

STEM OUTREACH PRESENTS:
**STEM EACH DAY KEEPS
THE BOREDOM AWAY**

THE RAINBOW EDITION



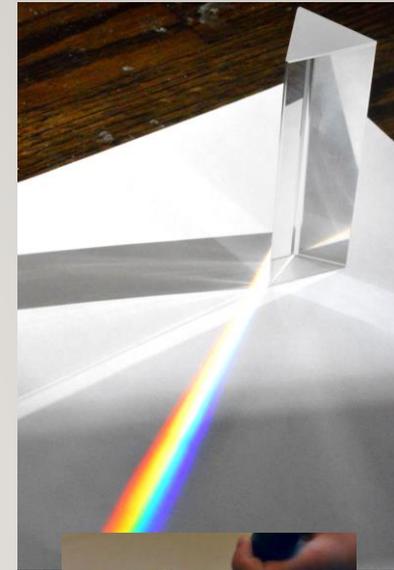
MAKE A RAINBOW

SUPPLIES: PRISM –OR– CLEAR CONTAINER AND MIRROR, FLASHLIGHT, OR CD*

<https://www.rookieparenting.com/make-your-own-rainbow-science-experiment/> and

<https://thepinterestedparent.com/2017/02/make-explore-paint-rainbows/>

- Pre-K to 2nd grade
 - Discuss the idea that a rainbow comes from light passing through water in the sky. While moving the objects around to form the rainbow, you can discuss how rainbows can only be seen in certain directions (back to the Sun).
 - Once you have created the rainbow, have your child point out each of the colors.
- 3rd to 6th grade
 - Introduce density and refraction. Focus on the idea of light passing through water in the sky, which is a change in *density* that bends the light, *refraction*. This would be a good opportunity to talk about the difference between reflection and refraction.
 - While creating your rainbow, discuss how the refraction and reflections can only be at certain angles; therefore, a rainbow can only be seen when your back is to the Sun.
- 7th to 12th grade
 - Introduce density and refraction. Focus on the idea of light passing through water in the sky, which is a change in *density* that bends the light, *refraction*. This would be a good opportunity to talk about the difference between reflection and refraction.
 - While creating your rainbow, discuss how the refraction and reflections can only be at certain angles; therefore, a rainbow can only be seen when your back is to the Sun. Set up targets around the room and have your child move the setup to make a rainbow on the target.



*All versions of this experiment work best when projected on a white surface, paper, cardboard, wall, etc.

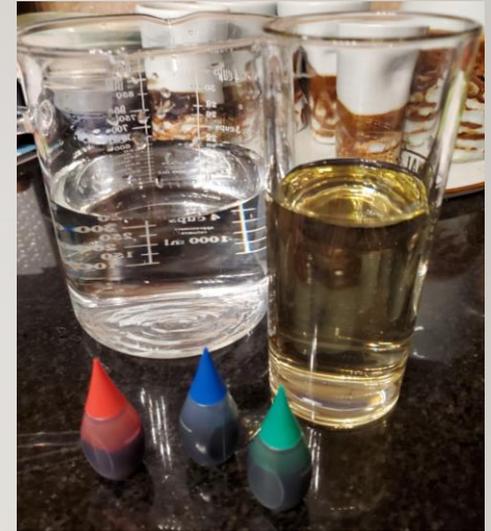
**Use this link to make a rainbow with a CD. For an added bonus, take paints, markers, or crayons and color in the projected rainbow.

***For a good refraction experiment try this: <https://gosciencekids.com/refraction-light-glass-water-play-steam-kids/>

RAINBOW RAIN

SUPPLIES:VEGETABLE OIL AND FOOD COLORING

- Pre-K to 2nd grade
 - <http://www.sciencefun.org/kidszone/experiments/water-fireworks/>
 - Introduce the concept of density. Objects can look the same and be the same size, but one can be a lot heavier.
- 3rd to 6th grade
 - <https://www.metrofamilymagazine.com/simple-science-experiment-oil-water-and-food-coloring/>
 - Introduce the concept of density.
 - After completing the above link, use the Pre-K to 2nd grade link for a fireworks show!
- 7th to 12th grade
 - <https://www.scientificamerican.com/article/create-underwater-fireworks-with-chemistry/>
 - Introduce the concepts of solutions, miscibility, and density.
 - After completing the above link, use the Pre-K to 2nd grade link for a fireworks show!



