INDEX FOR SCIENCE

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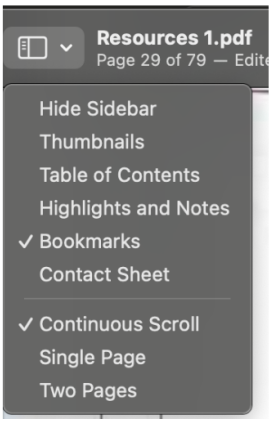


From PBS: Simple ways to study science

Habitat Explorers

You don't have to live near a farm or zoo to visit animals. Almost every yard, park and neighborhood is home to a variety of insects, mammals and birds. What evidence can we find that tells us animals have been here? A nest? A spider's web? Tracks?

From pill bugs to centipedes, many interesting little critters live under rocks, leaves or in rotting logs. Wonder aloud with statements like "I wonder how that bug's shell helps it," or "I wonder what the ant finds to eat here," to encourage your child to be curious and think like a scientist.

Tree Investigators

Trees come in many shapes and sizes, have fascinating yearly growth cycles, and even serve as habitats for spiders, squirrels, and birds. Find a tree that is small enough for you and your child to investigate up close. Begin to look for evidence of other living things, such as a nibbled leaf, nests or holes that might double as a creature's home. Where are the tree's seeds? In a pod, pinecone, nut, or fruit?

Visit the same tree a number of times over the course of a year and make note of the changes it goes through. What does it look like in each season? What differences does your child notice? Use a camera or notebook to document these changes.

Shadow Detectives

With a piece of chalk and a sidewalk or a driveway, you and your child can watch shadows change over the course of a day. First, trace your child's feet, then outline their entire shadow. Repeat this process at intervals throughout the day, returning to the same spot and standing in the same place. Pay attention to where the sun is in the sky and how this affects the size of the shadow. Is it longer in the middle of the day or late in the day?

You and your child can explore the same concept indoors! You can set up a scene with blocks or toys: using a flashlight as a sun, shine light toward your blocks or toys to create shadows. When the flashlight is right above a block tower, the shadow will be short. When the flashlight is closer to the ground, the shadow will grow longer.

Airplane Engineers

A few sheets of paper can help kids begin to investigate how things travel through the air. You can find instructions for making paper airplanes online and modify these ideas to create your own design.

Try out different airplane designs. Do they all work equally well? Experiment with different sizes and weights of paper, and with adding paper clips to different parts of the structure.

Airdrop Physicists

For this activity, visit the playground — you need a high perch where you and your child can safely investigate how different items fall to the ground. Bring various materials to drop, such as soft balls, feathers, pieces of paper, etc. Do they all fall to the ground the same way? What do they look like as they fall? If you drop an acorn and a feather at the same time, which arrives first? Does a piece of paper fall the same when it is dropped as an open sheet as it does when crumpled into a ball? How about when folded as a paper airplane?

Talk about two science principles that are at play: gravity and air resistance. Gravity pulls objects to the earth. Air resistance causes objects — such as a large leaf or piece of paper — to fall more slowly than a pebble or a crumpled piece of paper.

STEM WEBSITES

Earth and space

http://www.learnplayimagine.com/2013/03/how-does-it-rain.html
How does it rain?

http://kidsactivitiesblog.com/47096/air-pressure-experiment-for-kids-2?utm_source=loveandmarriageblog.com&utm_medium=referral&utm_campaign=pubexchange
air pressure

http://www.learnplayimagine.com/2014/05/making-raisins.html#_a5y_p=2660460
power of the sun

http://www.learnplayimagine.com/2014/04/learning-about-day-and-night.html
day and night

http://activity-mom.com/2014/03/13/simple-experiment-with-light/
making stars

http://cocopreme.hubpages.com/hub/shadowexperimentsandactivitiesforkids
shadows

http://carrotsareorange.com/teaching-georgraphy-preschoolers-land-forms/
land and water

http://www.123homeschool4me.com/2011/09/m-is-for-moon.html
http://www.learnplayimagine.com/2014/06/gross-motor-game-to-learn-phases-of-moon.html
phases of the moon

https://www.pinterest.com/pin/159385274288336319/
cloud viewer

more ideas http://www.learnplayimagine.com/2014/07/moon-activities-for-kindergarten.html

Day and Night Art

Have students create pictures that illustrate things they do during the day and things they do during the night. Provide children with a large piece of artist paper and draw a line down the centre of it. Set out markers, crayons, paint and other art materials. Instruct children to draw a daytime picture on one side of the paper and a nighttime picture on the other side. After children have completed their artwork, invite them to share it with the class, explaining what their pictures depict.

Physical Science

http://play-trains.com/two-color-oil-and-water-discovery-bottles/
oil and water

http://artfulparent.com/2012/07/melting-ice-science-experiment-with-salt-liquid-watercolors.html
melting ice with salt

http://www.teachpreschool.org/2014/07/fun-with-frozen-making-ice-grow/
make ice grow

http://www.stevespanglerscience.com/blog/guest-contributor/mad-bubble-scientist-an-indoor-bubble-experiment-for-all-ages/
bubbles indoors

http://babbledabbledo.com/science-engineering-kids-tensile-bubbles/
tensile bubbles

http://we-made-that.com/string-phone/
make a phone

http://www.prekinders.com/how-far-will-a-magnet-jump/
http://www.pre-kpages.com/muffin-tin-magnet-tray/
jumping magnets

http://www.teachpreschool.org/2012/01/exploring-what-will-float-or-sink-in-preschool/
http://www.stirthewonder.com/science-books-preschoolers-sinkfloat-experiment/
float or sink

http://littlebinsforlittlehands.com/preschool-water-science-experiment/
absorb or not

Life Science

http://buggyandbuddy.com/science-kids-exploring-leaves/
how plants drink

patterns in nature

http://www.mamamiss.com/2013/08/30/learning-monkeys-butterfly-life-cycle-activity/
life cycle of the butterfly

https://www.pinterest.com/pin/234116880599902908/
apples to oranges

http://pre-kpress.blogspot.com/2013_09_01_archive.html
apples

http://www.nurturecreek.com/2011/09/distinguishing-living-natural-non.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+LivingAndLearning+(Living+and+Learning)
living and non living

http://eisforexplore.blogspot.com/2012/02/molting.html
molting

Technology

1. make a machine. using recycled materials and broken toys, create an inventors box and make a "machine" Kids describe what it does and how it works!
2. Tinkering space in the classroom
3. use ramp or lever technology to solve a problem.
   http://www.technologystudent.com/forcmom/lever1.htm
4. https://itunes.apple.com/us/app/my-story-book-maker-for-kids/id449232368?mt=8

to make a storybook.

Engineering
know your materials
http://www.science-sparks.com/2012/04/16/introducing-materials/

http://littlebinsforlittlehands.com/cardboard-tube-marble-run-building-activity-for-kids/
marble run

http://www.science-sparks.com/2012/03/15/looking-at-structures/
make a strong structure with spaghetti and marshmallows

http://www.learnwithplayathome.com/2014/07/bricklaying-for-kids-invitation-to-play.html
catapult and paper airplanes
build a house using bricks and mortar

http://librarianismchronicles.blogspot.com/2010/01/force-and-motion-experiment.html
force and motion

engineering challenge: make a way for the car to go from here to there, not in a strait line
build a tower with a variety of building materials

http://creeksidelearning.com/stem-activities-for-kids-how-strong-is-a-piece-of-paper/
which shape is the strongest?

Math
http://crayonboxchronicles.com/2013/10/30/diy-geoboard-with-fabric-loops/
make a geoboard

http://www.kindergartenkindergarten.com/2012/06/problem-solving-measurement.html
measuring activity

http://www.pediastaff.com/blog/ot-therapy-idea-of-the-week-as-seen-on-pinterest-ping-pong-ball-match-8788
ping pong ball match

STEM idea websites
http://www.playdoughtoplato.com/20-kids-science-experiments-can-home/

http://www.learnplayimagine.com/2014/05/making-raisins.html#_a5y_p=2660460

http://learnersinbloom.blogspot.com/2012/08/preschool-science-learning-about-air.html

http://makerfaire.com/global/

http://www.notimeforflashcards.com/other-activities/math-activities

Contact Monica Levy- 877.669-5867, monica@leapsmart.org, www.leapsmart.org

This is not a stick...

It's a wand
It's a guitar
It's a shovel
It's a horse
It's a baton
It's a telescope
It's a sword
It's a microphone
It's a ski pole
It's a spoon
It's a fishing pole
It's a treasure finder
It's a paddle.

and anything else a child can imagine!

NATURE PLAY

TEACHES KIDS TO

CLIMB HIGHER • THINK CREATIVELY

FIND THEIR OWN RHYTHM • EXPLORE

IMAGINE • RELY ON THEIR SENSES

ASSESS RISK • TEST THEIR BOUNDARIES

USE THEIR OUTSIDE VOICE • OBSERVE

NURTURE LIFE • RESOLVE CONFLICT

CULTIVATE A SENSE OF PLACE & SELF

IMPROVISE SOLUTIONS • FEEL FREE

RECOGNIZE BEAUTY • COLLABORATE

BE RESILIENT • REGULATE STRESS

LEARN THROUGH PLAY • WONDER WHY

GET MESSY • DEVELOP THEIR STRENGTH

BUILD IMMUNITY • GAIN PERSPECTIVE

FEEL CONNECTED TO THE WILD

Wilder Child | www.wilderchild.com

Nature Circle activities:

1) To introduce a nature walk, have a box in which you put some of the things the children might see as they walk. Ask them what they notice about the items you show them and give them any additional information that you would like them to have. The box can include a book about what is in the box. *(A Tree for Me)*
2) Exploring the colors of the forest: Gather green and brown paint chips
3) A box should have items that the children can touch and explore you might want to include tweezers and magnifying glasses.
4) Paint chip trees activities (creating trees with the different shades of green and brown paint chips)
5) **The *Nature's Treasures* mystery game** is an activity that facilitates hands-on exploration of the senses and nature. Children get to experience how their perception of the world is altered when their senses are limited. The use of natural objects connects learners to their environment and allows them to experience things they encounter every day in a new way.

Materials:

A) Gather an assortment of familiar natural objects (e.g. a dandelion, rock, shell, lobster claw, stick, cattail fluff, maple leaf, an animal bone, feather, dirt, etc.). Collect enough items, so each child participating has an item. Make sure your collection is gathered and stored out of sight of your learners. You don't want to spoil the mystery!

B) Place one mystery object in an opaque bag; brown lunch bags are great. Seal the bag with ribbon or a piece of tape.

C) Place the bags in a "treasure chest" (a decorated cardboard box) and take the treasure chest out for the children.

Nature's Treasures Mystery Game:

A) Introduce the activity by talking about the incredible diversity that may be found in nature. Have your learners offer examples of colors, textures and shapes they may find in nature (e.g. tiny snails; red, orange, and yellow autumn leaves; prickly porcupines; furry raccoons; bumpy shells, etc.).

B) Using the examples provided by the children, make connections to how people use their senses to experience the world.

C) Explain that each mystery bag contains one object found in nature. They must try to guess what is in their bag without using their sense of sight, sound, or taste.

D) Encourage each child to choose a mystery bag and tell her to keep the bag closed tight. No peeking!

E) Each child gets a turn to fully explore the object with their sense of touch and smell. If she goes to smell the bag, she has to keep her eyes shut, or use a blindfold to help keep the mystery object hidden.

F) The child exploring the item may tell the group about the object based on her sensory observations. *For example, if the object is a dandelion, a child may describe it as follows: There is a fluffy, soft part on one end. It is round. The round, soft part is stuck to something that is long and skinny. It smells like grass.*

G) Ask the child doing the direct sensory exploration to identify her mystery object.

H) Then open the inquiry to the group. Does anyone think the object is something else?

I) Reveal the mystery object. Hopefully, when the object is revealed most of the learners will know what it is right away. If they didn't guess correctly, this is a great opportunity to ask how their sense of sight, sound or taste would have helped them solve the mystery.

6) **Nature Vocabulary Practice:**

Introduce a new nature vocabulary word or two during each session. Write each new word on an index card and review the stack occasionally. Where do you get nature vocabulary ideas? Anywhere – common or scientific names of nature items, geography terms, and words that describe nature (ie. *growth, rapids, erosion, pollination.*) Work on vocabulary that has to do with your current nature walk focus when possible.

7) **Leaf Themes:**

Books: *Red Leaf, Yellow Leaf* by Lois Elhert
***Leafman* by Lois Elhert**
***The Very Last Leaf* by Stef Wade and Jennifer Davidson**
***Leaves Fall Down: Learning About Falling Leaves* by Lisa Bullard**
***Leaves* by David Ezra Stein**

Materials:

Gather several types of leaves – different shapes and, if possible, colors

A) Ask the children what they know about leaves

B) Have them notice the different shapes and talk about what they think about when they see them.

C) Notice the different colors and shades of color, what makes the color? Leaves are colored **by molecules called pigments**. The pigment that causes leaves to be green is chlorophyll. **Chlorophyll** is important for plants to make food using sunlight. During spring and summer when there is plenty of sunlight, plants make a lot of chlorophyll.

D) Why do leaves change color?

In the fall, because of changes in the length of daylight and changes

In temperature, the leaves stop their food-making process. The chlorophyll breaks down, the green color disappears, and the yellow to orange colors become visible and give the leaves part of their fall splendor.

E) Graph which shape your learners like the best

F) Have the learners sort the leaves by color and shape

8) Gather a pile of differently shaped leaves (maybe three different shapes)

A) Put a different shaped leaf in each of three containers

B) Have one child at a time take a leaf from the pile and put it in the container that contains a leaf of the same shape

Art Projects:

1) **Leaf Prints**- Have the children paint leaves they have collected and turn them over to make a print on white drawing paper

2) **Paper Towel Leaves**

Materials: paper towels (or coffee filters) cut into leaf shapes; markers; eye droppers and water or a spray bottle with water.

A) Have the children color their leaf shapes with any or all colors.

B) When done, have them spray (or use eye droppers with water) the shapes.

C) The colors spread

D) Place them on newspaper to dry

3) **Leaf Windsock**

Materials: Large quantity of fall leaves (perhaps from a walk outside With the children!); large construction paper, glue sticks, crepe paper

A) Have the children glue leaves all over their papers. Encourage them to make designs or patterns!

