



EASTERN WASHINGTON UNIVERSITY
INVITES YOU TO JOIN US FOR

SPOOKY SCIENCE

*Celebrate Halloween with EWU Scientists!
Enjoy frighteningly fun experiments, and activities
celebrating the season with science from home.*





A Spooktastic Day of Science

Fun activities await you!

pH Testing Potion

A Witches' Guide to Phases of the Moon

Haunted Dry Erase Animation

Ghastly Glowing Geology

Spooktacular Scavenger Hunt

Instructions for all video activities as well as additional resources are included in this packet.

Videos available at:

<https://www.youtube.com/watch?v=efh62rFsvBY>





pH Testing Potion

What You'll Need:

- Red/Purple cabbage
- Boiling water
- Large glass or metal bowl
- Colander
- Plastic cups
- Household items to test (like baking soda, vinegar, coffee, eggs, soap, etc)

What You'll Do:

- Chop purple cabbage into small pieces until you have about 2 cups. Place the cabbage in a large bowl or other glass (or metal) container and add boiling water to cover the cabbage. Allow at least 10 minutes for the color to leach out of the cabbage. Alternatively, you can place about 2 cups of cabbage in a blender, cover it with boiling water, and blend it.
- Filter out the plant material to obtain a red-purple-bluish colored liquid. This liquid is at about pH 7. The exact color you get depends on the pH of the water.
- Pour a small amount of your cabbage indicator into cups (jars, bowls or even paper plates work).
- Add various household solutions to your indicator until it changes color. Use separate containers for each household solution—you don't want to mix chemicals that don't go well together.
- Compare each solution to the included pH indicator chart to determine the pH



pH Testing Potion

What You'll Learn:

pH is a way to determine how acidic or basic compounds are. The pH scale ranges from 0-14. 0-6 are considered acidic 7 (water) is neutral and 8-14 are basic.

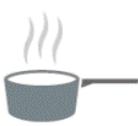
Red cabbage contains a pigment molecule called flavin (an anthocyanin). This water-soluble pigment is also found in apple skins, plums, poppies, cornflowers, and grapes.

Very acidic solutions will turn anthocyanin into a red color. Neutral compounds result in a purplish color. Basic or alkaline compounds appear in greenish-yellow. Therefore, you can determine the pH of a solution based on the color that it turns the anthocyanin pigments in red cabbage juice.

MAKING AN INDICATOR FROM RED CABBAGE

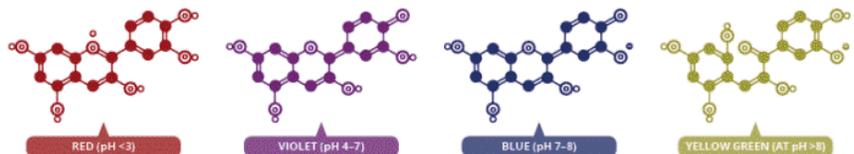
The compounds that give red cabbage its colour can be extracted and used as a pH indicator solution. Here we look at the method and the colours!

MAKING THE INDICATOR

- **1**
ROUGHLY CHOP THE CABBAGE
- **2**
BOIL FOR A FEW MINUTES
- **3**
STRAIN AND LET COOL
- **4**
USE AS AN INDICATOR!



← ACIDIC pH ALKALINE →



Hydrogens on carbon atoms implied; each carbon has 4 bonds.

The red cabbage extract can be used to determine whether substances are acidic or alkaline. The structures of the anthocyanin pigments which give the red cabbage its colour are subtly changed at varying pH. These different structures give a range of colours.



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A Witches' Guide to Phases of the Moon

What You'll Need:

- 2 clear plastic cups
- 1 black sharpie/permanent marker
- 1 sheet of black construction paper
- 1 sheet yellow construction paper
- Tape/glue, scissors, ruler
- Stickers or metallic markers to decorate (optional)

What You'll Do:

Part 1:

1. Take your black construction paper and cut it to be slightly shorter than a plastic cup. This will be your night sky!
2. Cut out about an inch diameter circle from your yellow construction paper and glue/tape it onto your black paper, about midway up. This is now your moon!
3. Use stickers like gold stars, or metallic markers to decorate your night sky with whatever stars or planets you might want!
4. Roll up your finished night sky and put it in your first plastic cup.

Part 2:

1. Insert the first plastic cup (with your sky) into the second one.
2. Using the yellow moon as a template, draw 8 circles around the cup, as evenly spaced as possible.
3. Following the below pattern, use a black sharpie to color in the black areas over the circles:





A Witches' Guide to Phases of the Moon

What You'll Do:

Part 3:

1. Use the yellow construction paper to make a small arrow and glue it onto the outer cup above one of the moons.
2. Make labels for the different moon stages and glue them underneath your moons.
3. Turn the outer cup and watch the moon move through its cycle!

What You'll Learn:

As every witch, wizard, or werewolf knows, the phases of the moon are very important to know! The moon is super important for everything from the ocean's tides, to witchy spells, and scientists studying astronomy. Here's an easy tool you can build with your little mad scientist to help them learn about the different phases!

Resources: this activity was originally seen on Happy Tot Shelf, a blog for educational activities for children

<https://happytotshelf.com/moon-phases-learning-toy/>





It's Alive! Dry Erase Animation

What You'll Need:

- At least 1 dry-erase marker of any color
- A clean glass surface (bowls and plates work great)

Water, room temperature works fine

What You'll Do:

- Draw an image on the clean, dry glass surface with a dry erase marker. Make sure that all the lines connect. Tracing back over the lines helps to ensure that all the lines are fully connected. Wait for the dry erase marker to fully dry.
- Add water slowly to one edge of the glass surface away from the drawing.
- Slowly tip the water toward the drawing and watch the drawing lift from the surface and start to float on top of the water.
- Once the drawing is afloat, you can swirl the water to make the image move around and become “animated”. (If you touch the drawing, the pigment will cling on to object you are using to move the water)
- Repeat as many times as you would like!