NATURE RAINBOW

SUPPLIES: COLOR WHEEL

<https://mothernatured.com/printables/nature-color-wheel-printable/>

- There is no need to download the color wheel in the link; you can make one! It will work best with a piece of cardboard as backing.
- You can also bring some clear tape along with you to attach your samples instead of clothespins
- This is perfect for a springtime walk!
- Talk about the difference between trees and bushes, flowers and leaves, etc.
- Talk about the parts of plants: roots, leaves, stem, stigma, etc.

<https://www.dkfindout.com/us/animals-and-nature/plants/parts-plant/>

- Talk about the lifecycle of a plant: seed, sprout, tree, flowers, pollen, seed.

<https://science4fun.info/life-cycle-of-plants/>

- To make this more detailed, have your child determine what type of plant each sample is after your walk.
- You can also try these: <https://www.scholastic.com/parents/school-success/learning-toolkit-blog/make-nature-walk-bracelet.html>.



A WALKING RAINBOW

SUPPLIES: PAPER TOWELS, FOOD COLORING, 6 CUPS

<https://www.messylittlemonster.com/2018/06/rainbow-walking-water-science-experiment.html>

- Pre-K to 2nd grade
 - Discuss the colors of the rainbow.
 - Try working through the worksheet in the link by having your child add colors. This can lead into discussion of color theory: <https://www.colormatters.com/color-and-design/basic-color-theory>.
 - Do not tell them what is going to happen; try to have them “hypothesize.”
- 3rd to 6th grade
 - Lead a scientific discussion on color theory: <https://www.colormatters.com/color-and-design/basic-color-theory>.
 - Discuss the scientific method and have your child try to follow its steps for this experiment.
- 7th to 12th grade
 - Lead a scientific discussion on color theory: <https://www.colormatters.com/color-and-design/basic-color-theory>.
 - Also, lead a chemistry discussion on capillary action: <https://www.thoughtco.com/definition-of-capillary-action-604866>.
 - Discuss the scientific method and have your child try follow its steps for this experiment.



*For a shortened version of this experiment, try <https://www.thebestideasforkids.com/grow-a-rainbow-experiment/>.

RAIN CLOUDS TO RAINBOWS

SUPPLIES: SHAVING CREAM, FOOD COLORING, AND GLASS CONTAINER

<https://onelittleproject.com/shaving-cream-rain-clouds/>

- Pre-K to 2nd grade
 - Discuss that rain comes from clouds. If you want to extend the lesson, discuss the different types of clouds:
<https://www.pinayhomeschooler.com/2018/01/type-of-clouds-for-preschoolers.html>.
- 3rd to 6th grade
 - Begin this experiment by discussing the water cycle:
<https://gpm.nasa.gov/education/water-cycle>.
- 7th to 12th grade
 - Please use this experiment in coordination with others about the water cycle and cloud formation. This is a very helpful link: <https://learning-center.homesciencetools.com/article/clouds-and-rain/>.



*The more concentrated the food coloring mixture, the faster it will “rain.” When the mixture has a higher water content, you will need to be patient for the rain to start.

**The link uses a dropper to add in the food coloring mixture, but a teaspoon or medicine syringe works just as well!

GET CONNECTED.

Science: <http://www.weatherwizkids.com/>; <https://switchzoo.com/>;
<https://www.ua.edu/news/2020/04/ua-satellite-team-offering-virtual-space-lessons/>

Technology: <https://www.typingclub.com/>; <https://www.tynker.com/>

Engineering: <https://www.teachengineering.org/>;
<https://pbskids.org/designsquad/parentseducators/>

Mathematics: <https://www.youcubed.org/>; <http://weusemath.org/>

Children's Health and Wellbeing:

- <https://www.actionforhealthykids.org/>
- <https://www.virtualmusicalinstruments.com/>
- <http://stemteachingtools.org/news/2020/guidance-for-supporting-science-learning-during-covid-19>
- <https://www.moma.org/calendar/exhibitions/>

* Some links throughout this document are not accessible on government computers or in Internet Explorer. If you are experiencing difficulty opening a webpage, try changing to Chrome or Firefox.

FOR QUESTIONS OR HELP PLEASE
CONTACT

STEM@MDA.MIL

WE WOULD ALSO LOVE TO RECEIVE
PHOTOS OF YOU AND YOUR CHILDREN
“STEM-ING OUT”!