B) Laminate the papers. Roll them into long cylinder shapes. Hole punch a hole on the topsides.

C) Help the children to lace yarn though the two holes you punched on the top. This will be used to hang their Windsocks.

D) Help the children to staple crepe paper to the bottom end.

9) Pinecone activity (separate sheet)

10) Homemade finger paint recipe

Ingredients:

- ½ cup cornstarch
- 2¾ cup cold water
- 1 envelope unflavored gelatin
- ¼ cup cold water

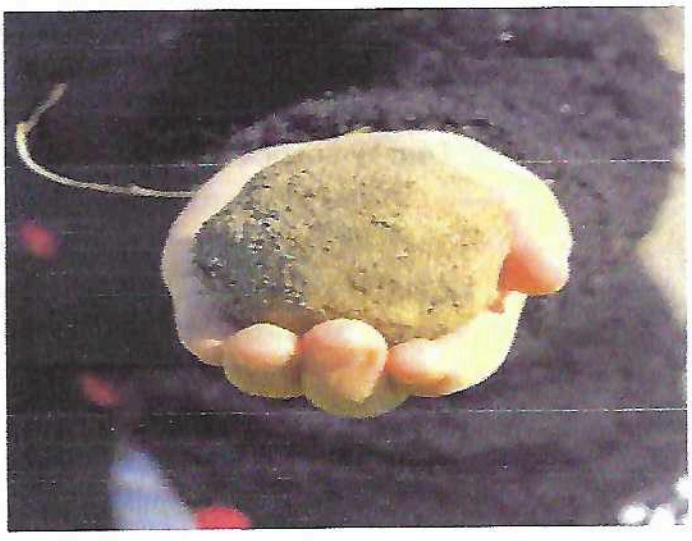
- Small jars with lids for storing your paint (we find it easier to dip the paint out of teacups)
- Food coloring

How we make it:

- Mix cornstarch with 2¾ cups cold water to make a smooth paste in a saucepan until no lumps remain
- Meanwhile soak the gelatin in ¼ cup water to soften until it's needed
- Cook cornstarch mixture over medium heat stirring constantly until mixture boils and turns clear(ish)
- Remove from heat and stir in gelatin mixture
- Cool and divide into several different jars for various colors. Stir in food coloring until you have a pleasing color that is well blended.

This recipe makes about 3 cups of paint.

Mud Dough



To make mud dough, invite children to help mix the following:

1 Cup of dirt
1 Cup of flour
¾ Cup of vegetable oil

Let the children stir the dry ingredients together first, then slowly add oil as the children help stir and squeeze the mixture until desired consistency is reached. Mud dough keeps in an airtight container for 7 to 10 days.

WHY DO PINECONES OPEN AND CLOSE?

Explore these sweet little seed dispensers with this cool experiment!

WHAT YOU'LL NEED:

- Pinecones
- Glass bowls or jars
- Tongs
- Hot and cold water
- Baking sheet

HOW TO DO IT:

1. Head outside and gather some pinecones! Did you know that pinecones come from a variety of trees? Pine trees, spruces and firs, just to name a few. Use a field guide and see if you can match up cones with the trees they come from!
2. Once you have your cones, head inside to get started on science. First, make some observations and predictions. What do the cones look like now? Were they open or closed when you collected them? What was the weather like when you collected the pinecones?
3. Grab a couple glass bowls or jars. Fill one with hot water and one with cold water. What do you think will happen when you put the pinecones in the water?
4. Put the pinecones in the water and observe what happens! Place on the baking sheet to dry and watch what happens next!

Find more fun activities like this one for free at www.academy.animaljam.com

There is a chicken Bingo game and a Chicken Matching game in the library shelf with the Farm Animal Books. I hope they are helpful.

Interesting facts about chickens

Hens communicate with their chicks while they're still inside their eggs! ...
Chickens have a great memory for faces! ...
Chickens are actually omnivores, not herbivores.

Did you know? It is estimated that there are more than 33 billion chickens worldwide! Outnumbering the human population, chickens are one of the most common farm animals.

1. Chickens are living descendants of dinosaurs.

Chickens are the closest living relatives of dinosaurs! Scientific evidence has proven the shared common ancestry between chickens and the *Tyrannosaurus rex*.

2. Chickens aren't completely flightless.

Chickens were domesticated about 8000 years ago, and evolved from the Red junglefowl, which are tropical birds that live in the jungle. These wild birds fly to escape predators and to roost high up in trees. Today's domestic chickens still have the ability to fly, although not as effectively. Chickens can fly for short distances – enough to clear obstacles or reach a perch.

3. Chickens can dream.

Research has shown that chickens experience REM (rapid eye movement) while sleeping, meaning they can dream just like us! They also have a sleep phase that humans don't experience called unihemispheric slow-wave sleep, where one half of the brain is asleep and the other is awake. This means that chickens can sleep with one eye open, which is especially useful for looking out for predators.

4. Chickens have better color vision than humans.

Like humans, chickens have color vision, and are able to see red, green and blue light. However, what makes chicken vision unique from ours is that they are also able to see ultraviolet light, which are the colors you see when using a black light!

5. Chickens have complex communication.

Chickens have over 30 unique vocalizations that they use to communicate a wide variety of messages to other chickens, including mating calls, stress signals, warnings of danger, how they are feeling and food discovery.

6. Chickens have great memories.

Highlighting their long-term memory capabilities, even after being separated for extended periods of time, chickens can recognize over 100 different faces. These faces don't just include chickens, they can recognize the faces of humans too!

7. Chickens bathe by covering themselves in dirt.

While this may seem contradictory, the dirt is essential to helping chickens stay clean! Chickens have an oil gland on their back that is used to spread oil over their feathers to make them waterproof. Over time, the oil goes stale, and chickens need to wash the old oil off through dust bathing. Dust bathing is when chickens crouch on the ground and spread dirt or another dusty material over their body. The stale oil sticks onto the particles of dirt and gets shaken off. Chickens can then spread fresh oil onto their feathers.

8. Chickens have a pecking order.

Chickens live in groups called flocks. The social structure of these flocks depends on a hierarchy called a pecking order, which is an order of dominance. All chickens know their place in this order, and it helps to maintain a stable, cohesive group.

9. Egg shell color can be determined by the hen's earlobe.

Ever wondered what causes the difference between brown and white eggs? It depends on the breed of the hen, but it's not feather color that tells you what color the eggshell will be. It's the color of the hen's earlobes! Generally, hens with red earlobes will lay brown eggs, and hens with white earlobes lay white eggs (with a few exceptions of course). Although the color of the eggs may differ, the nutritional content or flavor does not.

10. Chickens are very intelligent animals.

Studies have shown that chickens are self-aware and can distinguish themselves from others. They learn from one another, such as a chick learning from her mother which foods are good to eat. Chickens can also demonstrate complex problem-solving skills.

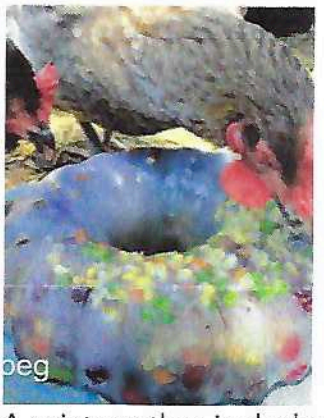
Did You Know: Chickens

The egg formation process takes about 24 hours to complete before the hen can lay her egg.

Some interesting facts about eggs and egg laying:

- The entire egg laying process from start to finish takes between 24-26 hours.
- A hen will take a break from egg laying when the days shorten. She may stop laying completely or just significantly reduce the number of eggs she lays. A hen requires 14-16 hours of daylight for high egg production. [Editor's note: this means that you can artificially increase egg production with UV lamps or other light sources.]
- The color of the egg yolk is dependent upon the hen's diet. If she eats a lot of foods with yellow-orange pigments, her eggs will be a darker yellow or almost orange color.
- An egg that has been fertilized and laid, can remain in a state of suspension, under proper conditions, for approximately 7 days and remain viable to incubate and hatch. After day 7 the hatchability begins to decline. This gives a hen time to accumulate her clutch of eggs, then incubate them so they will all hatch at approximately the same time...within a day or two of one another.
- The average incubation time for a baby chick is 21 days. During this incubation time, a broody hen will only leave her nest once, maybe twice a day for short periods of time to eat and relieve herself. She will eat about 80% less while setting on her eggs.
- A hen will quit laying eggs when she begins incubating her clutch of eggs and will not resume laying again until the chicks are about 5 weeks old. This is also about the time she will begin distancing herself from her brood.
- A hen will lay an average of 265 eggs in a productive year. The first two years are the most productive, with laying tapering off as she gets older. A well cared for hen can provide farm fresh eggs for 5 – 7 years.

- During the winter, chickens need more food to keep them warm. You can add treats that provide additional protein and carbohydrates. Some good ones are:
    A) Wild bird seed mix
    B) Veggie
    C) Salad scraps
    D) A frozen ring filled with vegetables



E) A mixture that includes:
   1) ½ cup Crushed corn (High in nutrients and easily digestible)
   2) ½ cup Black Oil Sunflower seeds (High in protein vitamins, and minerals)
   3) 1 tsp. cinnamon (Multiple health benefits)
   4) 1 tsp Crushed red pepper (Deworming properties)
   5) 1 tsp Probiotic powder (Aids in digestion)
   6) 1 Tbs Minced garlic (Boosts the immune system, natural wormer, keeps the bugs away)
   7) You might also add:
      a) Grass clippings
      b) Roses,
      c) Marigold
      d) Dandelion
      e) Daisies
      f) Clover
      g) Fresh or dried fruit
      h) Fresh vegetables like leafy greens, watermelon, pumpkins, broccoli, bananas, sweet potatoes, tomatoes, cabbage, cooked carrots, squash, berries,
      Melons, grapes, apples
      i) Rolled Oats (Raises metabolism and keeps them warm)

- **DO NOT** give them any:
   A) processed foods
   B) foods that contain salt or sugar
   C) Avocados
   D) Onions
   E) White potatoes
   F) Anything moldy
- Reasons to give chickens treats include:
   A) To break up the monotony of their diet

B) It is good to offer foods with beneficial vitamins and minerals.

C) To cool them off in the summer and warm them up on a cold, winter day

- Chickens will overheat before they will drink warm water. Adding ice to their water or ice with veggies frozen in it, are good ways to keep chickens happy.

Chickens need to play!

Why Are Chicken Toys Important?

A chicken that is not provided with adequate enrichment and mental stimulation will be more inclined towards problem behaviors. Feather pecking, bullying, and egg-eating. The cold winter months that necessitate closer quarters and fewer foraging opportunities are when chicken toys become even more necessary to avoid coop boredom. This is where the expression "feeling cooped up" comes from after all.

- Old stump or branch full of bugs, grubs, and other creepy crawlies. This works for any piece of wood. Just leave it in one place for a few days to a week or so and let the bugs seek refuge under it – then just flip it over and let the flock go to town.
- Shredded newspaper
- Cricket tubes (or just let crickets loose in the coop when they will be confined for an extended period of time). You can find these at most pet stores or tackle shops.
- Sunflower heads complete with seeds
- A post-Halloween jack-o-lantern or any large squash or melon. Just drop it on the ground from high enough that it splits and let them do the rest.
- Suet cage or fruit basket stuffed with table scraps
- Old CDs that are scratched beyond repair are great hung from a string along the fence of the run at or just above pecking height. If you are REALLY adventurous you can blow up a balloon, smash the cd's and then glue them onto the balloon in a mosaic pattern and hang it in the run/coop to catch the light.
- Boiled spaghetti is a special hit. Dye the noodles in different colors for added fun.
- DIY bird feeders. Just do a Google search and you'll come up with thousands of ideas. Just use scratch grains or BOSS or whatever else you have on hand. Molasses is a great tool for creating enough structure to hold it together enough for them to peck it to death.

Use your imagination and have fun. If it encourages their natural behaviors of eating, scratching, pecking, bathing, flying, perching, or flock socialization then it is a good toy and will provide your chickens hours of entertainment. They don't have to be pretty and they don't have to cost anything. If they don't like it you can always take it away and try again another time, or move on to the next item. Enjoy your flock!

The Naked Egg experiment – Steve Spangler

This experiment answers the age-old question, "Which came first, the rubber egg or the rubber chicken?" It's easy to make a rubber, or "naked," egg if you understand the chemistry of removing the hard eggshell. What you're left with is a totally embarrassed, naked egg and a cool piece of science.

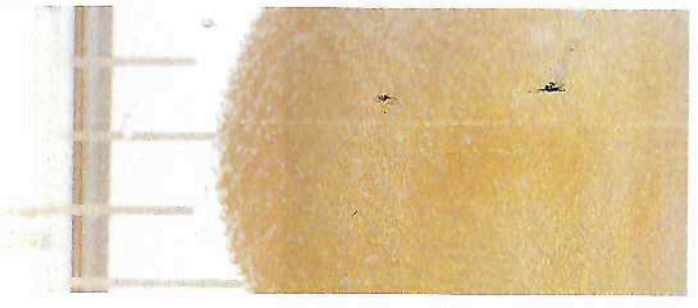
Here's What You'll Need

- Raw eggs
- Large glass or container
- Vinegar
- Patience
- Adult supervision

Let's Try It

1. 

   Place the egg in a tall glass or jar and cover the egg with vinegar.

2. 

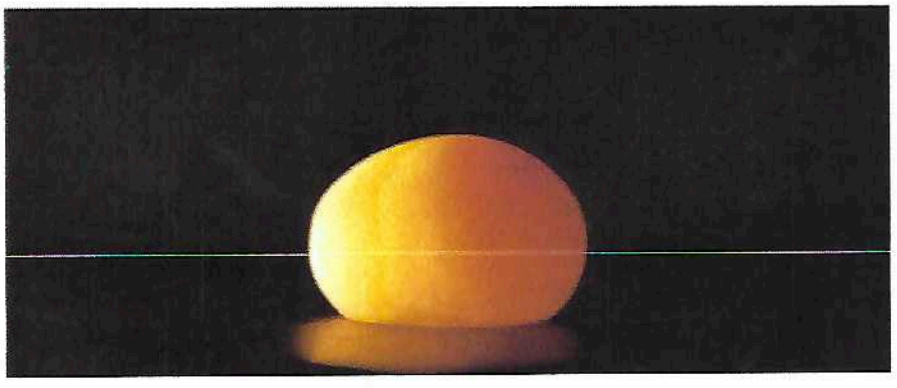
   Look closely at the egg. There will likely be tiny bubbles forming on the shell.

