

# Cloudy with a Chance of Science!

## Week 3: Grades K-2

| Day | Topics                              | Related Standards  |
|-----|-------------------------------------|--|
| 1   | Stormy Weather                      | <b>Observe, record and ask questions</b> about temperature, precipitation and other weather data to identify patterns or changes in local weather.   |
| 2   | A Shelter for Peep<br>Ask & Imagine | <b>Analyze patterns</b> in weather conditions of various regions of the world and <b>design, test and refine solutions</b> to protect humans from severe weather conditions.   |
| 3   | A Shelter for Peep<br>Plan & Create |  |
| 4   | A Shelter for Peep<br>Improve       |  |
| 5   | Monsoon!                            | <b>Observe, describe, ask questions and predict</b> seasonal weather patterns and how those patterns impact plants and animals (including humans).<br><br><b>Analyze patterns</b> in weather conditions of various regions of the world and <b>design, test and refine solutions</b> to protect humans from severe weather conditions. |

# Cloudy with a Chance of Science!

## Week 3

### Day 1: Stormy Weather

## Teacher/Parent Background

Weather is the combination of sunlight, wind, snow or rain and temperature in a particular region and time. People use simple tools to collect and record data on elements of daily weather including sun or clouds, wind, snow or rain, and higher or lower temperature. Talking about weather is a daily opportunity to increase children's awareness of the natural world. Over time, these conversations will allow children to see patterns in their observations and explore how weather has an impact on living things.

## Overview

In this activity, young learners will explore and identify evidence of different types of weather.

## Related Standards

- **Observe, record and ask questions** about temperature, precipitation and other weather data to identify patterns or changes in local weather.

## 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
- shelter - a place that protects you from bad weather or danger

## Materials List

- Internet access to [PEEP and the Big Wide World: Stormy Weather](#)
- drawing paper
- crayons/markers/colored pencils
- newspapers and magazines (optional)
- dress up clothes (optional)
- various books about weather (optional)

## Activity Description

1. Play *Stormy Weather* (timestamp 00:00-01:09) video and prompt the student to discuss the current weather in the story:
  - What is weather?
    - Possible responses: sun, rain, how hot or cold it is, etc.
  - What is the weather like in our story?

- Sunny, some clouds, warm
  - How do you know?
    - Clouds in the sky; perfect morning; blue sky; sun in sky; sunned themselves
- 2. Continue *Stormy Weather* (timestamp 01:09-01:30) video and prompt the student to discuss how the weather is changing:
  - How is the weather changing in the story?
    - Possible responses: it looks like it might rain; the wind is blowing; the sun disappeared; it's getting colder
  - How do you know?
    - Gray clouds filled the sky; leaves blew by; the sun was covered by clouds; the water in the river is rippling
- 3. Continue *Stormy Weather* (timestamp 01:30-03:37) video and discuss changes in the weather:
  - Peep, Chirp and Quack couldn't find any of their friends. Why?
    - A storm was coming.
  - What happens when it storms?
    - Clouds fill the sky. The wind starts to blow. Rain begins to fall. Lightning flashes. Thunder claps.
- 4. Continue *Stormy Weather* (timestamp 03:37-04:45) video and discuss:
  - Why do Peep, Chirp and Quack leave the can?
    - The can is too small for them all to fit.
- 5. Continue *Stormy Weather* (timestamp 04:45-08:53) video and discuss:
  - Why isn't Nellie (dog) afraid of the storm?
    - She has a dog house to keep her safe and dry.
  - Where does Nellie find shelter during the storm?
    - Her dog house.
  - What is something good about the storm?
    - The rain waters the plants and causes them to grow.
  - What do Peep, Chirp, Quack and Nellie see in the sky after the storm?
    - A rainbow.
  - What evidence do we see that it rained earlier in the day?
    - Puddles on the ground.

