



Spring is near, bringing all kinds of changes to the natural world! The weather shifts, plants start to bloom, and animals get ready for a season of growth.

In this packet, you'll explore the science behind springtime changes. Get ready to ask questions, test ideas, and model real-world systems as you explore plant processes, animal behavior, and motion. These activities invite you to think like a scientist by observing, experimenting, and drawing conclusions about the spring season.

This packet includes...

- Exploring Bird Nests
- Build a Bug Hotel
- Discovering Photosynthesis
- Garden Design Challenge
- Launch Into Spring
- Frog Jump Origami
- Spring Crossword



Explore More

Looking for more ways to celebrate spring? Check out these suggestions!



Spring Cleaning: Grab a trash bag, gloves, and some friends to walk through your neighborhood and collect litter!



Spread the Word: Research facts about plants and animals native to your area, then share them around your neighborhood using sidewalk chalk.



Backyard Buffet: Visit a local plant nursery and ask for guidance on choosing native plants that attract pollinators. Then start a garden to feed bees, butterflies, and more!



Compost Creator: Help the environment and reuse your food scraps by starting to compost! Search online for “EPA compost at home” for suggestions and tips.



Directions: In this activity, you will design and build a model bird nest. As you read, pay attention to how different nest types help birds' eggs survive. You will use this information to guide your own design.



Cup Nest

Birds do not all build the same kind of nest. The shape, size, and location of a nest depend on where the bird lives and what challenges it faces. A nest must protect eggs from weather, predators, and falling. Over time, birds have developed different nest designs that help their young survive.



Platform Nest

One common nest type is the **cup nest**. These nests are round and shaped like a bowl. Small birds often build them in tree branches using grass, twigs, mud, and soft materials. The raised sides help keep eggs from rolling out.



Hanging Nest

Larger birds, such as hawks and eagles, build **platform nests**. These nests are wide and flat, made from thick sticks. Platform nests must support more weight, since large birds and their chicks are heavier.

Some birds build nests that hang below branches. These **hanging nests** are woven tightly and are difficult for predators to reach.



Ground Nest

Other birds build nests on the ground. Instead of building tall walls, **ground-nesting** birds rely on **camouflage**. Their eggs are often speckled so they blend in with soil or rocks.

Some birds, such as woodpeckers, use **cavity nests** inside tree trunks. The solid walls of the tree provide strong protection from wind and rain.



Cavity Nest

Each nest type solves a different problem. Birds choose designs that match their habitat, body size, and safety needs. When we study bird nests, we can see how structure and environment work together. Birds are not just building homes; they are building for survival.



Build a Nest Challenge

Step 1: Design and Gather Materials

Choose one type of nest to build:

- Cup
- Hanging
- Platform



Now, gather the materials you will use.

You may use household materials (such as recyclables, paper, string, fabric, or craft supplies) or safe natural materials (such as twigs, grass, or leaves).



List the materials you collected:

Why are these materials a good choice for your nest type?

Draw a diagram of your nest design before you build it. Label important parts.



Step 2: Build and Test

Build your nest using the materials you collected.

When your nest is complete, you will test it to see if it can survive real-world challenges. Bird nests must withstand **movement**, **wind**, and **weight**. All nests must pass the Shake Test and Wind Test. Platform nests must also pass the Load Test.

Place three small “eggs” (rocks, pom-poms, or paper balls) inside your nest before testing.

Test 1: The Shake Test - Movement

Nests built in trees move when branches sway.

- If you built a cup or platform nest, place it on a table.
If you built a hanging nest, hang it from a safe support.
- Gently shake the table or support for five seconds.

Did the nest stay together?

Yes No

Did the eggs stay in the nest?

Yes No

Test 2: The Wind Test - Weather

Bird nests must survive wind and storms.

- Blow air toward the nest or use a fan on low speed for five seconds.
For hanging nests, allow it to swing naturally.

Did the nest stay together?