3. 

Leave the egg in the vinegar for a full 24 hours.

4. 

Change the vinegar on the second day. Carefully pour the old vinegar down the drain and cover the egg with fresh vinegar. Place the glass with the vinegar and egg in a safe place for a week—that's right, 7 days! Don't disturb the egg but pay close attention to the bubbles forming on the surface of the shell (or what's left of it).

5. 

One week later, pour off the vinegar and carefully rinse the egg with water. The egg looks translucent because the shell is gone! The only thing that remains is a delicate membrane of the egg surrounding the white and the yolk. You've successfully made an egg without a shell. Okay, *you* didn't really make the egg (the chicken made the egg), you just stripped away the chemical that gives the shell its strength.

Floating Egg Science Experiment

Can you make an egg float in water? In this simple science experiment, we take just a few minutes to test the laws of density and discover just how easy it is to make an egg float!

Below you'll find detailed instructions and our demonstration video as well as the scientific explanation of "why it works." We've also included a more ideas to explore the concept a bit further.

Floating Egg Science Experiment Instructions

Experiment Setup – Start with some observations about the eggs. Note that they are both raw eggs and have a similar size and weight. Then ask some questions. Do you think that the eggs will sink or float when placed in water? Do you think it's possible to make them float? If so, how? Write down your hypothesis (prediction) and then follow the steps below.

Step 1 – Fill a tall drinking glass about 3/4 full of water and carefully place the egg into the glass. What happens to the egg? That's right, it sinks to the bottom.

Did you know there is a way to make it float? Continue on in the experiment to find out how.

Step 2 – Fill another tall drinking glass about 3/4 full of water.

Step 3 – Add 3 Tablespoons of salt to the water and stir until it is completely combined. What do you think will happen if you place the egg into the glass with the salt water? Write down your hypothesis (prediction) and then test it to see if you were right.

Step 5 – Next carefully place the second egg into the glass with the salt water. What happens to the egg? That's right, it floats. Take a moment to make some observations. Why do you think one egg sinks and the other egg floats?

How Does the Floating Egg Science Experiment Work

Why does the egg sink in regular tap water, but float in saltwater? The answer lies in the density of water!

Density is a measure of the mass per unit volume of a substance. Simply said, how much "stuff" in a given volume. Water has a density of 1 g/mL (g/cm3). Objects will float in water if their density is less than 1 g/mL. Objects will sink in water if their density is greater than 1 g/mL.

The egg will sink in regular tap water because the density of the egg is greater than the density of water. The egg's density is only slightly higher than water at 1.03 g/mL, but that is enough to make the egg sink.

When you add salt to the water, you are increasing the density of the water by adding more mass (or stuff) in the given volume. You don't really change the volume of the water by adding salt. By adding enough salt, you increase the density of the water so that it is higher than the density of the egg and the egg will float!

Other Ideas to Try

Try this experiment again, but instead of using an egg use a potato slice or a carrot slice. You will have to play around with the amount of salt you add to the water because all objects have their own unique density. Add salt a tablespoon at a time and mix well until you cannot see any salt in the solution, then add your object to see if it floats or sinks. Remove your object and keep adding salt until you can get your object to float. To make it a true science experiment, create a data table to keep track of how much salt you add to the solution.

How to Tell if an Egg is Hard-Boiled or Raw

- Spin the egg on a flat surface and stop it suddenly with your index finger. If it stays still, it's hard boiled, but it's raw if it continues to wobble.
- Shine a flashlight through the egg. A hard-boiled egg will look dark and opaque, but a raw egg up will light up.
- Put the egg in hot water. Raw eggs produce a stream of air bubbles and boiled eggs don't.
- Shake the egg gently. A hard-boiled egg feels solid, but the weight will shift inside if it's raw.

Spin Test

1) **Spin the egg on a smooth, flat surface.** Set the egg on its side on a cutting board or countertop. Pinch the egg between your fingers and spin it like it's a top so it's moving at a steady pace.
2) **Check if the egg is steady or wobbly while it's spinning.** Carefully watch how the egg moves after you spin it. If the egg spins quickly and steadily like a top, the egg is hard boiled. If it spins slowly, has a major wobble, or doesn't spin at all, the egg is still raw.

    - A boiled egg spins at a consistent speed because the solid whites and yolk make its center of gravity stable.
    - The liquid whites and yolk inside a raw egg shift around as the egg spins, so it throws off the balance more.

3) **Stop the egg quickly.** While the egg is still going at full speed, quickly place a finger down on its center to make it stop. Once the egg comes to a stop, immediately remove your finger.

    - Press hard enough to stop the egg within 1–2 seconds, but don't press so hard that you accidentally break the shell.

4) **Check if the egg starts spinning again to see if it's raw.** If the egg stays still after you lift your finger, then you have a hard-boiled egg. However, a raw egg will start slowly spinning again after you stop it.

    - Why does a raw egg keep spinning? Since the whites and yolk are liquid, they're still spinning inside the shell. The egg's center of gravity shifts as the liquid contents move around, causing the egg to keep moving.

Ideas for Chicken Matching Games

Materials included:

1) Set of picture cards
2) Set of picture cards with a description of the pictured chicken
3) Set of chicken description cards

Game One:

Use both the set of picture cards and picture cards with descriptions.

1) Give each child a picture card.
2) Hold up one of the picture cards that has the description on the back.
3) Have the child who has the matching picture card hold it up or return it to you. There are duplicates so for some of them, two children will have the same one.

Game Two:

Use the set of description cards and picture cards.

1) Give each child a picture card (there will be duplicates).
2) Read the description on your card and see if the child can make a match from your description. Have him hold up his card to see if it is correct.

Game three:

Use your imagination!

Cornish
Characteristics you can see:
Smooth white or brown feathers
Thick, heavy body
Small, white, eggs
Characteristics farmers look for:
Very good for meat
Fast growing
Poor egg production so they are mostly raised for meat

Cochlin
Characteristics you can see:
Very thick, fluffy feather give the body a round appearance
Feathers cover legs and feet
Many colors including white, brown, and multi-colored
Medium brown eggs
Characteristics farmers look for:
Low egg production
Typically raised for show or hobby

Cochlin
Very thick, fluffy feather give the body a round appearance
Feathers cover legs and feet
Many colors including white, brown, and multi-colored
Medium brown eggs
Characteristics farmers look for:
Low egg production
Typically raised for show or hobby

Rhode Island Red
Characteristics you can see:
Smooth reddish-brown feathers
No feathers on legs or feet
Large brown eggs
Characteristics farmers look for:
Very good egg layers!

White Leghorn
Characteristics you can see:
Smooth, white feathers
No feathers of feet or legs
White, large eggs
Characteristics farmers look for:
Very good egg laying chickens

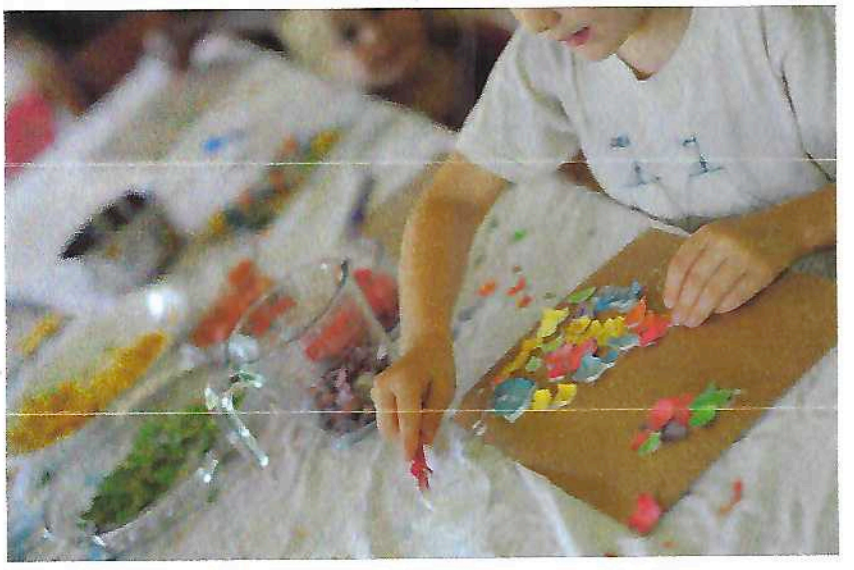
Plymouth Rock
Characteristics you can see:
Smooth feathers
Feathers are black & white and appear like stripes
No feathers on legs or feet
Large body size
Large Brown eggs
Characteristics farmers look for:
Good egg layers

Polish Crested
Characteristics you can see:
Smooth feathers on body
"Crest" of feathers on the head
No feathers on legs or feet
Many colors including black, brown, 7 multi-colored
Medium white eggs
Characteristics farmers look for:
Low egg production
Typically raised for show or hobby

Silkie
Characteristics you can see:
Small, fluffy, feathers appear like silk
Feathers in a ball on their heads and covering their head
Many colors including white, brown, and black
Small, brown eggs
Characteristics farmers look for:
Low egg production
Typically raised for show and hobby

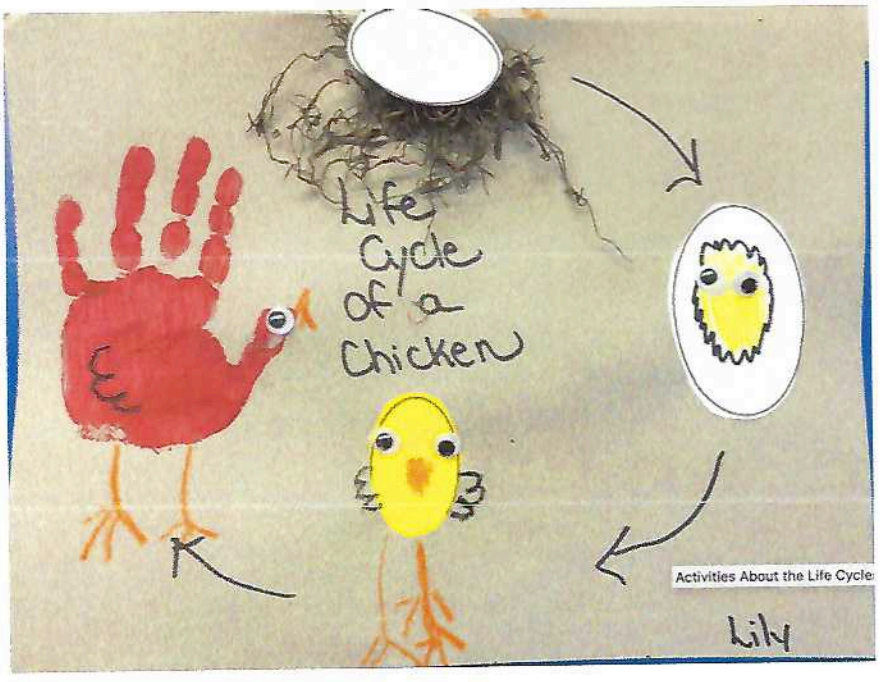
Sussex
White feathers on body, black feathers on neck and tail
No feathers on legs or feet
Large, brown eggs
Characteristics farmers look for:
Good egg layers

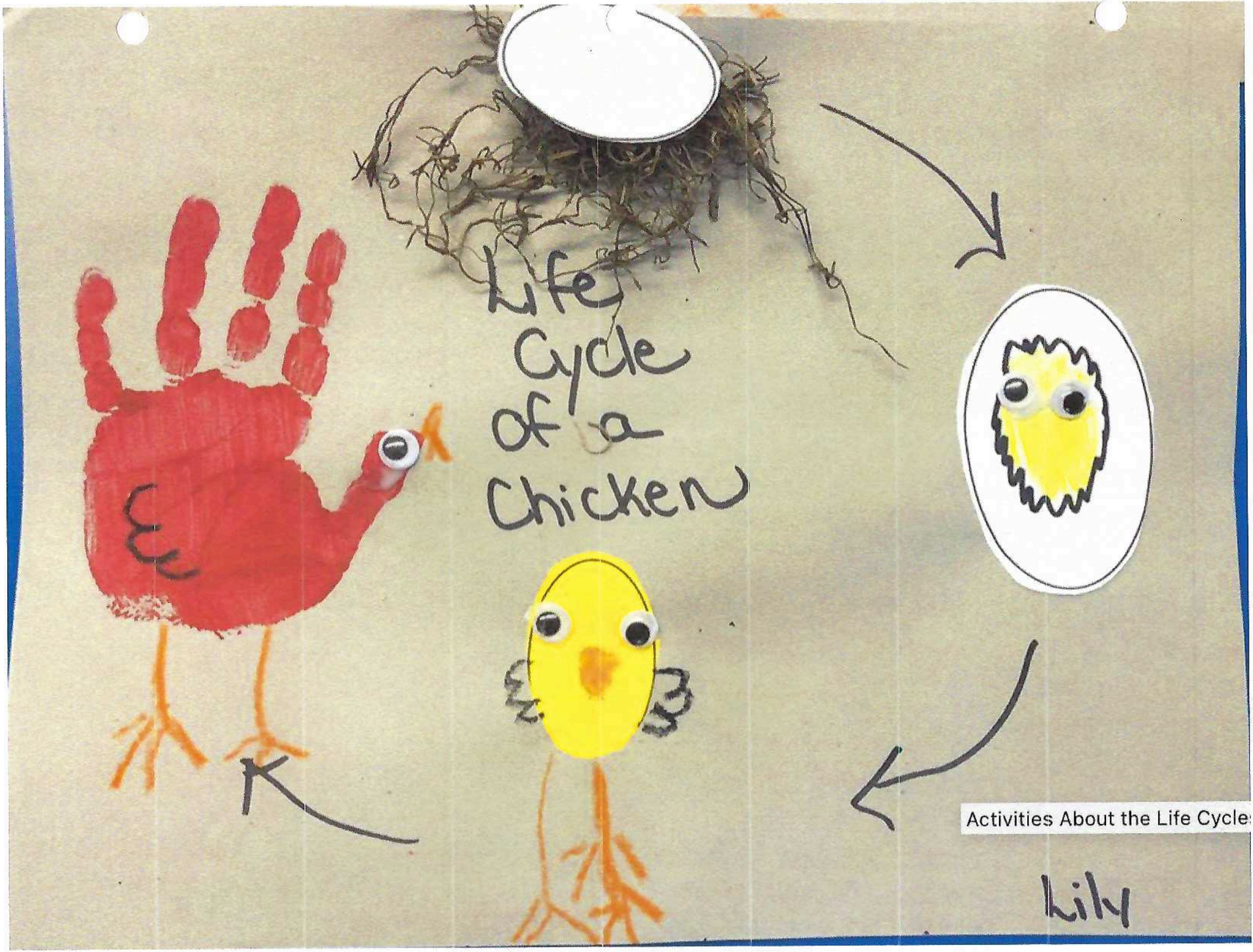
Eggshell Mosaic



Take broken chicken eggshells, dye them with food coloring, and have your students arrange them into a masterpiece. They can try and craft a chicken shape or try their hand at making something more abstract.