## Closure

Provide the student with a piece of drawing paper. Prompt him/her to fold the paper in half creating two sections. On one half of the paper, prompt the student to record the weather conditions at the beginning of the student. On the other half of the paper, prompt the student to record the weather conditions in the middle of the story. Once the student has completed both drawings, ask him/her to answer the following questions using evidence from his/her paper:

- In the story, how does the weather change throughout the day?

- In the beginning of the story the sky is blue, the clouds are puffy and white and the sun is shining. Later, the sky fills with gray clouds, the wind begins to blow and rain falls. The characters observe thunder and lightning.
- **How are the two types of weather different? How are they the same?**
  - It is sunny and there is no wind compared to cloudy, windy and rainy.
  - There are clouds when it is sunny and when it is rainy.

## Extension

Weather Role Play - dress up for different kinds of weather. Discuss why different types of clothing are needed depending on the weather.

Weather Collage - look for different pictures in newspapers and magazines that depict different types of weather. Create a collage using the pictures.

Read All About It

- May I Come In? by Marsha Diane Arnold (PreK-1)
- Picnic by Matt Phelan (PreK-1)
- A Year with the Wind by Hanna Konola (PreK-1)
- The Weather Girls by Aki (PreK-1)
- Tap, Tap, Boom, Boom by Elizabeth Bluemle (PreK-2)
- Sun by Sam Usher (PreK-2)
- The Rain Came Down by David Shannon (PreK-2)
- Thunder Cake by Patricia Polacco (1-4)

# 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

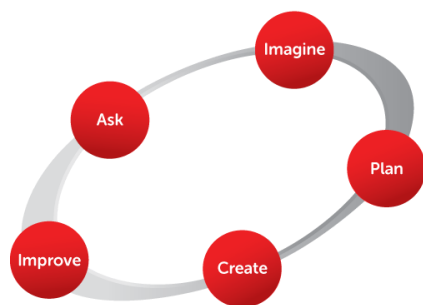
In this activity, young learners will apply their understanding of weather and engineering concepts to design a shelter for Peep that keeps him and his friends safe, comfortable and dry during a storm.

#### 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.

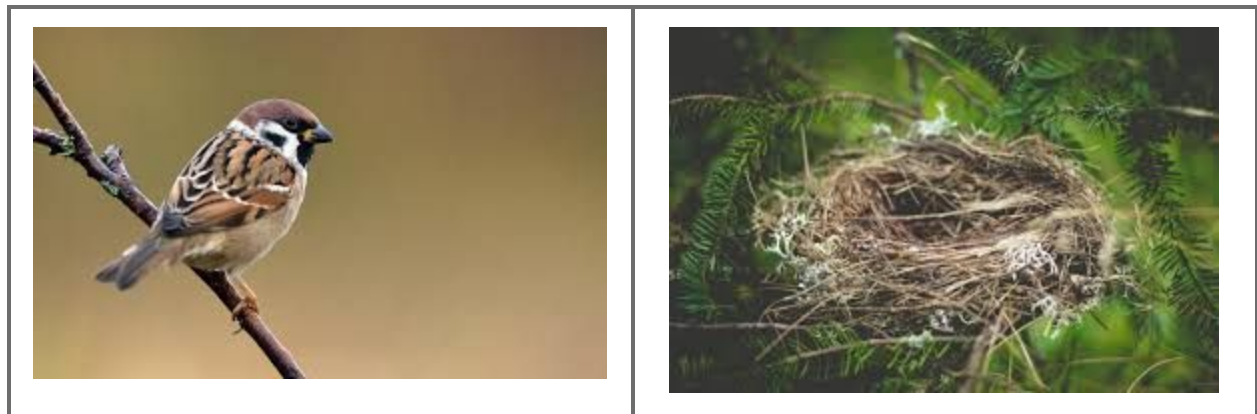
- Describe your plan. Why do you think this is a good shelter for Peep and his friends?
- What material(s) will you use to build Peep's shelter? Why do you think that material is best?
- How will you keep the different parts of the shelter together (i.e., tape, glue, etc.)?
- How is Plan 1 different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