Yes No

Did the eggs stay in the nest?

Yes No

Test 3: The Load Test (platform nests only)

Large birds build nests that must support heavy weight.

- Add extra weight, such as small rocks.
- Hold for 10 seconds.

Did the nest support the weight without collapsing?

Yes No

Step 3: Reflect

Which test was most challenging for your nest? Why?

If you were to rebuild your nest, what would you do differently?



What Is a Bug Hotel?

Believe it or not, bugs can be helpful! Bugs can help the environment by helping plants reproduce and by eating harmful bugs like mosquitoes. By giving them a place to live and grow, you can bring helpful bugs back to where you live by giving them a place to stay!

Bug hotels give bugs a home when their habitat, or place they used to live, is removed by clearing trees or building houses and stores. These bugs can keep unhelpful pests away and make nature more diverse.



Making Your Own Bug Hotel:

To gather materials for your bug hotel, all you need to do is get out in nature! Visit a local park, go for a hike, and get creative! As you collect materials for your bug hotel, use these questions and the space below to plan your design.

Materials:

- Sticks
- Leaves
- Cardboard
- Small pots
- Toilet paper rolls
- Wood chips
- Rolled up paper
- Pieces of bark
- Branches or logs

Questions To Consider:

What materials can go outside without being damaged by wind or rain?

What materials do you think bugs will like best?

What will you build your bug hotel in?

Use this space to help you plan your design:



Building Your Bug Hotel:

Step 1: Choose the Base

Use a box, crate, or small pot for the base of your hotel.

*Tip: Make sure it can stay outside, even in the rain!

Step 2: Fill Your Base

Use your gathered materials and start working them into the base. Start with bigger items. Put empty recyclable containers, toilet paper rolls, or large sticks in the box to make a structure. Then start wedging in smaller items.

*Tip: Make sure to give your bug friends lots of little hiding places inside your hotel! Take a look at the pictures below for ideas.

Step 3: Find a Safe Space

Figure out where you're going to put your bug hotel. Find a nice, dark place with a bit of shelter, such as near a woodpile, in a garden, or under a bush or tree.

*Tip: If you don't have space near your home, ask an adult about talking to the park service. Maybe you can set your bug hotel up at a local park!



Now that your hotel is set up, you'll start getting some visitors! With an adult's help, use the internet to research what bugs are visiting, or check out a bug guide from your local library!



Have you ever wondered what plants are doing in the sunlight? Even though they seem still, important changes are taking place inside their leaves. Try this experiment to investigate how plants use sunlight and water!

Supplies:

- Fresh leaves from a tree or plant
- Clear bowl or container
- Room temperature water
- Small, heavy objects to weigh leaves down, like rocks or marbles



Setting Up:

1. Collect leaves from a tree or plant. Only collect a few so the plant stays healthy.
2. Fill the clear bowl or container with room temperature water.
3. Gently place the leaves in the water in a single layer. Make sure they are fully submerged, or covered by water.
4. If the leaves float, place a small, heavy object on them to help hold the leaves under the water.
5. Put the bowl in a sunny spot. Wait for two to three hours.

Make Observations:

After waiting two to three hours, look closely at the leaves. Write or draw what you notice.

What happened?

Plants make their own food through a process called **photosynthesis**. During this process, they use sunlight, water, and carbon dioxide from the air to produce **glucose**, or sugar.

As plants make food, they also produce **oxygen**. When they produce more oxygen than they need, the excess oxygen leaves the leaf.

Because your leaves were underwater, that oxygen formed **bubbles**.

You just observed photosynthesis in action!



Imagine you've been asked to design a **rectangular** spring garden bed for a family that wants to grow flowers and vegetables. The family has exactly **36 feet of fencing**, and the **entire fence must be used**.

Step 1: Design Two Gardens

- Draw two different rectangular gardens, each using 36 feet of fencing. For each one...
 - Label the length and width.
 - Show your perimeter calculation.
 - Find the area.