Life Cycle of a Chicken Craft




Life Cycle of a Chicken
Activities About the Life Cycle
Lily

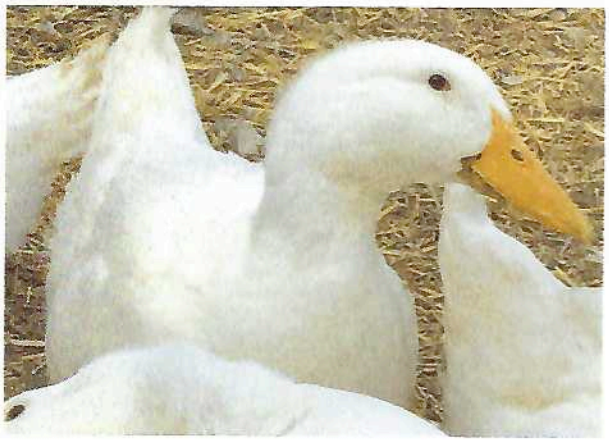
Vanishing Egg Experiment

The vanishing egg experiment is a science activity where an eggshell dissolves in vinegar, leaving behind a "naked" egg with a membrane intact. This is a classic demonstration of an acid-base reaction where the acetic acid in vinegar reacts with the calcium carbonate in the eggshell. How it works:

1. **Materials:** You'll need an egg, white vinegar, and a container.
2. **Setup:** Place the egg in the container and pour enough vinegar to cover it.
3. **Reaction:** As the vinegar reacts with the eggshell, you'll see bubbles forming (carbon dioxide gas).
4. **Dissolution:** Over time, the vinegar dissolves the eggshell, leaving behind a "naked" egg with the membrane intact.
5. **Observation:** You can observe the egg shrinking, the shell dissolving, and the membrane becoming more apparent.

A Duck's 5 Senses

Whenever I go out to feed and visit with my ducks, there is one that inevitably gives me this cute little head-cocked, sly look. I wonder what's going through her mind as she stares at me. Is she wondering if I have more treats than what I'm sharing, or does she suspect me of being a wolf in people's clothing? She doesn't seem to be afraid, just watching. Sizing me up. Taking it all in. This silly little duck got me wondering about the senses that a duck uses to navigate in their world…so I did some research.



I think that all animals rely on the same 5 senses for survival that people do: sight, hearing, smell, taste, and touch. Because they live in the wild and some animals are predators and some are prey, different senses are more developed than others. Ducks are considered prey animals. They make a tasty meal for predators like skunks and raccoons, and people too. I suppose ducks know instinctively that they are prey animals and that they need to be especially watchful of danger. I know that I got these guys from the feed store when they were young, and I didn't teach them about Stranger Danger. They seem to have a vast amount of cautious curiosity. When investigating, they always go as a group, talking, sharing the experience, warning one another about things they are unsure of, and heading the other direction when spooked or frightened. What senses does a duck rely on the most for safety and survival? Let's take a look.

Sight. A duck's sight seems to be their most important sense. A duck's eyes are set on the side of their head giving them a wide field of vision, for example Mallards can see 360 degrees. That's all the way around. Most ducks can see almost in a full circle, but each eye sees a different part of the landscape, providing an increased awareness of their surroundings, panoramic vision. The downside to this is a decrease in depth perception. To compensate, you will notice ducks moving their heads from side to side and up and down rapidly. This helps to create more of a 3-dimensional picture for the duck. People look forward, with both eyes focusing on the same things. Can you imagine seeing one side of the road with one eye and the other side of the road with the other eye, and then trying to process that view?

Ducks also have powerful eye muscles that allow them to control the curvature of the cornea and the lens, increasing the refractive power of both, which means that they can see two to three times further than humans can, suggesting that sight is the duck's most powerful sense. They can see a lot further than they can hear. Ducks have highly developed retinas. The vast number of cone receptors allow the duck to form a crisp image of a predator during the day. The trade-off however, is poor night vision. This is why they settle into some safe place: bushes, tall grasses, barns or coops, before the sun goes behind the mountains.

They also have a high concentration of blood vessels in the retina that provides superior sensitivity to motion. Ducks see the colors red, green, yellow and blue, more vibrantly than people do, and because of an extra cone, they are also sensitive to ultraviolet rays. This gives them exceptional light sensitivity and they are adept at spotting unnatural reflections. If you happen to be a duck hunter, this is especially good to know as movement and reflection will give your position away in a heartbeat!

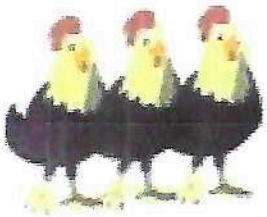
Hearing. A ducks ears are located on the sides of their heads, a little behind and below the eyes. The do not have any outward appendages, only some soft feathering to cover the ear openings and offer protection, so they are a little hard to spot. Hearing is probably the second most important sense. Even before a duckling has hatched, they listen for the sound of their mom's vocalizations so that they will recognize her and be able to respond to her directions and warnings. It is important to their survival that ducks be able to differentiate between various calls such as alarm calls versus mating calls, or the sound of a potential meal versus predator. They are also able to perceive whether a sound is above, below or right next to them. I believe that my ducks can hear me in the morning and evening when I walk out the garage door at feeding time. I also believe they can differentiate between my footsteps and the footsteps of those who do not feed them. They tend to vocalize quite loudly when they recognize me!

Smell. A duck has two nostrils high on their beak. They use their sense of smell to differentiate foods, mates, maybe even their young. Their sense of smell is believed to be one of the least developed senses and it hasn't been studied very much. I can't say that I really notice my ducks wandering around with their nose/beaks in the air sniffing for food, or danger, but maybe they can recognize the scent of a skunk and know it's time to be extra careful.

Taste. The duck's sense of taste is not thought to be a highly developed sense either. It is known that the more taste buds that you have, the better your sense of taste. Waterfowl have only about 400 taste buds, compared to the 9,000 taste buds that a human has. Watching my ducks eat, they consume their food so quickly that I don't know how they really have a chance to taste it. Ducks do however, seem to have an innate ability to identify what foods are good and nutritious to eat and what foods to avoid. I wonder if some of this ability has to do with smell and taste.

Touch. The sense of touch is important to ducks in foraging for food. They are considered tactile feeders and they use their bills, which have highly sensitive nerve endings, to search for food in murky water and mud puddles where their vision is not too useful. Touch also helps ducks determine temperature, distinguish different textures and recognize other physical stimuli. Ducks do have fewer nerve endings in their feet which allow them the ability to withstand walking in snow or swimming in icy waters.

Collective Nouns For Birds



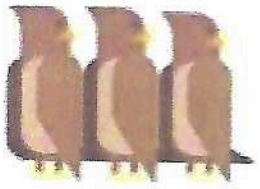
A brood of chickens

A brood of hens

A cast of falcons

A colony of gulls

A colony of penguins



A colony of vultures

A company of parrots

A convocation of eagles

A dole of doves

A dopping of goosanders

A flight of birds

A flight of cormorants

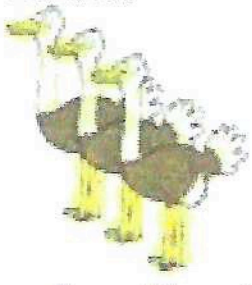
A host of sparrows

A mews of hawks

A murder of crows

A mustering of storks

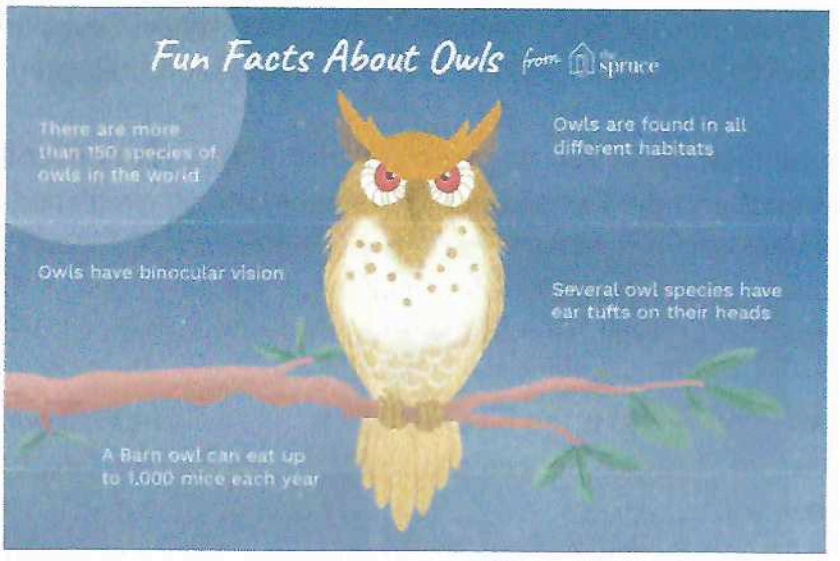
A stand of flamingos



A pride of ostriches

A pod of pelicans

A parliament of owls



There are 8 species of Owl in Massachusetts:

- Barn Owl.
- Eastern-screech Owl.
- Great Horned Owl.
- Snowy Owl
    - Snowy Owls are white owls found largely in the Arctic. They have golden colored eyes and brown specks throughout their feathers. As the owls grow older, they begin to lose the darker specks of color in their feathers. Most owls are nocturnal or are active at night. Snowy Owls hunt during the day, however. These big birds are remarkably interesting animals! They also make a beautiful subject for an art project. They can be found in the Northeast in the winter. A group of Snowy Owls is called a **blizzard**.
- Barred Owl.
- Long-eared Owl.
- Short-eared Owl.
- Northern Saw-whet Owl.

A) Owls have unique eyes. They have something called **binocular vision**. They have to turn their heads almost completely around to see the world around them. This unique owl eyesight keeps them from seeing well from side to side.
B) Most owls are **nocturnal**. They hunt at night.
C) Owls are **raptors** which are birds of prey.
D) Many owl species have asymmetrical ears. When located at different heights on the owl's head, their ears are able to pinpoint the location of sounds in multiple dimensions. Ready, aim, strike.

E) The eyes of an owl are not true "eyeballs." Their tube-shaped eyes are completely immobile, providing binocular vision which fully focuses on their prey and boosts depth perception.

F) Owls can rotate their necks 270 degrees. A blood-pooling system collects blood to power their brains and eyes when neck movement cuts off circulation.

G) A group of owls is called **a parliament**. This originates from C.S. Lewis' description of a meeting of owls in The Chronicles of Narnia.

H) Owls hunt other owls. Great Horned Owls are the top predator of the smaller Barred Owl.

I) The tiniest owl in the world is the Elf Owl, which is 5 - 6 inches tall and weighs about 1 ½ ounces. The largest North American owl, in appearance, is the Great Gray Owl, which is up to 32 inches tall.

J) The Northern Hawk Owl can detect—primarily by sight—a vole to eat up to a half a mile away.

K) Barn Owls swallow their prey whole—skin, bones, and all—and they eat up to 1,000 mice each year.

L) Northern Saw-whet Owls can travel long distances over large bodies of water. One showed up 70 miles from shore near Montauk, New York.

M) Not all owls hoot! Barn Owls make hissing sounds, the Eastern Screech-Owl whinnies like a horse, and Saw-whet Owls sound like, well, an old whetstone sharpening a saw. Hence the name.

N) Owls are **zygodactyl**, which means their feet have two forward-facing toes and two backward-facing toes. Unlike most other zygodactyl birds, however, owls can pivot one of their back toes forward to help them grip and walk.

O) The flattened facial disk funnels sound to the bird's ears and magnifies it as much as ten times to help the owl hear noises humans can't detect. Different owls have different facial disk shapes.

P) Bony eye sockets support an owl's eyes, and they cannot turn their eyes. Instead, owls rotate their heads up to 270 degrees (135 degrees to either side), but they cannot turn their heads all the way around.

Q) An owl has three eyelids: one for blinking, one for sleeping, and one for keeping the eye clean and healthy.

R) Owls are **carnivorous** and will eat rodents, small- or medium-sized mammals, nocturnal insects, fish, and other birds, including smaller owls. After digesting their food, owls regurgitate hard pellets of compressed bones, fur, teeth, feathers, and other materials they couldn't digest. Ornithologists study those pellets to learn more about an owl's diet.

S) Females are larger, heavier, and more aggressive than males for most owl species. If the birds are **dimorphic** or have a different appearance between males and females, the female is often more richly colored than the male.

T) Baby owls are called **owlets.**

U) Owls grab their prey with their sharp claws

Owl Crafts:  

1) Owl babies craft

Materials:

- Black Construction paper
- Gold/yellow or orange construction paper
- Scissors
- Glue Stick
- White glue or Hot glue
- Forks
- White Paint
- Brown Paint
- Paint Brush
- Stick

Directions:

1. Place black construction paper on the table. Pour about an inch in diameter of white paint in the middle of your paper.
2. Use a fork to scrape the white paint in all directions. Turn the paper as you scrape. This will help distribute the paint. Be careful not to tear the paper with too much pressure on the fork.
3. Add another inch diameter of paint to the left and down from your first pour. Scrape similarly, in all directions, to the first pour.
4. Use the blunt end of a paint brush to create brown specks in your owl along the underside of the face and along the owl feathers on the body. Dip your brush end in brown paint and dab on the owl.
5. Paint on your beak with the brown paint. Set your owl off to the side.
6. While your paper is drying, make the eyes.

