ARIZONA
SCIENCE
CENTER

Never stop wondering.
Never stop imagining.™

Cloudy with a Chance of Science! Week 3: Grades K-2

Day 2: A Shelter for Peep - Ask & Imagine

Teacher/Parent Background

Weather is the combination of sunlight, wind, snow or rain and temperature in a particular region and time. Weather has positive and negative impacts on living things. Scientists and engineers study weather and its effects in order to design, test and refine solutions to protect humans from severe weather conditions.

Overview

In this activity, young learners will apply their understanding of weather and engineering concepts to design a shelter for Peep that keeps him and his friends safe, comfortable and dry during a storm.

Related Standards

- **Analyze patterns** in weather conditions of various regions of the world and **design, test and refine solutions** to protect humans from severe weather conditions.

Key Terms

- weather - a mix of sunlight and clouds, wind, precipitation and temperature happening in a certain place at a certain time
- precipitation - any form of water that falls to Earth's surface such as rain, snow, hail and sleet
- engineers - people who design and/or build things to solve problems
- engineering design process - a set of steps engineers use to propose solutions to problems
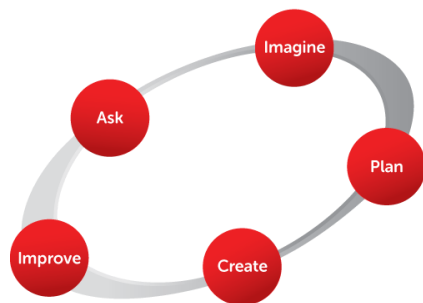
Engineering Design Process

- blueprint - a design plan
- shelter - a place that protects you from bad weather or danger

Materials List

- crayons/pencils
- *Imagine* handout
- 3 objects representing Peep, Chirp and Quack (i.e., stuffed animals, toy animals, blocks, etc.)

Activity Description

1. Revisit the events of the *Stormy Weather* video from Day 1:
   - What problems did Peep and his friends experience during the story?
     - A storm came and Peep and his friends were afraid of the thundering in lightning. When they tried to hide in Peep's shelter (can), they did not fit.
   - How did Peep and his friends decide to solve the problem of the shelter (can) being too small for all of them to fit inside?
     - Peep and his friends decided to leave the shelter (can) and look for a bigger shelter.
   - In the story, Nellie had her own shelter. How was Nellie's shelter (dog house) different from Peep's shelter (can)?
     - Nellie's shelter (dog house) was large enough to fit Nellie and her friends.
     - Nellie's shelter is a different shape and made of different materials.
   - The storm ended before Peep found a new shelter. What do you think will happen the next time there is a storm?
     - Peep and his friends will get wet unless they can find a bigger shelter.
2. Once the student has identified that Peep still needs a bigger shelter if he and his friends are going to be safe and comfortable during the next storm, introduce the engineering design process as a way to help Peep solve his problem:
   - Thankfully for Peep and his friends, the storm ended and the sun returned. But we know that it will not stay sunny forever. Eventually, another storm will come and Peep and his friends are once again going to get wet if they don't find a larger shelter.
   - Engineers are people who are very good at solving problems. They design and build solutions to problems like Peep's. Let's see if we can use our engineering skills to help Peep solve his problem!
   - Before an engineer can start solving a problem, he/she needs to ask questions. An engineer asks questions about the problem, what

