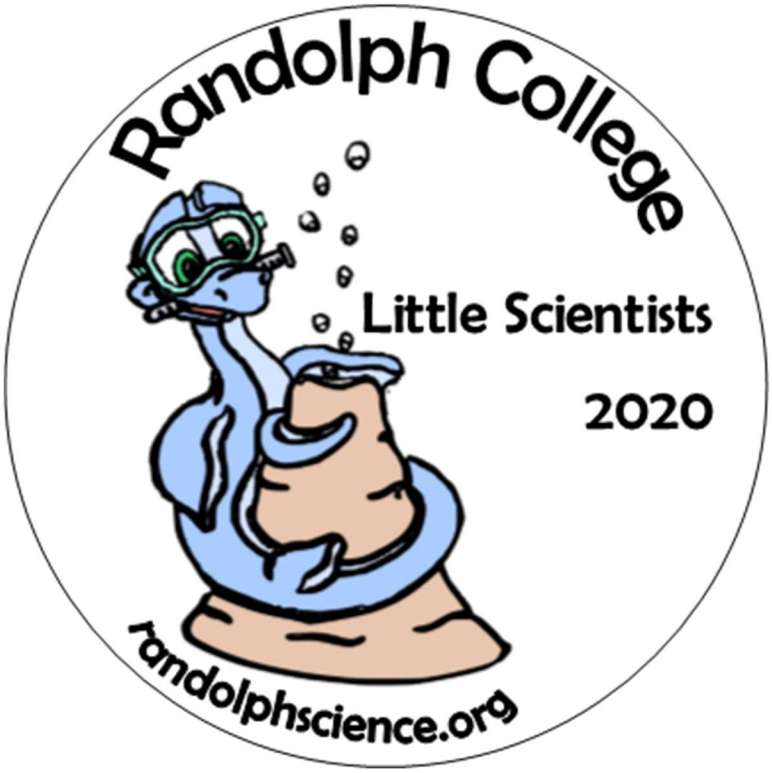


Activity Booklet

Contents:

A Little about our Science Dino of 2020…

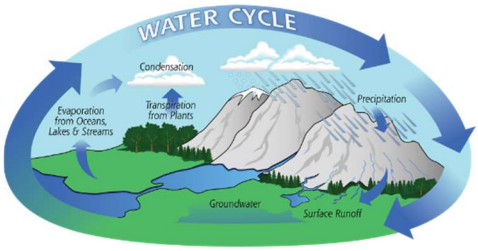
Our prehistoric lab assistant this year is Pearl the Plesiosaur. Plesiosaurs lived in the ocean when dinosaurs roamed the Earth. Pearl's favorite pastimes include studying chemistry and experimenting with the volcanic vents in the ocean!

More information about Plesiosaurs:

- https://kids.britannica.com/kids/article/plesiosaur/390390
- https://www.newdinosaurs.com/plesiosaurus/
- https://dinosaurpictures.org/Plesiosaurus-pictures

Cloud in a Jar

(Chemistry and Physics)



Description:

This activity explores the creation of clouds. In nature, water *evaporates* under the heat of the sun. It then climbs high in the sky where it is much cooler. In the sky, there are *aerosols* (think of tiny solid particles held by a gas, like hair spray) that water will collect to and eventually, if heavy enough, fall as rain. Let's recreate this with some household items!

Materials:

- Glass Jar with Lid
- Hot Water (not much)
- Ice Cubes
- Hair Spray

Directions:

1) Heat some water and pour a small amount into the glass jar. Be sure to swirl it around to make the inside of the jar warm.
2) Spray a little bit of hair spray inside the jar and quickly rest the lid upside down on top of the jar.
3) Place some ice cubes on top of the lid and watch the water molecules gather, or *condense*, around the hair spray inside the jar.
4) When you think it is ready, lift off the lid and watch your cloud escape!

Additional Resources:

- https://pmm.nasa.gov/education/water-cycle
- https://littlebinsforlittlehands.com/cloud-in-a-jar/

Density Globes

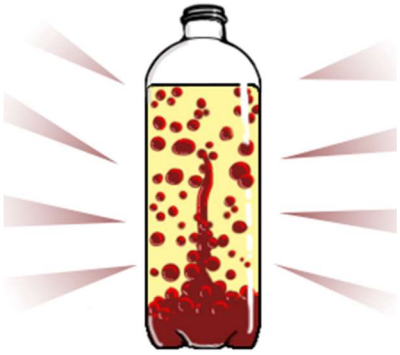
(Physics)

Description:

Is it possible for liquids to stay separate? If they do separate, why? This activity lets children explore the effects of *density* - how compact a material is - as they create their own density globes. As you perform this activity, think of which materials may be more dense than others. The denser the material, the more it will sink when mixed with the other materials.

Materials:

- Vegetable Oil
- Water
- Alka-Seltzer Tablets
- Optional: Glitter, Beads, or some other small item like tiny plastic fish
- Food Coloring
- Jar of Some Kind



Directions:

1) Fill jar half full with water.
2) Mix 2-3 drops of food coloring in the jar.
3) Fill a quarter of the jar with vegetable oil.
4) Mix the water and oil and let separate.
5) Optional: You can add glitter, beads, or some other small items and see what happens.
6) Add Alka-Seltzer. You can start with half a tablet and add more as you wish.
7) Seal the jar and enjoy!

Additional Resources:

- https://nubipro.blogspot.com/2016/05/how-to-make-easy-lava-lamp-homemade.html
- https://www.youtube.com/watch?v=ugzsjlBMmKI

Film Canister Rockets

(Chemistry and Physics)

Description:

Children will be exploring the chemical reaction between Alka-Seltzer and water. As the Alka-Seltzer tablet dissolves, carbon dioxide gases are released and will build *pressure* within the canister. Eventually the trapped gasses will result in blast off!