Paper Towel Tube Owl

Materials:

- Toilet paper rolls
- Washable paint
- Googly eyes
- Hot glue gun
- Craft feathers or coffee filters
- Tops of broken yellow crayons (I always keep our broken ones for crafting), dried corn kernels, or Captain Crunch cut diagonally for the beaks

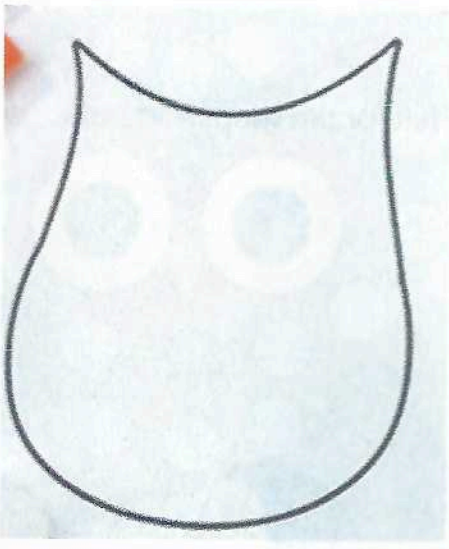
Procedure:

- Children paint their toilet paper rolls.
- When close to dry, fold the top of the roll down, and put a bit of glue on it.
- Next, fold the other half on top of the glue to make the top of the owl look Great Horned.
- Then, put two small drops of glue on the owl's face for the eyes.
- Secure the beak and put the feathers on.

Handprint owl:

Supplies:

- white paper (Card stock would work well)



- jumbo googly eyes
- two brass fasteners
- scissors
- white school glue
- glue stick
- markers
- cotton balls

Directions:

1) Cut out the body shape
2) Trace two handprints and cut them
3) Use two brass fasteners to attack the wings to the owl shape
4) Add eyes and a beak

This Is A Craft: Snowy Owl

From Family Fun magazine

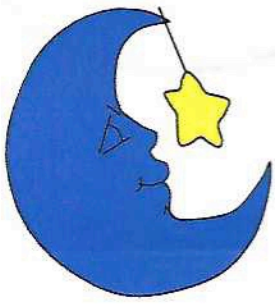
All you need are:

- ponderosa pinecones (regular, collected ones would be fine)
- 5 cotton balls shred into pieces
- googley eyes
- white and brown pipe cleaners or felt for the wings and beak
- Tacky glue

Circle activities:

Five Little Owls

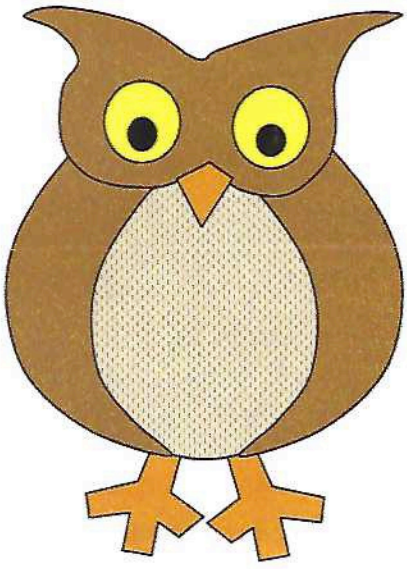
by Leanne Guenther



Five little owls,
On a branch by the shore,
A squirrel scampered by,
And then there were four.

Four little owls,
Perched high up in a tree,
The wind shook one off,
And then there were three.

Three little owls,
With nothing fun to do,
One got very bored,
And then there were two.



Two little owls,
Just having some fun,
A bear came along,
And then there was one.

One little owl,
Winked at the setting sun,
Flew into the forest,
And then there were none.

Owl Fine Motor Cover-Up

Instructions: Print on cardstock paper and laminate. Children can use a variety of objects to cover up the blank circles on the owl. Use supervision with small objects.

buttons
playdough
magnets
pom poms
bingo daubers or do-a-dot markers
stickers
flat glass beads

You can also have the children roll a dice and do a count and cover activity.

childcareland.com

This gameboard is in the back pocket of your binder.

Owl Pellet Dissection Activity

Dissecting a pellet isn't a yucky activity; pellets are dry and very unsmelly - and iyou can buy heat treated **sterilized** ones.

What You'll Need

1. Tweezers to help with dissection
2. White paper
3. Pellets
4. Magnifying lens (optional)

Owl Pellet Bone Chart

	Rodent	Shrew	Mole	Bird
Skull				
Jaw				
Scapula				
Forelimb				
Hindlimb				

1. Begin the pellet **dissection** activity by getting the children to place a pellet on some white paper.
2. Gently tease apart into **four quarters** using your fingers. **Tip**: Don't rush; lots of the bones are small and buried deep in the fur.
3. Use **tweezers** where necessary to help with your dissection by pulling out the bones and discarding the fur.

- Lay out the bones from the activity and compare them with your owl **dissection chart**.
- Try to identify as many of the bones from the dissection as possible using the bone chart.
- If you can, try to **reconstruct** a complete skeleton out of the dissection.
- N.B. **Wash hands** at the end of this activity lesson.

		Owl books in our library	
Tejima	Owl Lake	As the sun slips down behind the lake and the sky darkens, Father Owl comes out and hunts for fish to feed his hungry family. Illustrated with the author's woodcuts.	OWLS
Yolen, Jane	Owl Moon	A young girl and her father take a nighttime stroll near the farm where they live to look for owls. It is a beautiful night, a moonlit winter night. Bundled tightly against the cold, they trudge through the pristine snow, "whiter than the milk in a cereal bowl." As they go, hidden in ink-blue shadows, a fox, a raccoon, a field mouse and a deer watch them pass. A delicate tension builds as the father imitates the great horned owl's call once without answer, then again. Finally, from out of the darkness "an echo/came threading its way/through the trees."	OWLS/Family
Modarressi, Mitra	Owlet's First Flight	Little Owlet wakes on a moonlit night. His mama says, "It's time you took flight." This little Owlet does not want to be out by himself in the dark. But Mama believes he can be brave, so he decides to leave the nest for the first time.	OWLS
Townsend, Emily Rose	Owls	Photographs introduce owls along with their physical and behavioral characteristics.	OWLS
Marsh, Laura	OWLS	National Geographic informational	OWLS
Charleworth, Liza	OWLS	Scholastic informational	OWLS
Loates, Glen	OWLS	Looks at the characteristics and behavior of owls, describes different kinds of owls, and discusses owl conservation	OWLS
Corderoy, Tracey	The Little White Owl	One day, a little white owl sets off to see the world. When he meets some beautiful, colorful owls, he can't wait to share his toast and all of his happy stories. But these pretty owls do not want to be friends with a plain little owl like him.	OWLS
Pfister, Marcus	The Sleepy Owl	Looking for a friend and finding a little boy. They tried to work out the differences in their sleeping patterns.	Animals/ owls 1
Metzger, Steve	Wise Up, Silly Owl!	Owls are supposed to be wise, but young Spotty Owl doesn't want to be wise. He wants to be silly! Father Owl, who is truly wise, wonders when Spotty will finally grow up and use his wisdom to help the other forest animals.	OWLS/Family

Frogs in Massachusetts – Mass Audubon

Frogs are a familiar part of the wildlife of Massachusetts, and they're found all across the state. Because of their diverse habitat needs and sensitive skin, these amphibians are good indicators of the health of our environment. There are 10 frog species in the Commonwealth, and one, the Eastern Spadefoot Toad, is listed as Threatened under the state's Endangered Species Act.

Identification

Frogs tend to have bulging eyes and long back legs that help them hop, climb, or swim. They're amphibians, so they rely on their environment to warm or cool them and tend to lay their eggs in water.

All frogs belong to the order Anura, which means "no tail" in Latin. Toads are frogs; people have used the term toad for various unrelated species and groups of frogs. One group, the true toad family Bufonidae, has members with large poison glands behind their eyes, shorter legs, and dry, typically warty skin.

Types of Frogs in Massachusetts

The frogs of Massachusetts come in many colors, and they inhabit a variety of habitats, from lakes to trees to woodlands. The 10 species in Massachusetts belong to four scientific families.

Five species, including the familiar American bullfrog, belong to the family Ranidae, the true frogs. Two species are members of the true toad family Bufonidae. Two belong to the family

Hylidae, the tree frogs and allies. One frog is a member of the Scaphiopodidae family of American spadefoot toads.

American Bullfrog (*Lithobates catesbeianus*)

This is our largest frog. It has a green face and a green-brown body. A ridge of skin runs from its eye curving around its external eardrum (tympanum). Found statewide, it inhabits permanent bodies of water such as ponds and marshes, and eats almost anything it can grab. You can hear its deep "jug-a-rum" call in late spring and summer. It lays its eggs as a film on the water's surface.

American Toad (*Anaxyrus americanus*)

A member of the true toad family Bufonidae, this common species can range from pale olive to tan to brick red to almost black, with large warts often surrounded by black spots. It can often

be found on the forest floor, eating small creatures such as slugs and worms. Its long trilling call is heard in spring and summer. In spring or early summer, it drapes its long, spiraling strings of eggs over submerged vegetation. It's found across the state, except on Nantucket and Martha's Vineyard.

Eastern Spadefoot (*Scaphiopus holbrookii*)

This brownish animal is often called a spadefoot toad, though it's not related to the true toads. It has yellow stripes, small warts, and catlike pupils. The term spadefoot comes from the hard digging structures on its hind feet. Rarely seen, it spends much of its time underground or hunting for small prey at night. After a strong rainfall event during the warm months, it breeds in shallow temporary pools. It's mostly found in the Connecticut River Valley and on Cape Cod. Learn more about our work with spadefoot toads

Status: Threatened in Massachusetts; under the Massachusetts Endangered Species Act it is illegal to kill, harass, or possess this animal.

Fowler's Toad (*Anaxyrus fowleri*)

Another so-called true toad, this species looks a lot like the American toad. However, it has clusters of three or more small warts enclosed by dark splotches, a mostly spotless belly, and paratoid glands that meet at the back of the eyes. It's found in sandy areas near wetlands, and the female lays long strings of eggs in permanent water. Listen for the high-pitched "wahhh" call in spring and summer. It lives throughout the state except on Nantucket and Berkshire County.

Gray Treefrog (*Hyla versicolor*)

A master of camouflage, this gray-brown frog blends in with the tree bark on which it perches. Its call, heard from spring through summer, is a short, high-pitched trill. It lays loose masses of 30-40 eggs along the shores of ponds. Young frogs are bright green. Find it everywhere but Dukes and Nantucket Counties.

Green Frog (*Lithobates clamitans*)

This is one of our most familiar frogs and is found statewide. It can range from dark brown to bright green, with a ridge running down each of its sides. This species prefers permanent or semi-permanent water bodies, eating whatever it can grab, from insects to snakes to birds. The call is a banjo-like "gunk," and the female lays a thousand or more eggs at a time as a film on the water's surface.

Northern Leopard Frog (*Lithobates pipiens*)

Named for its pattern, this vibrant frog has dark spots outlined in a lighter color. It relies on a diversity of habitats, breeding in marshes and floodplains, hunting in fields, and wintering in permanent water bodies. In spring it makes a rattling, grunting call and lays dark masses of eggs. Look for this frog statewide except for Barnstable, Dukes, and Nantucket Counties.

Pickerel Frog (*Lithobates palustris*)

This species looks much like a leopard frog, but with more parallel angular spots arranged along the back and with bright yellow under its waist and down its thighs. Found statewide, it inhabits ponds, wetlands, and slow-moving streams, breeding in spring and making a snoring call.

Spring Peeper (*Pseudacris crucifer*)

A small, round frog with a dark mask, it often has a brown cross on its back, which led to the species name *crucifer*, meaning "cross-bearer". This frog inhabits wooded areas near wetlands and ponds all across Massachusetts. In the spring it makes a loud, high-pitched peeping call to attract a mate. The eggs are laid singly or in small groups on underwater vegetation.

Wood Frog (*Lithobates sylvaticus*)

This masked frog looks somewhat like a much larger spring peeper but look for the ridges running down the sides and no pattern on the back. True to its name, it lives in forests, breeding in temporary, or vernal, pools. It attracts mates with a quacking call, and the female lays fist-sized masses of eggs. Find this species everywhere but in Dukes and Nantucket Counties.

Behavior

Frogs can be surprisingly vocal. They make calls for a variety of reasons, including attracting mates, telling competitors to back off, and expressing alarm. The calls are valuable identification clues.

Many creatures eat frogs, including herons, northern water snakes, minks, raccoons, and more. Frogs use several strategies to avoid predators. They may leap away, produce distasteful or even poisonous chemicals, hide underground, and/or or use camouflage colors.

Life Cycle

Frogs generally breed in wetlands. Their mating behavior, called amplexus, involves the male grasping the female and fertilizing her eggs as she releases them. The jelly-like eggs are deposited singly or in masses on underwater plant material or in free-floating films.

When the young hatch, they are tadpoles, breathing through gills and swimming with the help of a flattened tail. Over time they develop legs, lose their tail, and breathe air.

Food

Most tadpoles eat aquatic plants and detritus, but some consume animal prey such as small fish. Adult frogs are important predators of insects. Large frogs may eat other small animals such as mammals, amphibians, and fish.

Fantastic frogs – San Diego Zoo

Ribbit! Creak-creak-creak. Peep-peep-peep-peep. CROAK! Rraak, rraak, rraak. Rruum-rruum. Cu-tuck, cu-tuck, cu-tuck. Gunk-GUNK!

Those are just some of the sounds that male frogs make—each species has its very own song. It's usually the males that are making all the noise, saying, "Hey ladies, I'm over here!" or "Stay away guys, this is MY territory!"

Froggy facts

Frogs also come in many sizes and colors. style The smallest ones are about the size of a pea, while the biggest, the goliath frog, is 13.5 inches—longer than a ruler! That's a big frog. Frogs that are brightly colored, like poison frogs or the tomato frog, are making an announcement: "I'm toxic—if you eat me,

you'll get very sick!" Predators leave them alone. Other frogs are green and brown to blend into the ponds, rocks, and soil where they live—they hope that predators won't spot them.

Frog or toad?