1 square = 1 ft²

Step 2: Compare Your Designs

Which garden gives more planting space?

Why do two gardens with the same perimeter have different areas?

Optional Challenge

Can you design a third garden with a perimeter of 36 feet that has an even larger area?

Need help with perimeter or area? Click or scan the QR code for a review!





In this activity, you will design and build a cotton ball launcher. Act like an engineer as you build, test, and improve your design to make a cotton ball travel as far as possible.

Read through all instructions and get permission from a guardian before you begin!

Materials:

- 10 craft sticks
- 5-10 rubber bands
- Spoon
- Cotton balls
- Ruler or measuring tape (optional)



Instructions:

1. Stack five craft sticks. Wrap a rubber band around each end to make your base.
2. Stack two craft sticks and wrap a rubber band around **one end only**. This is your throwing arm.
3. Slide the large stack of sticks in between the two stacked sticks of the throwing arm until it almost reaches the rubber band. This will create a lever.
4. Attach the spoon to the top stick with one to two rubber bands. The bowl of the spoon should stick out past the base.
5. Place a cotton ball on the spoon. Hold the base down on a flat surface. Press down on the bowl of the spoon and release to launch.
6. Test your launcher.
 - a. Which direction did the cotton ball go?
 - b. How far did it travel? Measure, if you can.
7. Improve your design by changing one thing at a time before testing again. Try to get your ball to go as far as possible. Some changes you could test:
 - a. Make the stack of craft sticks bigger or smaller
 - b. Move the large stack of craft sticks closer or further from the rubber band holding your throwing arm together
 - c. Use a lighter or heavier spoon

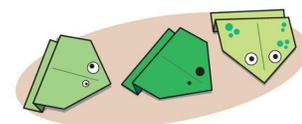
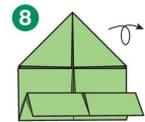
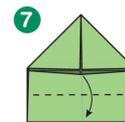
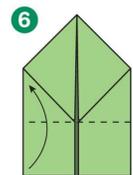
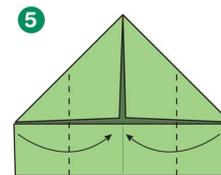
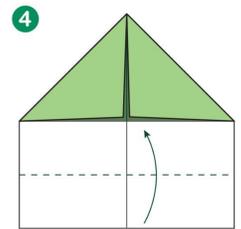
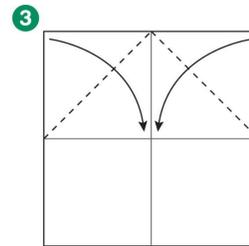
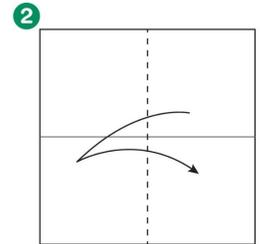
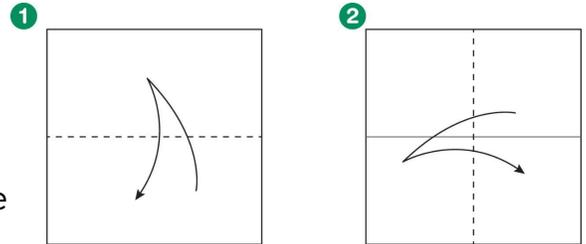
Challenge Yourself! Engineers test their designs many times. Can you make your cotton ball land in almost the same spot three times in a row? Adjust your launcher to improve consistency.



Origami is the Japanese art of folding paper to create objects such as flowers or animals. Follow the directions below to turn a piece of paper into a jumping frog! Make sure to firmly press each fold to form the creases.

Begin with a square piece of paper. The type and color of paper are your choice.