# Cloudy with a Chance of Science!

## Week 3: Grades K-2

### Day 3: A Shelter for Peep - Plan & Create

#### 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

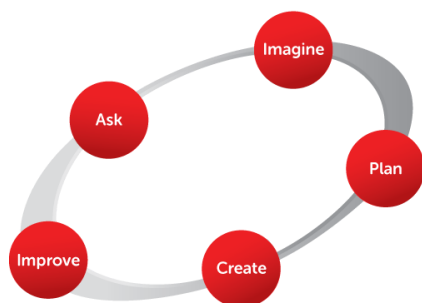
In this activity, young learners will apply their understanding of weather and engineering concepts to plan and build a shelter for Peep that keeps him and his friends safe, comfortable and dry during a storm.

#### 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 from Day 2
- building materials (tape, scissors, glue, etc.)
- shelter supplies (popsicle sticks, straws, cardboard, paper, pipe cleaners, cardboard tubes, empty containers, etc.)

## Activity Description

1. Revisit the student's shelter plans on the *Imagine* handout. Briefly review his/her ideas and then discuss which plan his/she thinks is best.
  - You have two different blueprints for your shelter. You can only build one. Which one do you want to build? Why?
    - The student's decision could be based on style, types of or quantities of materials available, building space available, etc. There is no wrong answer to this question.
2. Provide the student with time, space, materials and adult support (as needed) to create his/her shelter based on his/her selected plan.
  - Reminder you can:
    - build only what you drew (i.e., if the plan shows a rectangular structure, then the structure should resemble a rectangle).
    - use only the materials labeled in the plan (i.e., if the side of the shelter is labeled as popsicle sticks then straws or other material cannot be used).
    - build for \_\_\_\_\_ minutes (time allotment is flexible to your schedule/student's attention span).

## Closure

Once the student has finished creating or the allotted time has elapsed, provide the student with time to test the shelter. Assist him/her in recording the results (i.e., video record using a phone, record on paper, etc.) Then discuss successes and struggles that he/she experienced during the Create stage of the engineering design process:

- Did Peep, Chirp and Quack fit in your shelter? How well?
- What part(s) of creating your design did you find easy? Why?
- What part(s) of creating your design did you find difficult? Why?
- What did you most enjoy about creating your shelter? Why?
- What was your least favorite part about building your shelter? Why?
- If you had more time/materials/space, what would you do next?

- Were there any materials you wish you had but didn't? Why?
- What advice would you give another student who is trying to design and create a shelter?

Before wrapping up the lesson, be sure to remind the student that he/she will have the opportunity to complete the next stage of the engineering design process tomorrow - improve. It may be difficult for the student to "walk away" from the challenge at this point. He/she will probably want to test more and begin improvements right away. Try to avoid this as it is important to provide time for the student to reflect on his/her plan, the results of his/her test and possible improvements.

## Extension

### [Teach Engineering - Which Roof is Tops?](#)

When you look around your neighborhood, what do the roofs look like? What if you lived in an area with a different climate, how might that affect the style of roofs that you see? Through this introductory engineering activity, students consider the advantages of different roof shapes for different climates or situations. During a demo, they observe and discuss what happens when a "snow load" (sifted cups of flour) is placed on three different model roof shapes.

# Cloudy with a Chance of Science!

## Week 3: Grades K-2

### Day 4: A Shelter for Peep - Improve

#### 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

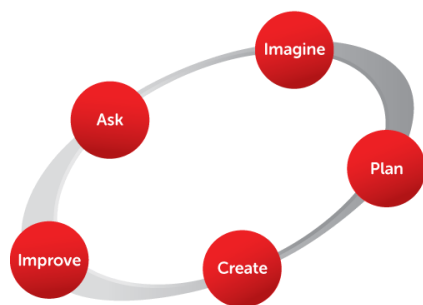
In this activity, young learners will apply their understanding of weather and engineering concepts to propose and implement improvements to a shelter for Peep that keeps him and his friends safe, comfortable and dry during a storm.