Materials:

- Film Canister
- Alka-Seltzer Tablets
- Water

Directions:

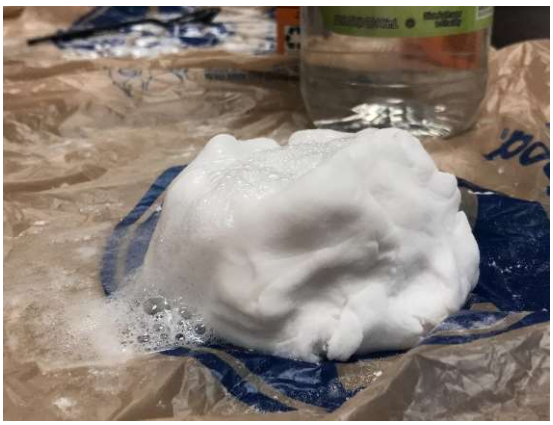
1) Pour about 5ml of water into a film canister.
2) Place half an Alka-Seltzer tablet into the canister.
3) Quickly snap on lid (tightly) and place upside down on the ground.
4) Move back quickly and wait for blast off!

Additional Resources:

- https://sciencebob.com/build-a-film-canister-rocket/

Erupting Slime

(Chemistry)



Description:

See how chemicals can react to make slime stretchy and erupt like a volcano!

Materials:

- Bowel and Spoon
- Elmer's Glue
- Baking Soda
- Buffered Saline Solution (Contact Lens Solution)
- Vinegar
- (Optional) Food Coloring

Directions:

1) Pour one bottle of glue (½ cup) into a bowel.
2) Use a spoon to mix in ¼ teaspoon of baking soda and food coloring.
3) Add a few drops of saline solution and mix. Repeat until a stringy ball is formed (about 30 drops).
4) Put a few drops of saline solution on your hands and use them to mix the slime until it is no longer sticky.
5) Use your hands to mix in more baking soda until the slime becomes gritty (about ½ cup).
6) Form the slime into a volcano shape with a hole in the middle.
7) Pour a couple teaspoons of vinegar in the volcano and watch it erupt!

Additional Resources:

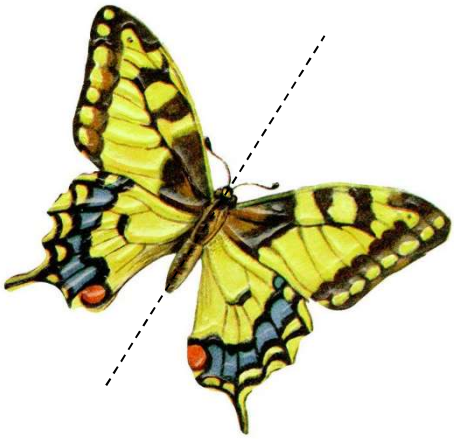
- https://www.steampoweredfamily.com/activities/erupting-slime-a-slime-stem-activity/?fbclid=IwAR3Hmyr187OacS6Rs8i7-ZJTCF6jgMEUX7Voz84ZmCMXA3RON-Vof0mVxGU
- https://littlebinsforlittlehands.com/basic-slime-science-homemade-slime-for-kids/
- https://www.livescience.com/60682-polymers.html

Symmetrical Butterfly

(Biology)

Description:

If something is *symmetrical*, it means one side of it mirrors the other. Lots of things in nature are symmetrical, such as butterflies, bees, trees, and leaves. What other things can you think of?



Materials:

- Paper
- Paint
- Brushes

Directions:

1) Fold your paper in half to find the center.
2) Paint whatever you want on one side of the paper but try to keep it centered around the fold line.
3) While the paint is still wet, fold the paper in half along the same line.
4) Look how symmetrical your picture is!

Additional Resources:

- https://solarsystem.nasa.gov/planets/in-depth/
- https://science.nasa.gov/science-news/science-at-nasa/2003/02oct_goldilocks
- https://www.youtube.com/watch?v=p6mf0YpNFH8

Sustainable Window Plants

(Environmental Science and Biology)

Description:

Sustainability is the principal that resources should be used wisely so they do not run out and do not negatively impact the environment or society.
One sustainable practice is to reuse things instead of tossing immediately. One thing you can do with plastic bottles, cups, or any small container, is use them as planters. This also gives you the opportunity to study how plants grow. These tiny pots are perfect for growing herbs you can keep right in the kitchen!

Materials:

- Plastic bottle, cup, or whatever you can find
- Soil
- Seeds: basil, rosemary, and sunflowers work well
- (Optional) Name tag and some color markers to label your plants

Directions:

1) For plastic bottles, cut off the top third. Cover the sharp edge with tape.
2) Fill most of the way with soil.
3) Sprinkle in three to five seeds depending on their size.
4) Cover the seeds with about half an inch of soil.
5) Wait for the seeds to sprout, watering whenever the soil looks dry.
6) Watch for roots, stems, and leaves!

Additional Resources:

- https://northernhomestead.com/what-to-grow-in-an-indoor-edible-window-garden/

Author's Note:

Thank you so much for spending time looking through this booklet! Stay tuned to http://randolphscience.org/ for updated event information, video resources, and more. We have really enjoyed compiling these activities, and look forward to seeing everyone at the next Randolph College Science Festival!

Our Best Wishes,

- *Hailey (Physics) and Paige (Chemistry and Environmental Science)*
- *Little Scientists 2020 Interns*