What's the difference between a frog and a toad? Generally speaking, frogs have smooth, moist skin, long legs for hopping, and suction pads on their toes to help them climb. They're also more likely to live near water. Toads, on the other hand, are more heavyset with shorter legs, and usually have drier skin, often with warty-looking bumps. Don't worry, they aren't really warts, so you can't catch them! But whether they're called frogs or toads, they all belong to the same group of animals, the amphibians. They start out as swimming pollywogs, then go through metamorphosis to become adults.

Jumping Frogs – a static electricity experiment

Have you ever had a static shock from a shopping trolley or an escalator? The shock is because of static electricity which can cause materials to attract or repel each other.

How does static electricity work?

Static electricity is what makes your hair stand on end when you rub a balloon on it. Static electricity occurs when an atom gains or loses an electron.

What is an atom?

All materials are made of atoms.

Atoms contain tiny particles called protons, neutrons, and electrons (subatomic particles). Protons and neutrons are found in the nucleus of an atom. Electrons orbit the nucleus, but occasionally break away.

Balloons and some other objects like a fluffy jumper can steal electrons from other surfaces. The extra electrons give the balloon a negative charge, which attracts other objects, like the tissue paper we use in this activity.

A fun way to demonstrate static electricity is by making jumping frogs.

Materials:

1) Tissue Paper, cut into shapes
2) Wooly sweater or hair

Method:

1) Cut up your different types of paper into frog shapes (or anything else you want to make jump).
2) Blow up your balloon and rub it on your sweater or hair. Hold above the frogs and watch them jump up.

How does this static electricity experiment work?

Rubbing the balloon on your sweater or hair, charges it with static electricity. This attracts the frogs making them jump up to the balloon. They will stick until the charge wears off.

Expand the activity:

1) Does this still work if you use regular paper or cardboard?
2) Can you time how long the frog stays stuck?
3) If you rub the balloon longer does the frog stay stuck longer?
4) Do smaller frogs stick longer that bigger ones?

Frog Life Science: Day One

How do frogs survive being frozen?

The prep for this life science activity is easy. Take 2 plastic containers with lids (empty yogurt containers work perfectly), a glass of water, and a jug of maple syrup.

Fill the container to the line made by the lip. To Make it possible to look at the frozen water and tell if it had changed in volume, make it a point to pour to a defined line.

Take a second container and repeat the process with the maple syrup.

Put the lids on and put the containers in the freezer.

Frog Life Science: Day Two

Before opening them, explain that the **water** represents the cell of an animal. It would show us what would happen to most animals (including people) if they were left unprotected in freezing temperatures.

Now, open the container that has the water and see what has happened. Is there any change to the size?

Explain that as water freezes, ice crystals form and cause the water to expand. The ice crystals damage the cells in most animals' bodies if they freeze and that is why most animals don't survive.

Now, open the container with the syrup and see what has happened. Explain that the **syrup** is a sugar like glucose. Certain hibernating animals, like the wood frog, make a ton of glucose in their liver then send this glucose through their bloodstream to every tissue in their bodies. The glucose-rich cells (like the syrup) don't freeze like normal body cells (like the water) and thus, once thawed, the frog can survive.

Frog Life Cycle
Recycled Craft Transformation

1) Cut a bit of large sized bubble wrap to be our frog eggs.
2) Use a Sharpie to draw the black dot in the middle of the clear eggs.
3) Paint an egg carton section green for the body of the tadpole turned frog.
4) Use pipe cleaners to make the frog's legs. Discuss how many legs a frog has, and which ones emerge first.
5) Cut a tail from craft foam.
6) Use scissors to cut a slit in the back end of the frog for his tail. I
7) Used a hole punch to make holes where the legs will go.
8) First the frog has only a tail as a tadpole. Next, she grows hind legs.
9) Finally, the adult frog has four legs and no tail. She returns to the pond to lay more frog eggs completing the life cycle!

Sticky Tongue Frog Craft with Party Blower

This simple frog tongue craft is unique and then the finished frog's tongue can be used for games and play afterward. Making a preschool craft that turns into a toy is a win-win!

Supplies Needed for Frog Tongue Craft

- green cardstock or construction paper
- felt
- pencil
- scissors
- marker
- party blow outs
- velcro pieces

Make a Sticky Tongue Frog Craft

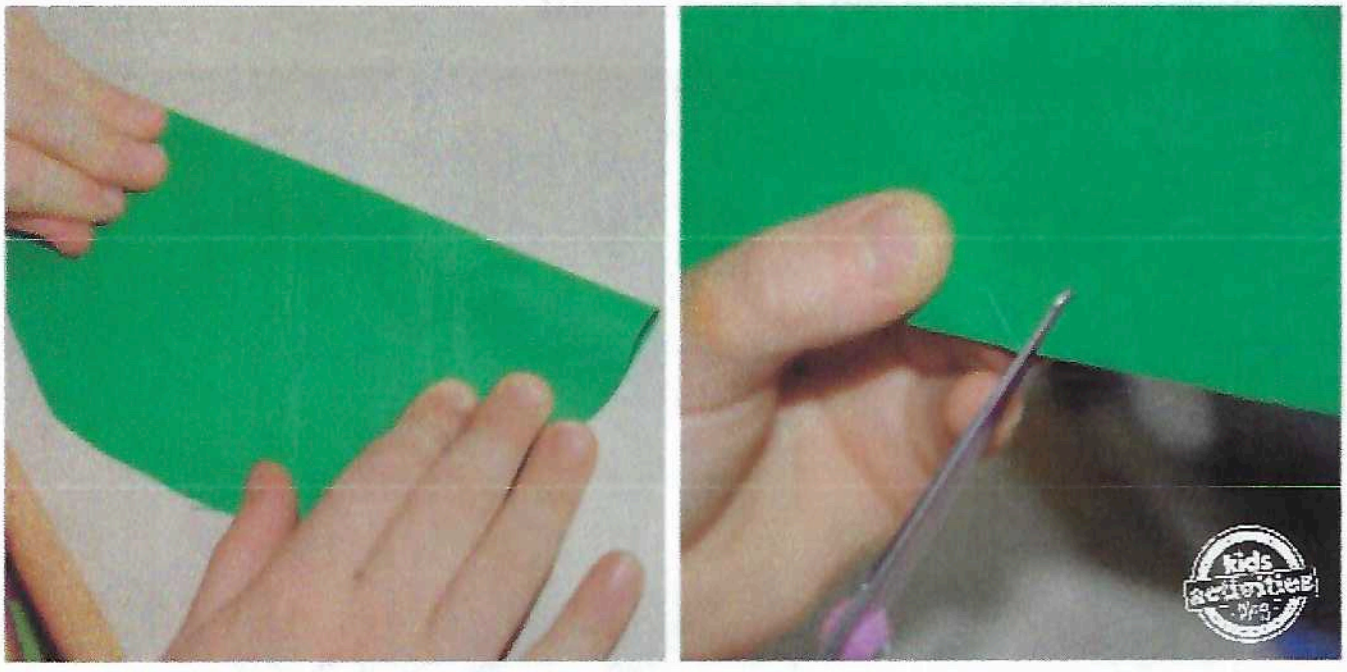
Step 1

To make a frog face to go with the tongue, draw a circle on the green paper. You can freehand this or maybe let your child trace a plate to draw their own circle. Then cut out the circle.

Step 2

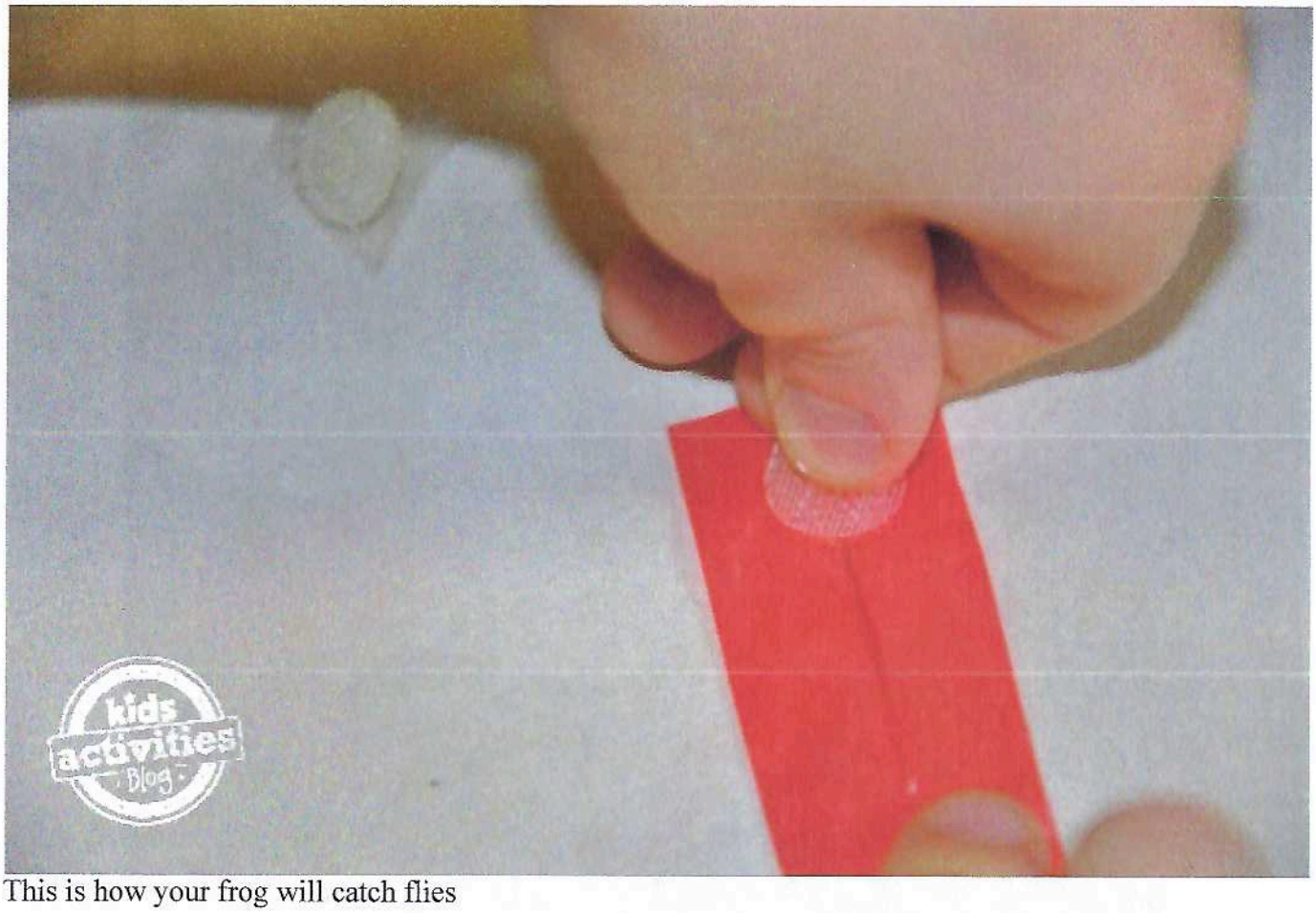
Next, fold the circle in half. Then, on the folded side, cut a "V" notch in the center of the fold.

Step 3



You will need to make a place for the party blower to be inserted

When you open the frog's face, there will now be an "X" in the back of the mouth. Just slide the party blow out into the hole and you have a basic frog and tongue.



This is how your frog will catch flies

Add velcro dots to the back of the party blower tongue.

Step 4

Add some eyes, color the inside of the mouth.

Step 5

Finally, use the black marker to draw some little flies on the piece of felt. Cut them out and place them around on the table. As the child blows out the party favor, the velcro pieces on the end of it will grab the fly and bring it back into the froggie's mouth!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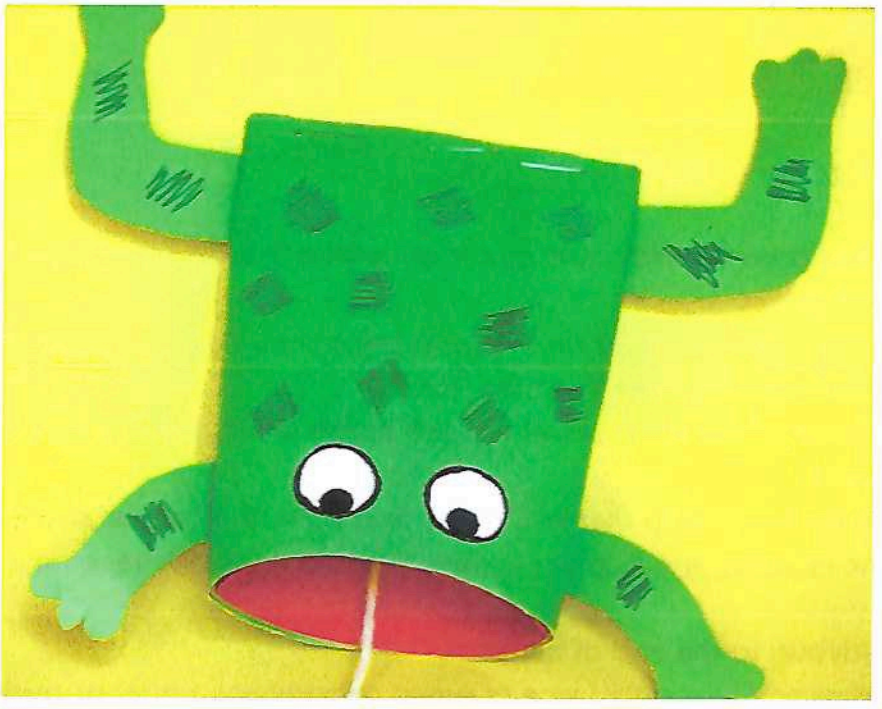
Toilet Paper Roll Frog Craft

kids activity zone

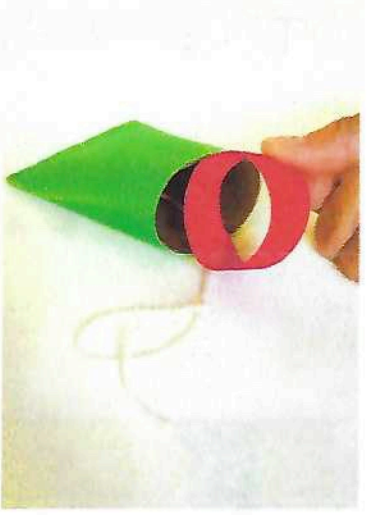


Toilet Paper Roll Frog Craft

Supplies Needed

- Toilet Paper Roll
- Green and Red Construction Paper
- Glue
- Scissors
- Black Marker
- Stapler
- Yarn
- Ladybug and eye template





How to Make Toilet Paper Roll Frog

1. Cut a piece of green construction paper or cardstock to fit around the toilet paper roll and glue it in place.
2. Cut a yarn strip and stick it inside the toilet paper roll. You'll want this long enough to go all the way through the mouth out the front.
3. Flatten the back of the toilet paper roll and staple down, making sure to staple yarn to hold it in place.
4. Next, cut a red paper strip that will be the frog's mouth and glue it inside the roll.
5. Print out the ladybug and frog eye template and cut out. We recommend doing this on cardstock.
6. Glue the ladybug to the end of the yarn.
7. Draw the arms and legs on a piece of green construction paper or cardstock to match frog body, cut them out and glue them to the side of the frog.
8. Decorate the frog with black marker if desired.