#### 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
- shelter from Day 3
- building materials (tape, scissors, glue, etc.)
- shelter supplies (popsicle sticks, straws, cardboard, paper, pipe cleaners, cardboard tubes, empty containers, etc.)
- *Improve* handout

## Activity Description

1. Revisit the student's shelter design using the *Improve* handout. Guide the student in determining which improvements he/she wants to make. These improvements may be structural or aesthetic based on his/her responses to the reflection questions from Day 3.
  - What is the first thing you would like to change about your shelter design? How do you think this will improve your shelter?
    - The student should record (if able) his/her idea on the *Improve* handout using words, phrases and/or pictures.
  - What is another improvement you would like to make to your shelter? Why do you think this improvement is needed?
    - The student should record (if able) his/her idea on the *Improve* handout using words, phrases and/or pictures.
2. Once the student has communicated and recorded all of his/her proposed improvements, provide the student with time, space, additional materials and adult support (as needed) to recreate his/her shelter based on his/her revised plan.
  - Reminder you can:
    - build only what you drew (i.e., If the plan shows a rectangular structure, then the structure should resemble a rectangle).
    - use only the materials labeled in the plan (i.e., if the side of the shelter is labeled as popsicle sticks then straws or other material cannot be used).
    - build for \_\_\_\_\_ minutes (time allotment is flexible to your schedule/student's attention span).

## Closure

Once the student has finished recreating or the allotted time has elapsed, provide the student with time to retest the shelter. Assist him/her in recording the new results (i.e., video record using a phone, record on paper, etc.) Then

discuss successes and struggles that he/she experienced during the Improve stage of the engineering design process:

- How was your shelter's test results the same or different than last time? Why do you think this happened?
- What improvements did you find easy? Why?
- What improvements did you find difficult? Why?
- What did you most enjoy about improving your shelter? Why?
- What was your least favorite part about improving your shelter? Why?
- If you had more time/materials/space, what would you improve next?
- Were there any materials you wish you had but didn't? Why?
- Do you have any new advice to give another student who is trying to design and create a shelter? If so, what would you tell him/her?

## Extension

Share It! - Write a letter to Peep explaining how you created a new shelter for him and his friends. Point out all the great features of your design and include a drawing of the shelter for Peep to see.



## Improve Handout

| Proposed Improvement  | What Problem It Solves |
|---|------------------------|
|   |                        |
|   |                        |
|   |                        |
| <p data-bbox="560 1031 1062 1066" style="text-align: center;"><b>Revised Plan with Improvements</b></p> |                        |