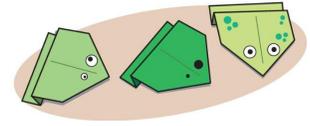
1. Fold the paper in half by making the top and bottom edges of the paper meet. Then, unfold the paper back into the square.
2. Fold the paper in half again by making the right and left edges of the paper meet. Then, unfold the paper back into the square. You should now see a plus sign crease in the middle of the paper.
3. Fold the top left and right corners of the paper in so they meet the center of the plus sign. This will create two diagonal lines.
4. Fold the bottom edge of the paper up to meet the bottom of the two corners you folded in Step 3.
5. Fold in the right and left edges to meet in the middle of the paper.
6. Fold the bottom edge of the paper about halfway up to meet the ends of the diagonal lines created in Step 3.
7. Fold the same section from Step 6 back down, splitting it in half.
8. Flip your paper over and press down on the back to see your frog jump.
9. Add eyes and decorations to make your frog unique.





Materials

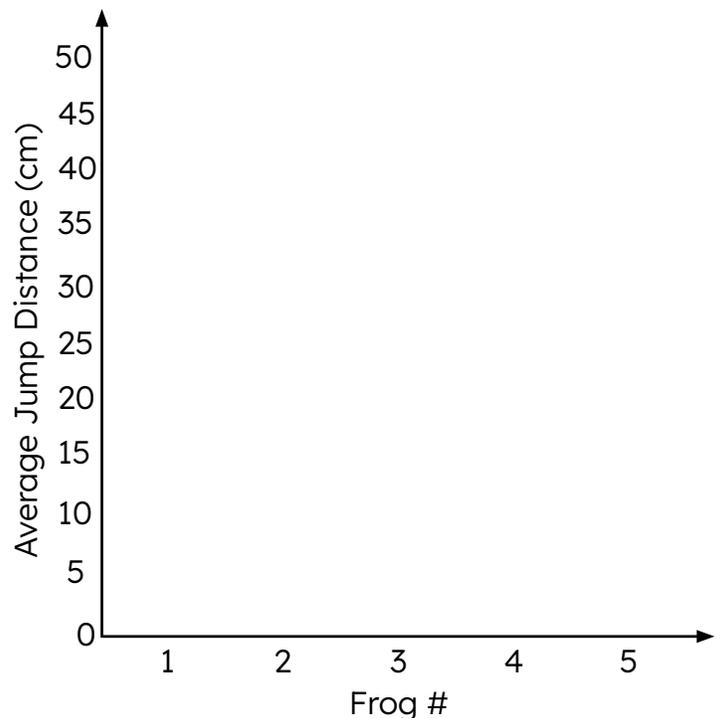
- 3-5 different types/sizes of paper
- Pencil
- Ruler or measuring tape
- Markers or colored pencils to decorate the frogs (optional)



Directions

1. Follow the “Frog Jump Origami” steps to create three to five frogs made out of different types OR different sizes of paper.
2. Number each frog and record the size or type of paper used in the table.
3. Test how far each frog jumps in three trials.
 - Use your ruler or measuring tape to measure the jump distance in centimeters for each trial, and record each jump distance in the table below.
4. Calculate the average (mean) of the jump distances for each frog. (Add up the three trials and then divide by three.) Record your results in the table.
5. Complete the bar graph by drawing a bar to represent the average jump distance for each frog.

Frog #	1	2	3	4	5
Jump 1 Distance					
Jump 2 Distance					
Jump 3 Distance					
Average					





Directions: Read each clue carefully to figure out the word that matches. Write the word in the boxes going across or down, making sure it fits and shares letters correctly with other words. If you get stuck, skip it and come back later. Sometimes other answers will help you unlock words in the puzzle.

Across

- 1: used by birds to protect their eggs
- 3: the gas plants release during photosynthesis
- 5: a plot of land used for growing various plants and flowers
- 6: the natural environment where a species lives

Down

- 1: the world of living things and the outdoors
- 2: In the spring, we may get more rain
- 4: the sugar plants produce
- 5: the increase in size of a plant

		1		2			
			3			4	
5							
6							