Frogs and Lily Pads
SLIME

the kindergarten connection

In nature, lily pads are a floating leaf that comes from a water lily. Frogs typically hide on them to protect themselves from their predators – water snakes and certain fish. Not only does the lily pad provide safety, but it also produces shade which helps cool a pond.

Just be sure to keep vinegar handy for any slime that gets on clothes or hair.

- ½ – 1 tsp of Borax
- 1 cup hot water, ½ cup water
- Big, wide bowl
- Green liquid watercolor or food coloring
- Vinegar (to remove from hair or clothes)
- Gloves

I recommend using two bottles of glue because you want to get a perfect consistency of slime, and the second bottle is a backup. *Make them one at a time though so that you can adapt the second one if necessary.* Getting the perfect consistency the first time doesn't always go so smoothly, so I like having the second bottle to make my slime completely perfect!

Clear or white glue work best for this slime. I only use Elmer's and stick to their popular and common glues. Some of the specialized ones don't work very well either.

Bowl 1 – Water and Borax Mixture

Find a nice sized bowl. You will need to squish the slime in it, so make sure it is big and wide enough.

Mix one cup of hot water in the bowl with ½ tsp of borax. Dissolve completely.

You will want to hold onto this mixture, even after your slime is made! If you find that your slime is too stretchy or turns sticky after a few minutes of playing, you'll be glad you didn't dump this out!

Allow the borax and water to cool as you prep you the next step.

Bowl 2 – Glue and Water Mixture

Mix one container of Elmer's glue (5-6 oz) with *½ cup* of water. You won't want to skip this step. The glue needs to be watered down and separated to prevent a slime fail. I find that a container with a pour spout is perfect for this.

Use a whisk to stir them together. You want it to be completely mixed, so this may take a few minutes.

Add several drops of green liquid watercolor or food coloring.

Now, it's time to pour your glue mixture into the big bowl with the borax and water mixture.

Watch for a minute as the glue mixture starts to polymerize! It's such a cool sight to see.

Then, start squishing the slime to help it absorb as much of the borax and water mixture as possible. Feel free to wear gloves or to stir with a spoon if you would prefer. I recommend that the adult does this part.

The slime will feel quite sticky or chunky for a minute or two but keep squishing, kneading, stirring, or mixing. Do this for two to three minutes.

Once it isn't feeling sticky or chunky, pull it out and knead it some more.

Take a small piece of slime and set in on a surface. You'll see it spread into a circle after a minute or two, and it has magically transformed from just green slime to a lily pad. It's all ready for the frogs to come start playing on it.

Make a Fun Handprint and Footprint Tissue Paper Frog

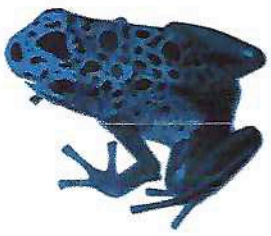
Materials Needed

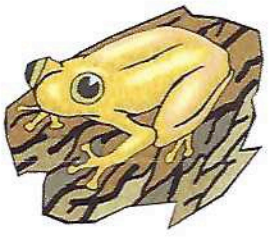
- Paper plate
- Cut up green tissue paper
- Scissors
- Glue
- Bowl
- Googly eyes
- Green, white, and red construction paper
- Pen
- Scissors
- Tape

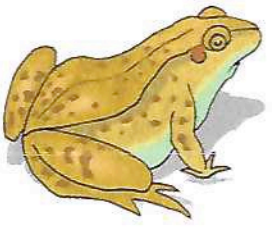
Instructions

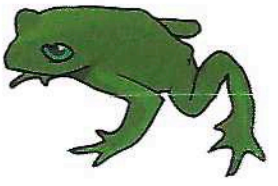
- Gather all materials prior to starting, cut up squares of tissues paper and have ready to use.
- Squeeze glue into the bowl.
- Call your child to the table and get started.

- Have them crumple the paper into small pieces, dip it into the glue, and apply to the paper plate.
- Repeat this step until the whole paper plate is covered.
- Trace both of your child's hands on green construction paper and cut them out (depending on your child's age they could cut them out themselves).
- Trace one of your child's feet on red construction paper and cut it out.
- Cut two large circles out of the remaining green construction paper.
- Cut two small circles out of white construction paper.
- Glue the small white circles towards the bottom of the large green circles.
- Then attach the googly eyes on the white circles.
- Attach the green circles to the back of the paper plate with tape.
- Attach the handprints as feet on the bottom of the paper plate with tape.
- Attach the red footprint to the front of the paper plate (near the bottom) with glue – accordion the narrow end of the foot to help it stick out straight.
- Display!









Rocks Are Everywhere Workshop Activities
By Heather Cedrone

Salamander Rock Activities: STREAM

1) Science: Sink and Float using natural materials
    a) Collect 10 natural items found at Salamander Rock.
    b) Try out sink and float in the duck pond.
    c) Do more of your items sink or float?
2) Technology: Self Portraits using natural materials
    a) Look around and collect some natural materials that would be good to use to make your self portrait.
    b) Items needed: 4 tree cookies, mirror
3) Reading: Story Stones (ask John)
4) Books in our Library:
    a) The Magic School Bus Inside the Earth
    b) Scribble Stones
    c) A Rock Can Be
    d) Rocks: Hard, Soft, Smooth, and Rough
5) Engineering: Natural Materials to build structure
    a) Items needed: natural Materials (rocks, sticks, etc.) twine and soil/water, mud
    b) Hammers to hammer sticks into the ground – tell a story with the sticks and count how many a student hammers into the ground
6) Art: Cut Natural Materials to create a work of art
    a) Materials needed: Glue and Cardboard
    b) And/or sticky paper (contact paper)
7) Math: Sort/ Classify rocks
    a) Items needed: rocks
    b) Questions: How did you sort the rocks?

Taking students outdoors to view rocks in their natural surroundings is an ideal way to introduce the idea that rocks of various shapes and sizes are part of our earth and can be found everywhere in the world.

Hands on investigation of Rocks:

Gather
Observe
Sort
Record

We ask the students to describe the rock in words (big, small, bumpy, smooth, dark, light, heavy, round, flat, etc.

Older students could learn about the three different types of rocks: sedimentary, igneous, and metamorphic.

Some concepts preschool students can learn about rocks:

- The names of different sized rocks (pebbles, rocks, boulders, etc.)

- Properties of different kinds of rocks (focus on textures, size, and colors, etc.)
- Whether rocks sink or float
- Which types of rocks will make markings on concrete
- Where rocks can be found on earth
- How different rocks are formed
- Different objects that are made of stone
- Different structures around the world that are made of stone

Include STEM, STEAM, or STREAM

Science
Technology
Reading
Engineering
Art
Math

Science:

1) Weigh, measure, and illustrate the rocks.
2) Try sink/float activities with various rocks and pebbles.
3) Try a scratch test using a coin (penny).
4) Use lots of vocabulary words with the students. Ask what they notice about the rock. Is it shiny or dull?
5) Use a magnet to determine if the rock is magnetic.
6) Make a rock:
    a) Plastic cups (small or large)
    b) Glue
    c) Sand
    d) Pebbles

    In a plastic cup layer sand, glue, and pebbles and repeat 2 to 3 times. Let dry and cut the cup to remove the rock. Study the layers with a magnifying glass.
7) Sort rocks by characteristics:
    a) Color
    b) Streak
    c) Hardness
    d) Cleavage.
    e) Fracture.
    f) Luster.

8) Sort by different categories:
    a) sedimentary
    b) igneous
    c) metamorphic
    d) Small/large
    e) Dark/light
    f) Rough Smooth

Technology:

1) Take photos of rocks
2) Use the internet to answer questions about nature:
    a. Project Learning Tree https://www.plt.org is an environmental education program designed for educators. The curriculum and activities are aligned with state standards and are practical for early childhood through grade 12.
    b. The Nature Find https://www.naturefind.com website is great for finding events and places involving nature exploration
3) Nature Apps
    a) Leafsnap: a field guide that uses visual recognition to help identify tree species from photographs of their leaves
    b) Peaks: allows you to take a photo of mountains and then identify the name, location, and altitude of the peaks you've captured
    c) Audubon Birds: a field guide that includes photos, descriptions, calls, and sightings of various birds
    d) My Nature Animals Tracks: includes a database of track and scat
    e) All Trails: lists any nearby trails
    f) Nature Passport: This contains missions that encourage children to learn, play, and explore in the natural spaces where they live.

EXPLORING SOUND MAPPING

This project will get your kids to listen - maybe not to you, but to the world around them

Sound waves are everywhere, giving us information about the world around us. But our brains do a fantastic job of ignoring mundane sounds, often times not giving us a full picture of our surroundings. Which is why your child may not always hear you when you ask them to clean their room.

This simple activity will help your child concentrate on sounds that shape their environment. By closing their eyes, they may hear birds they never heard before, the faint sound of a freeway nearby, or even your voice asking them to pick up their socks. Yay, science!

GATHER THIS:

- Piece of paper (one for each participant)
- Pencil or pen
- Compass (optional)

THEN DO THIS:

1. Go somewhere you'd like to better understand by listening – in your house, backyard, a park – anywhere!
2. When you've found your spot, put a mark in the center of your paper. Your mark can be an "X," a dot, or even a drawing of yourself. This mark represents you. The blank space around your mark represents your surroundings.
3. If you'd like, use a compass to mark North, East, South and West on your map.
4. Close your eyes and listen for any sounds.
5. When you hear a sound, notice the direction the sound is coming from. Is the sound moving or is it still?
6. Mark the sound on your paper in the direction you heard it. If the sound came from your right, put a mark on the right side of your paper. Draw or write what sounds you heard to help you remember later.
7. Continue listening and filling your paper with all the sounds you heard.
8. Review your map. If doing this experiment with friends, it's always fun to share your data.

ASK THIS:

- Are there more human or nature sounds? Why do you think that is?
- What new sounds did you hear?
- How might certain sound effect behaviors in people or animals?
- What sounds surprised you?

WHAT IS HAPPENING?

We hear sound through waves which enter our ears. These vibrations turn into signals which your brain interprets into the sounds we hear every day. Luckily, our brains can filter out unimportant sounds. If we stop, close our eyes and listen, a whole new world will be revealed to us. One can pick up the subtleties of their environment and learn about the areas they live, work, and play in just by listening.

CuriOdyssey
SCIENCE PLAYGROUND & ZOO

WHAT THIS TEACHES:

Skills: Observation, Patience
Themes: Sound and Environments

HOW TO MAKE ART WITH BUBBLES

This playful project definitely doesn't blow

Blowing bubbles is every kid's favorite outdoor activity. But what if you're stuck inside and can't bear the idea of those sticky orbs landing all over the furniture? Here's a project that lets your little one blow some bubbles – and make a cool piece of art at the same time.

Using a simple mixture of dish soap, tempera paint and water, your child creates beautiful colored bubbles that they can then "save" by transferring to a piece of paper. This fun project will keep them from blowing those bubbles in the house – for the time being.

GATHER THIS:

- Tempera paint in various colors
- Dawn dish soap
- Bowls (soup bowls are the perfect size)
- White Paper
- Straws
- Water
- Tablecloth (Cover your table. This can get messy!)

THEN DO THIS:

1. In each bowl, combine two tablespoons of paint, two tablespoons of dish soap and 1/4 cup of water. Stir well.
2. Place a straw in the soap mixture and blow until bubbles rise up past the rim of the bowl. (Note: For very young children, parents may want to do this step to avoid them drinking the liquid through the straw!)
3. Gently place your paper on the top of the bubbles to capture the soapy design
4. You can then place the same piece of paper on another bowl with different colored bubbles to create a colorful pattern.

   *Alternately, you can use a spoon to scoop up the bubbles and place them on a sheet of paper. After the bubbles pop, they'll create a unique pattern!

ASK THIS:

- Do different sized bubbles make different designs?
- What happens to the bubbles as they pop?

WHAT IS HAPPENING?

When you place the paper on top of the bubbles, the rough surface of the paper pops them. Then, the soap and the paint that make up the bubble is deposited on to the paper to make your design.

WHAT THIS TEACHES:

Skills: Fine motor skills, observation, scientific method
Themes: Surface tension, reflection & refraction of light waves, elasticity, light, geometry

CuriOdyssey
SCIENCE PLAYGROUND & ZOO

makered.org/blog/learning-in-the-making-natural-paints

MAKER ED PRESENTS

LEARNING IN THE MAKING

HOW TO MAKE NATURAL PAINTS

INTRODUCTION

The natural world is filled with vibrant color! Our very own environments hold many valuable tools for creation. Would you believe me if I told you that in today's project you are going to make your very own paint pigments? Today's project saves money and the environment! In this project, you will learn how to make paint from food items that could be found in a refrigerator or pantry.

Creating your natural paints is just the beginning. Once you have your colorful paints ready to use, you will use these paints to create patterned paper. Patterned paper can be used for collages, cards, and more!

In this project you will explore your identity as an artist and as a scientist. Did you know that scientists and artists are actually a lot more similar than they are different?

an you think of some ways that scientists and artist are alike?

IN THIS ACTIVITY YOU WILL:

- Extract pigments from natural objects around you.
- Manipulate the form of natural objects.
- Create patterned paper to be used in new ways like cards, collages, wrapping paper, and more!