What You'll Learn:

The ink in dry erase markers is created to be minimally adhesive so that drawings can easily be wiped away, unlike the ink used in many other types of markers. The ink is also insoluble, so water is unable to dissolve the ink. This also means that the ink is less dense than water and will float, similar to an ice cube! The buoyancy force is stronger than the adhesive force in the ink and pulls the drawing to the surface of the water where it comes alive with animation!





Spooktacular Scavenger Hunt

Throw on your coat, grab your scarf and gloves and join us for a Spooktacular Scavenger Hunt!

Page one of this activity lists the sixteen items that you are on the hunt for. Page two lists some interesting facts and shares additional resources about these items.

Consider starting a nature jar by collecting some items, as you go. Enjoy observing and inspecting your treasures long past your walk. Make it your mission to find new specimens to add to the collection and enjoy time researching these as you go!

It may also be fun to bring along a pen and paper to make notes, draw a picture or journal about everything you are seeing, hearing, touching or smelling.

There is no video attached to this activity. Have fun outside discovering and observing like the scientist you are!



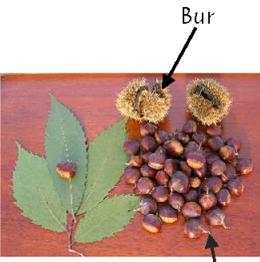


Spooktacular Scavenger Hunt

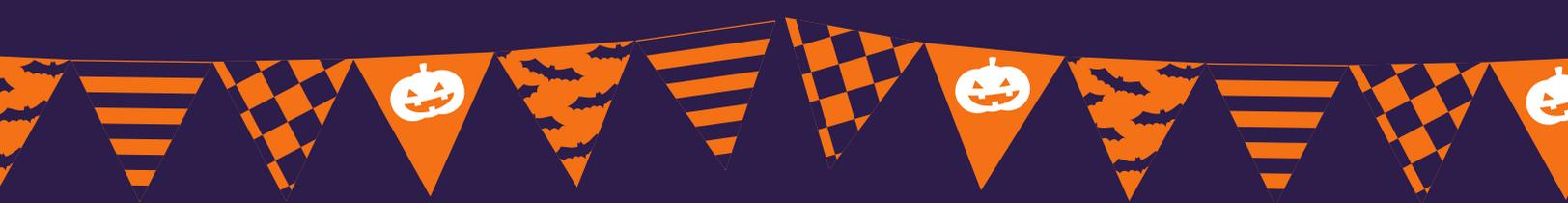
Acorn	Fake Spider Web	Insect	Lichen
Spider	Mushroom	An Unusual Rock	An Inflated Halloween Decoration
Pine Cones	Pumpkin	Berries	A Bird Feather
Halloween Lights	Colorful Leaves	Chestnut Or Chestnut Bur	Frost, Ice or Something Frozen



Spooktacular Scavenger Hunt

<p>Acorns are the fruit of an Oak Tree.</p> <p>A single tree can produce upwards of 2,200 acorns a season, but each acorn only has a 1 in 10,000 chance of becoming an oak tree.</p>		<p>Insects outnumber all other land-dwelling animals combined!</p> <p>If we count every kind of land animal known thus far, that total is still only about a third of the known insect species.</p>	<p>Lichens are made up of two living organisms, fungus and algae.</p> <p>The algae produces food, and the fungus gathers water allowing them to survive in harsh environments.</p>
<p>Spiders are found on every continent of the world except Antarctica.</p> <p>There are around 40,000 different known species of spider.</p> <p>Most spiders make silk which they use to create spider webs and capture prey.</p>	<p>A mushroom is neither a fruit nor a vegetable; technically mushrooms aren't even plants. Mushrooms are a type of fungi; Fungi are living organisms that are distantly related to plants, and more closely related to animals, but rather different from either of those groups.</p>	<p>Interested in identifying that cool rock you found? Check out this fun resource:</p> <p>https://www.thoughtco.com/rock-identification-tables-1441174</p>	
<p>Pine cones can stay on a tree for up to ten years.</p> <p>Even on the ground, cones can keep their scales closed for months and even years.</p>	<p>Pumpkins are a fruit, more specifically, a berry!</p> <p>Watermelons, Bananas and Avocados are also technically berries.</p>	<p>Not all birds head south for the winter. Those that stay often rely on shrubs that produce berries in the Fall and Winter months. If you are interested in increasing your bird watching longevity, consider planting a snowberry bush or two.</p>	<p>Feathers have different purposes. Straight, stiff feathers give birds their ability to fly. Tail feathers help with steering, balance, and braking. Small, fluffy feathers, called down, keep a bird's body from getting too cold and its skin from getting wet.</p>
	<p>Here is a great to explain why leaves turn color!</p> <p>https://sciencesimplexplained.com/why-do-leaves-change-color-in-fall/</p>		<p>When temperatures drop, clear, calm evening skies are good predictor of a frosty Fall morning. Cloudy skies keep heat in warming the ground. On windy nights colder air is pushed along without a chance to settle on the ground, decreasing the chance for morning frost.</p>





**We Hope You
Enjoyed
Spooky Science!**

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