



How Do Leaves Breathe?



A wonderful visual experiment that shows how leaves actually produce oxygen from photosynthesis. This experiment can be done in your home with materials that you may find in your very own backyard.

Materials:

- Large bowl (anything that's clear)
- Water (lukewarm)
- Leaf (freshly taken from tree)
- Small rock

Instructions:

1. Fill a large bowl with lukewarm water. You can use a glass or plastic bowl.
2. Head outside and find a large leaf. You'll want to remove a leaf from a tree or plant and not just pick one up off the ground as we want an 'active' leaf for the project.
3. Place the leaf in the bowl of water and put a small rock on top of it so it is fully submerged under the water.
4. Put the bowl in a sunny spot.
5. You will see results within 30 minutes to an hour.

Results: Take a peek a few hours later. You will see small bubbles that form around the leaf and the edges of the bowl. As in the process of photosynthesis the leaves convert sunlight to energy. As a leaf creates energy, it needs to dispose of the extra oxygen it no longer needs.

Resource Link:

<https://www.kcedventures.com/blog/how-do-leaves-breathe-a-simple-science-experiment-for-kids>





Jumping Indian Corn Experiment

Fall is a perfect time of year to explore with Indian corn. Engage and observe with your family with this fun solution and liquid mixing experiment.

Materials Needed:

- Tall jar (mason jars work well)
- Popcorn or Indian corn kernels
- Baking soda
- Vinegar
- Water
- Spoon

Instructions:

1. To get started, fill your jar with 2 cups of water. Ask your child if the water is a liquid or a solid? Then add a couple tablespoons of baking soda to the water.
2. Stir to dissolve the baking soda as much as possible. Talk about what happened when the baking soda dissolved. This could lead to a fun extension activity testing different solids to see if they dissolve in water.
3. Add corn kernels to the water and baking soda. Ask your child to make a prediction of what will happen when he or she drops the solid corn kernels in the water.
4. Slowly add $\frac{1}{4}$ cup of vinegar to liquid. Ask your child to share observations. He or she can draw a picture of observations made.

Results: When baking soda is mixed with vinegar they produce a gas. The gas these two ingredients make together is carbon dioxide. The carbon dioxide bubbles lift the corn, but as the bubbles pop, the corn falls back down.

Resource Link:

<http://onetimethrough.com/hopping-corn-science-activity/>



Water Cycle Experiment

This water cycle experiment is a great observational experiment that allows for great discussions on how our water cycle works. Bring the rainy weather from the outside into the indoors with your family.

Materials Needed:

- Glass or jar
- Water
- Shaving cream
- Food coloring (preferably blue)

Instructions:

1. Ask your child to pour water into the glass, leaving about an inch from the rim.
2. Carefully add a layer of shaving cream to the water. The shaving cream represents a cloud and the water is the atmosphere.
3. Add a few drops of blue food coloring to the shaving cream. The weight of the food coloring will start to push through the shaving cream and fall down through the water that's in the glass. This will look just like streaks of rain falling.
4. You can explain what is occurring by making connections between what is happening in the experiment to what they see in their own environment. Here are a list of questions to ask your child: What do you observe? In what ways is this experiment like our weather? What happens when the clouds get too full of rain droplets?

Resource Link:

<https://laughingkidslearn.com/rain-cloud-science-experiment/>





What Makes Ice Melt Faster?



What a great way to stay warm and cozy indoors while doing a fun science experiment. This observational experiment explores using different solutions to see which will melt ice faster. Your children will enjoy participating in the experiment and trying to figure out what melts first.

Materials Needed:

- Three bowls with ice
- Timer
- Sand
- Salt
- Labels

Instructions:

1. Fill each bowl with ice cubes.
2. Label first bowl "ice", second bowl "sand" and third bowl "salt."
3. Pour sand on top of the ice in bowl two.
4. Pour salt on top of the ice in bowl three.
5. Observe the bowls every 10 minutes. The results should be apparent in 30 minutes.

Results: To find out the results please read about it on the link provided down below. Enjoy exploring like scientists at home!

Resource Link:

<http://www.pinayhomeschooler.com/2015/12/simple-experiment-what-makes-ice-melt.html>



Resources

Resources for parents

- <http://talkingisteaching.org/assets/public-files/STEM-Tipsheet-Families.pdf>
- https://www2.ed.gov/parents/academic/help/science/part_pg6.html#p6

Early resources and videos to help children learn Math and Science

- <http://talkingisteaching.org/resources>
- <https://www.stevespanglerscience.com/blog/2014/10/08/early-childhood-science-education-is-important/>
- https://d3lwefg3pyezlb.cloudfront.net/docs/Early_STEM_Matters_FINAL.pdf
- <https://vimeo.com/180894660>
- <https://vimeo.com/180894660>
- <http://toosmall.org/lets-talk-about-math>
- <https://cptv.pbslearningmedia.org/science/>
- <https://www.youtube.com/watch?v=NUOzVynk4Ao> (Amaryllis time lapse video)

STEAM and Experiment activities for teachers

- <https://steamcorner.wordpress.com>

Boston Children's Museum Stem Activities

- <http://www.bostonchildrensmuseum.org/sites/default/files/pdfs/STEMGuide.pdf>

Experiment resources

- <https://littlebinsforlittlehands.com/preschool-stem-activities-science-experiments/>

Free STEM printable resources

- <http://crisscrossapplesauce.typepad.com/files/science-tools-card-sort.pdf>
- <http://thestemlaboratory.com>
- <https://www.myteachingstation.com/worksheets/math>
- <https://www.montessorinature.com>
- <http://www.montessoriprintshop.com>

Engineering

- <http://successfulstemeducation.org/resources/engineering-emphasizing-“e”-stem-education>

Research about benefits of STEM

- https://dreme.stanford.edu/sites/default/files/september_2016_dreme_4-pager.pdf
- http://joanganzcooneycenter.org/wp-content/uploads/2017/01/jgcc_stemstartsearly_final.pdf
- http://www.joanganzcooneycenter.org/wp-content/uploads/2012/01/jgcc_takeagiantstep1.pdf

Updated STEM Standards

<http://ngss.nsta.org/AccessStandardsByTopic.aspx>

Quick Reference Curriculum Framework Mathematics Massachusetts Standards

- <http://www.doe.mass.edu/frameworks/math/2017-06qrg-smp-pk-2.pdf>