Tools & Materials of Making

Get creative and use whatever materials you have available.

Here are some suggestions to start with:

- **Cooking Materials:** Small Pot + stove, Microwave (if no stove), Small bowls/cups, Spoon
- **Food Materials:** Red cabbage, Spinach, Berries (fresh or frozen), Tea (black or herbal), Coffee, Vinegar, Baking soda
- **Texture Materials:** Paint brushes, Sponges, Q-tips, Leaves, any other interesting textured objects
- **Paper:** White paper of varying thicknesses (watercolor paper if you have it)
- **Tools:** Scissors, Pens, Pencils, Markers, Paper

Subject

Chemistry
Art

Standards

NGSS-PS1.B:
Chemical Reactions

NGSS-MS-ETS1-4:
Engineering Design

Grades

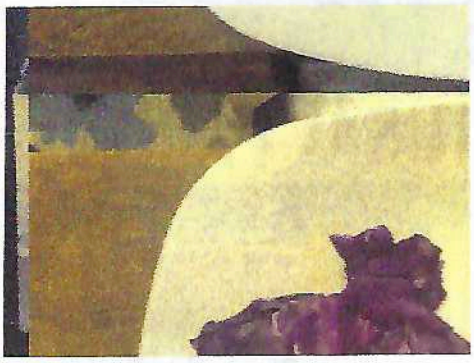
K-2nd
3-5th
6-8th
9-12th

Key Terms

Boil
Extraction
Concentrated
Diluted
Pigment
Manipulate
Synthetic
Acid
Base

Watch the video here:
https://bit.ly/NaturalPaints

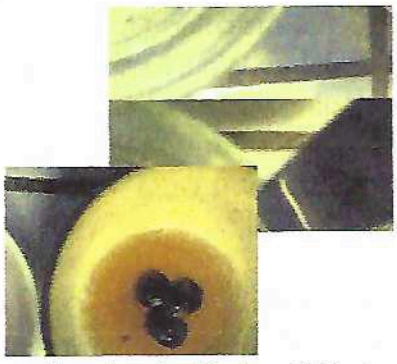
ACTIVITY INSTRUCTIONS



MAKING NATURAL PAINT PIGMENTS

Some food materials are easier to *extract*, or take, color from. Foods like coffee, tea, spinach, and berries are easy foods to extract color form.
HINT: Food materials can be scraps and leftovers. Instead of throwing them away, use them for paint!

1. Gather 2-3 food materials (from list).



2. Safely and carefully, chop up your foods. You can also rip them into pieces or smash them up.

3. Safely and carefully, heat up your water. Get some hot water near boiling. You can do this on the stove, in an electric kettle, or in the microwave. (Make sure you have adult supervision).

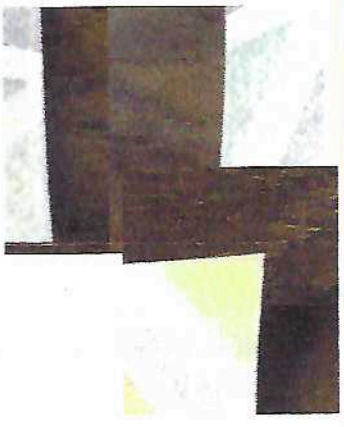
4. Put your food materials it in your bowl and add about ¼ hot cup of water (the ratio of raw material:water is 1:2)
Once you have it all in the bowl, grab a spoon or something to use to break the material into smaller and smaller pieces for about 30 seconds.

5. Test pigment by dipping a strip of paper into the pot
Finally, strain your pigment by separating the water from the tiny pieces of food scraps using a spoon or strainer.
And let it cool down.
What does it look like and smell like before and after?

MAKING PATTERNED PAPER

Now use your pigments!

1. Find a couple different objects to use for painting (sponge, paint brush, plastic bag, q-tip, leaves, flowers)
2. On a white piece of paper, make patterns with your pigments. Try repeating patterns, random markings, etc, and fill up the whole page.
3. Let dry.
4. To make your designs darker, add more layers of pigment. Let each layer dry before adding the new one.
5. Finally, cut up your patterned paper to make collages, cards, paper weaving, etc... Get creative!

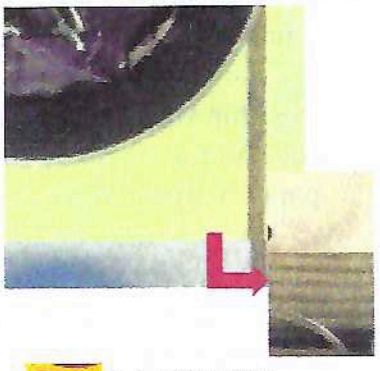


REFLECT

- Who are you grateful for?
- Can you create a pattern that reflects that person or what you are grateful to them for?

Example: I am grateful for my grandmother because she taught me how to garden. I will make my pattern a design of plants and garden tools.

Helpful Tip:
Pigments are often extracted by increasing the surface area. We do that by breaking thing up into lots of pieces. The more edges we have, the more surface area we have. Then we add some hot water to break open the cells even more. Once it cools, you can strain it if you want. You can use a strainer, or use a fork or spoon.



Extra Credit!
Turn red cabbage to two different col...
1. Boil cabbage in 2 cups of water
2. Separate pigment into two different cups.
3. Add an acid like lemon juice or vinegar to cup #1
4. Add a base like baking soda into cup #2.

What color does a base turn your red cabbage pigment? What color does an acid turn your red cabbage pigment?

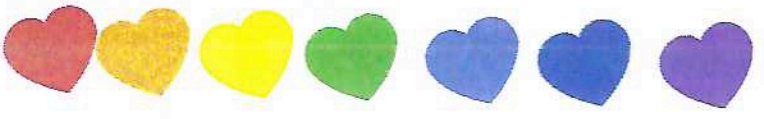
Created in collaboration with:
Aáron Heard & Annalise n
For more resources, visit us:
makered.org

Share your project! @MakerEdOrg #MakerEdAtHome #NaturalPaints

Dr. Diane Jackson Schnoor LLC
www.drdianeadventures.com
diane@drdianeadventures.com

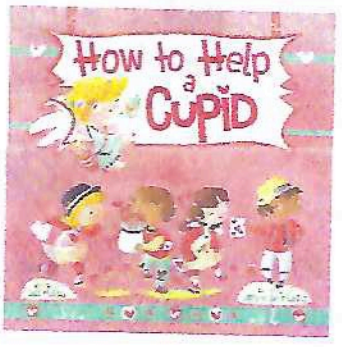
Resources for Steve Spangler Workshop
Valentines Fun

How do we connect multicultural picture books with STEM to help children engage in active discovery and enthusiastic learning across the curriculum? Steve's workshop gives you the fun themed STEM activities your kids will love. This PDF helps provide ideas for picture books you can pair with the different themes.



Books That Connect to Valentine's Day (and Beyond)

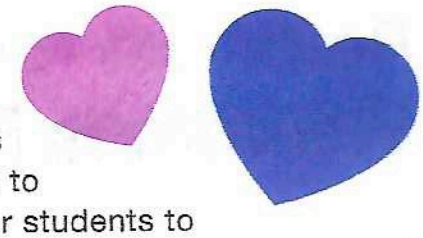
Let's start with SLIME — **Valenslime** (Joy Keller/Ashley Belote). It's the sequel to **Frankenslime** (Joy Keller/Ashley Belote), and tells the Valentine's Day tale of a slime experiment that gets out of control when Victoria Franken tries to make a friend for her slime creature, Goop. It includes a **Frankenslime activity guide**.



You might also enjoy **How to Help a Cupid** (Sue Fliess/ Simona Sanfilippo), which includes ideas for making and sharing Valentines, as well as background information on the holiday itself. This could pair really well with Steve's secret message experiences for a memorable Valentine's Day. Other good books for inspiring cards include **My Heart Is Like a Zoo** (Michael Hall), **The I Love You Book** (Todd Parr), **Henry In Love** (Peter McCarty), and **LOVE from The Very Hungry Caterpillar** (Eric Carle).

Dr. Diane Jackson Schnoor LLC
www.drdianeadventures.com
diane@drdianeadventures.com

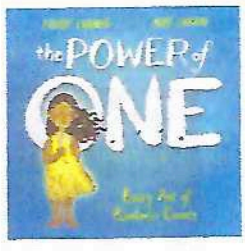
Valentine's Day as An Opportunity for Building Connected Experiences



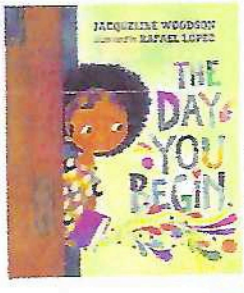
Another approach I like to take with Valentine's Day is to use it as an opportunity for community service and to develop empathy and kindness. It's a great chance for students to sharpen critical thinking skills, to look around their own environment, and to ask what can I do to make things better? You can build connected experiences where they research and collect data, communicate with experts, and design solutions. You can even add in math with budgeting, engineering and design (depending on the problem and solutions they are working with), and literacy (written and oral communication, as well as research). Some books for inspiring connected experiences and love include:

Love (Matt de la Pena/Loren Long), **A Family Is a Family Is a Family** (Sara O'Leary/Qin Long), and **Drawn Together** (Minh Le/ Dan Santat) explore the intergenerational love and connection of families.

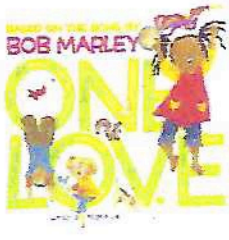
The Power of One (Trudy Ludwig/Mike Curato), **I Am Today** (Matt Forrest Esenwine/Patricia Pessoa), **Thank You, Omu!** (One Mora), and **Maybe Something Beautiful** (F. Isabel Campoy/ Theresa Howell/Rafael Lopez) demonstrate the power of small acts of kindness to add up to something big.



The Day You Begin (Jacqueline Woodson/Rafael Lopez), and **The Little Book of Joy** (Dalai Lama, Desmond Tutu, Rafael López) show the power of connections.



If You'll Be My Valentine (Cynthia Rylant/Fumi Kosaka), **One Love** (Cedella Marley/Vanessa Brantley-Newton), **Tiny T. Rex and the Perfect Valentine** (Jonathan Stutzman/Jay Fleck), and **How Do Dinosaurs Say I Love You?** (Jane Yolen/Mark Teague) are joyful additions to your Valentine read aloud and connect well to Steve's activities.



Pumpkin Activities

A carved pumpkin makes a great bird feeder! These step-by-step instructions will show you how to build your very own pumpkin bird feeder.

Materials

- One leftover pumpkin
- Wooden barbeque skewers
- Garden twine
- Birdseed

Instructions

1. Cut a pumpkin into the shape of a shallow bowl.
2. Stick three or four barbeque skewers through the pumpkin shell. The skewers should go through as much pumpkin flesh as possible so they don't wiggle. Leave one or two inches of one end of each skewer sticking out of the pumpkin.
3. Tie a piece of twine to each one of the skewers. Take the opposite ends of the twine and tie them together to make a hanger.
4. Hang the pumpkin birdfeeder outside. Put one or two handfuls of birdseed inside the bowl.
5. Watch the feeder to see who comes to visit!
6. When the bowl is empty, or after three or four days have passed, toss what's left of your birdfeeder into the compost.

Pumpkins can be pretty heavy. Do you think pumpkins float or sink in water?

Try it and find out!

Materials

- Several pumpkins of different sizes
- One jack o' lantern or carved pumpkin
- Bathtub
- Towels to keep the floor dry

Instructions

1. Fill your bathtub with water.

2. Gather a few pumpkins of various sizes and weights. For each pumpkin, make a prediction—will it float or sink?

3. Gently place the pumpkins in the water and see what happens.
    - *Was your prediction correct?*
    - *Why do you think the pumpkins floated or sank?*
4. Now try the experiment again with a jack o' lantern or carved pumpkin. Make your prediction—will it float or sink?
    - *Was your prediction correct?*
    - *Is this the same or different from what the whole pumpkins did? Why or why not?*

Mass Audubon

Build Your Own Pumpkin Bird Feeder

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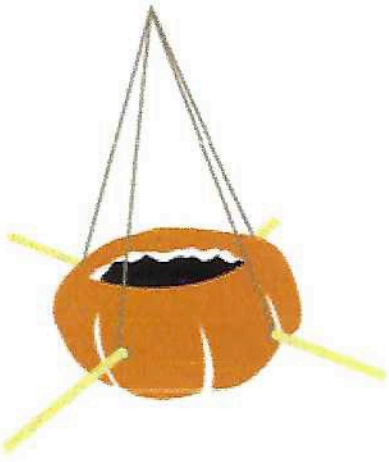

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Owl Fine Motor Cover-Up

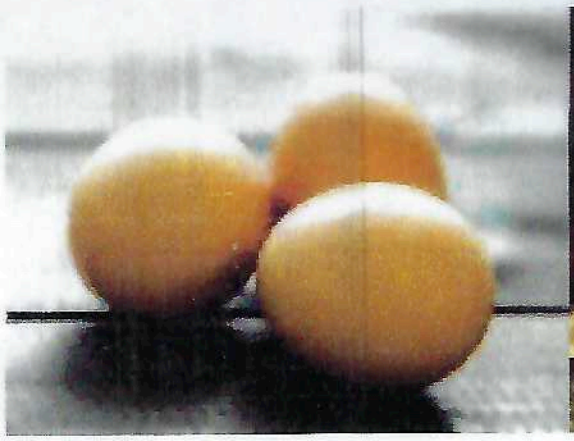
Instructions: Print on cardstock paper and laminate. Children can use a variety of objects to cover up the blank circles on the owl. Use supervision with small objects.

buttons
playdough
magnets
pom poms
bingo daubers or do-a-dot markers
stickers
flat glass beads

You can also have the children roll a dice and do a count and cover activity.


childcareland.com

EGGS COLLECTED



DAY OF THE WEEK	NUMBER OF EGGS COLLECTED	NAME(s) OF COLLECTORS
MONDAY		
TUESDAY		
WEDNESDAY		
THURSDAY		
FRIDAY		

BARN SWEEPING

DAY OF THE WEEK	BARN SWEPT YES or NO?
MONDAY	
TUESDAY	
WEDNESDAY	
THURSDAY	
FRIDAY	