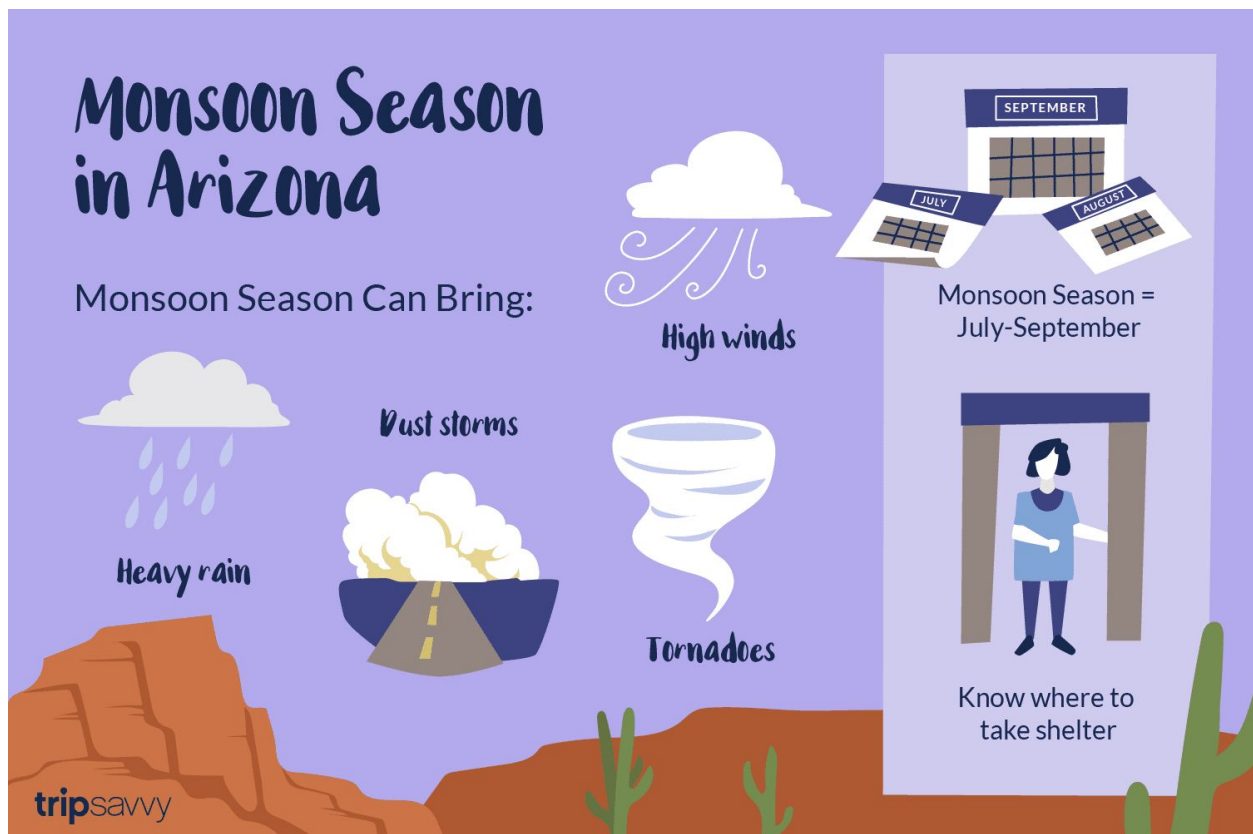
# Cloudy with a Chance of Science!

## Week 3: Grades K-2

### Day 5: Monsoon!

#### Teacher/Parent Background

Arizona's monsoon season begins in June and continues through September. With it comes higher humidity, which can lead to thunderstorms, heavy rain, lightning, hail, high winds, flash flooding, dust storms and extreme heat.



#### Overview

In this activity, young learners will apply their understanding of weather and engineering concepts to propose and implement improvements to a shelter for Peep that provides him shelter during Arizona's monsoon season.

#### Related Standards

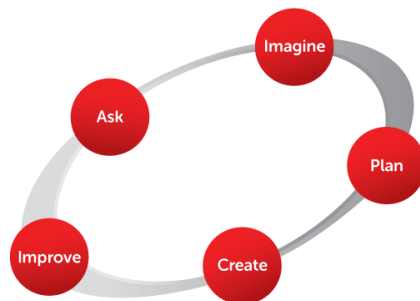
- **Observe, describe, ask questions and predict** seasonal weather patterns

and how those patterns impact plants and animals (including humans).

- **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
- monsoon - a prevailing wind, blowing from the southwest between May and September and bringing rain
- season - a part of the year marked by particular weather patterns and daylight hours
- humidity - the amount of water (vapor) in the air
- haboob - a violet wind blowing in summer bringing sand from the desert
- 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
- shelter from Day 4
- objects to represent Peep, Chirp and Quack (i.e., stuffed animals, toy animals, blocks, etc.)
- building materials (tape, scissors, glue, etc.)
- shelter supplies (popsicle sticks, straws, cardboard, paper, pipe cleaners, cardboard tubes, empty containers, etc.)
- *Monsoon Season in Arizona* image
- *Planning for Monsoon Weather* handout