materials are available, how long he/she has to solve the problem, etc.
- ○ What questions do you have about Peep's problem?
  - ■ Possible responses:
    - How much room do Peep and his friends need?
      - ○ Provide the student with the 3 objects that will be utilized to represent Peep, Chirp and Quack. This will help the student determine the size of the structure.
    - What can Peep use to make/build his shelter?
      - ○ Share available materials (popsicle sticks, straws, cardboard, empty containers, etc.)
    - How big is Peep's can?
      - ○ Select an object that simulates the situation from the story in which the 3 friends are squished inside the shelter.
    - How much time does Peep have to build his shelter?
      - ○ Share time limit.
  - ■ Be sure to answer each question and ask additional questions which are important to solving the challenge that may not have been articulated by the student.
3. Now that the student has asked and received answers to various questions about the designing and building of Peep's shelter, it is time to facilitate imagining what the shelter will look like given the constraints (space, size, materials, etc.) To do this, provide the student with a copy of the Imagine handout. Prompt him/her to draw his/her ideas.
   - ○ Engineers record their design ideas on paper so they can look at them while they are building and so they can share their ideas with others.
   - ○ These design plans have a special name called a blueprint.
   - ○ You are going to create a blueprint for Peep's shelter. Using crayons or pencils, draw what the shelter is going to look like on this paper (Imagine handout).
   - ○ Be sure to draw more than one idea. Engineers need to consider multiple ways to solve the same problem. What are two ways you could design a shelter for Peep and his friends?
     - ■ Provide the student with time to draw his/her shelter plans.
     - ■ Frequently check in with the student to encourage him/her to include as much detail as possible.
     - ■ You may decide to give the student constraints such as using only certain materials depending on what you have available.
     - ■ Encourage the student to reference the 3 objects representing Peep, Chirp and Quack to ensure the shelter will be large enough to accommodate them all.

Closure

Once the student has completed his/her blueprints, discuss the plans while helping the student to label key attributes such as materials (popsicle sticks, straws, etc.) as needed.

- Describe your plan. Why do you think this is a good shelter for Peep and his friends?
- What material(s) will you use to build Peep's shelter? Why do you think that material is best?
- How will you keep the different parts of the shelter together (i.e., tape, glue, etc.)?
- How is Plan 1 different from Plan 2? Why did you design it that way?

Encourage the student to make necessary revisions based on thinking that might have changed during his/her conversation with you. The goal is to have detailed plans that the student can follow when building. Making changes during the actual building process will be discouraged. The student will have time to consider and make changes to his/her design during the Improve stage of the engineering design process.

Extension

Animal Shelter Matchup

- Match each animal to its shelter.
- Discuss how each animal is suited to its shelter.
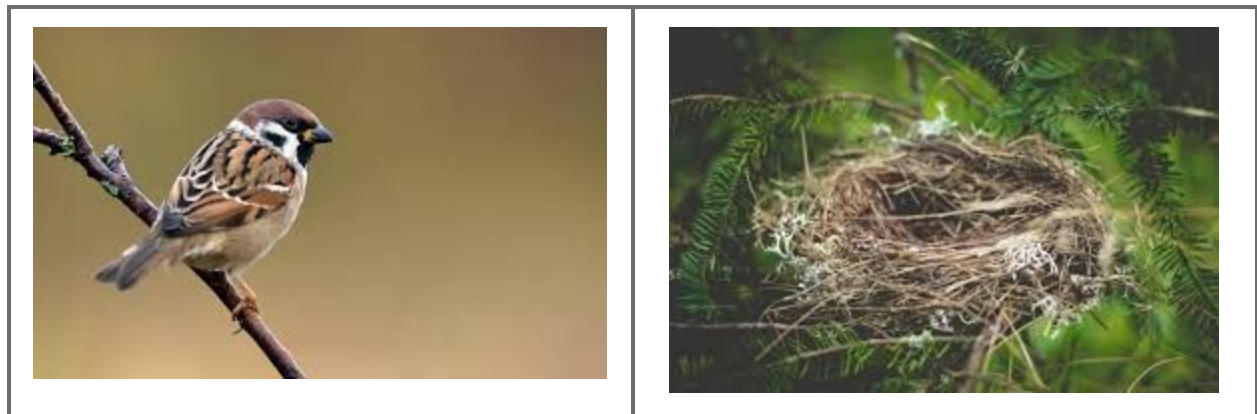
Imagine Handout

Draw two different shelter designs. Remember to label the materials used (straws, popsicle sticks, etc.).

Idea #1

Idea #2