or similar object)

Setup

This lesson will utilize two different engineering experiments. The first experiment will include building bridges to be able to hold 1kg of weight. The second experiment is constructing the tallest tower possible to support a marshmallow at the top.

Directions

Bridges

- Students will be designing and building a bridge by using every day and recycled materials that will hold 1kg of weight. Use a provocation such as "how can we build a bridge using these materials to hold this object?"
- Students may draw their bridges first to create a blueprint to help construct their bridges.
- After the bridges are constructed, place the 1kg on top of the bridge to see if the weight holds. Use questions to extend children's learning and help them reflect and redesign.
- Students may keep experimenting to with different ways to make the bridge stronger or by adding more weight.

Towers

- Here, students will be challenged to construct the tallest tower possible that will be able to support a marshmallow at the top. Use a provocation such as "How can we build the tallest tower that will support this marshmallow?"
- To start, encourage students to first think of their base. How can they combine the spaghetti to create a strong base?
- Once the students have a base, encourage them to start thinking how to build up as high as they can.
- One children, have gotten their tower as tall as they think will hold the marshmallow, place the marshmallow on top of the tower.
- If the tower falls, ask questions to extend children's learning and keep experimenting with different heights and stronger supports. For an extra challenge, add a time limit of 18 minutes for each child.

Investigation Questions:

- What other materials can you use to make a bridge that holds 1KG weight?
- How many straws did you use for the bridge? Could you use less straws?
- What ways can you fold and bend the paper to make it stronger?
- Can your bridge hold more than 1KG? How can we find out?
- How tall is your tower in inches?
- How many dry spaghetti noodles did you use?
- How can you make your tower stronger?
- Why is building with the spaghetti noodles harder than straws?