- hairdryer or fan

## Activity Description

1. Revisit the student's improved shelter design from Day 4. Review the test results and student's reflections on the experience:
  - Yesterday, you made some improvements to your shelter for Peep.
  - Were Peep and his friends able to fit comfortably in your shelter?
  - How do you think they would have felt during the thunderstorm if they could have waited in the shelter you designed? Why?
2. Share the *Monsoon Season in Arizona* image:
  - Peep and his friends experienced a type of weather called a thunderstorm.
  - During some seasons of the year in Arizona, thunderstorms happen often/a lot.
  - Other times of year, or seasons, there are hardly any thunderstorms in Arizona.
  - Most of the thunderstorms we experience in Arizona happen during what is called monsoon season.
  - Monsoon season happens mostly during the summer months.
  - The air around us, which is usually dry, becomes more humid. That means there is more moisture or water in the air. This causes clouds to form and rain to fall.
  - It is also more windy during the monsoon season in Arizona. Sometimes the wind blows when it is not raining. This causes dust and dirt to get into the air and form a dust storm called a haboob.
  - Imagine if, instead of a thunderstorm, Peep and his friends needed shelter during a haboob. How might your shelter design change? Why?
3. Revisit the student's shelter design using the *Planning for Monsoon Weather* handout. Guide the student in determining which changes he/she wants to make.
  - What might you change about your shelter design so it will protect Peep and his friends from the strong winds and dust that happen during a haboob? How do you think this will improve your shelter?
    - Explain that a hairdryer/fan will be used to test the shelter's response to strong winds.
    - The student should record (if able) his/her idea on the *Planning for Monsoon Weather* handout using words, phrases and/or pictures.
4. Once the student has communicated and recorded all of his/her proposed changes, provide the student with time, space, additional materials and adult support (as needed) to recreate his/her shelter based on his/her revised plan.
  - **Reminder you can:**

- build only what you drew (i.e., If the plan shows a rectangular structure, then the structure should resemble a rectangle).
- use only the materials labeled in the plan (i.e., if the side of the shelter is labeled as popsicle sticks then straws or other material cannot be used).
- build for \_\_\_\_\_ minutes (time allotment is flexible to your schedule/student's attention span).

## Closure

Once the student has finished recreating or the allotted time has elapsed, provide the student with time to test the shelter using a hairdryer or fan to simulate strong winds. Assist him/her in recording the results (i.e., video record using a phone, record on paper, etc.) on the *Planning for Monsoon Weather* handout. Then discuss successes and struggles that he/she experienced during the engineering design process:

- How well did your shelter protect Peep and his friends from the wind?
- If you had more time/materials/space, what would you improve?
- Were there any materials you wish you had but didn't? Why?
- Do you have any new advice to give another student who is trying to design and create a shelter? If so, what would you tell him/her?

## Extension

Learn More About Monsoons

- Read [Hip, Hip, Hooray, It's Monsoon Day!;/¡Ajúa, ya llegó el chubasco!](#) by Arizona-Sonora Desert Museum
- Watch [The 2013 Arizona Monsoon](#) by Mike Olbinski

## Planning for Monsoon Weather Handout

| Proposed Changes                                       | What Problem It Solves |
|--|------------------------|
|  |                        |
|  |                        |
| <p style="text-align: center;"><b>Revised Plan</b></p> |                        |
| <p style="text-align: center;"><b>Results</b></p>      |                        |

**Monsoon Season  
in Arizona**

Monsoon Season Can Bring:

- Heavy rain
- Dust storms
- Tornadoes
- High winds

Monsoon Season =  
July-September

Know where to  
take shelter

trip Savvy

The infographic features a purple background with a desert landscape at the bottom, including red rock formations and green saguaro cacti. On the left, the title 'Monsoon Season in Arizona' is written in a large, dark blue, cursive font. Below the title, the text 'Monsoon Season Can Bring:' is followed by four weather-related icons: a grey cloud with raindrops, a yellow dust cloud with a blue umbrella, a white and blue tornado, and a white cloud with wind lines. To the right, the text 'Monsoon Season = July-September' is displayed above three calendar icons for July, August, and September. Further right, an illustration of a person in a blue shirt and dark pants standing in a doorway is shown, with the text 'Know where to take shelter' below it. The 'trip Savvy' logo is located in the bottom right corner.