

SELECTED ECLIPSE ACTIVITIES FOR EDUCATORS

A Guide by Andrew Fraknoi (Jan. 2023)

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Activities about Eclipses and Viewing them Safely

The Yardstick Eclipse: How Eclipses Work. From the Astronomical Society of the Pacific (requires a yardstick and other household items to model how eclipses happen):

https://astrosociety.org/file_download/inline/083a7833-c1a7-4270-aa5a-d48e036e424a An article discussing a student-centered version of this activity can be found at: <https://eclipse.aas.org/sites/eclipse.aas.org/files/Miranda-et-al-SS-Oct2016.pdf> An elegantly laid-out version of the yardstick activity is at: <https://nso.edu/wp-content/uploads/2018/10/YardstickEclipse.pdf>

Modeling Eclipses. From the Pacific Science Center & Dennis Schatz (use hula hoops and other easy material to teach about why eclipses are rare):

<https://eclipse.illinois.edu/ProjectASTRO-ModelingEclipses.pdf>

How Can the Little Moon Hide the Giant Sun? From NASA Sun-Earth Day (making a simple scale model of the Sun and Moon and using them for comparisons and calculations):

https://sunearthday.nasa.gov/2007/materials/eclipse_smallmoon_bigsun.pdf

(Or: https://lawrencehallofscience.org/wp-content/uploads/2022/06/diy_ss_bigsun_smallmoon.pdf)

(Or: <https://www.nisenet.org/catalog/exploring-solar-system-big-sun-small-moon>)

Solar Eclipses. A Science Snack from the Exploratorium (two people use their thumbs to create eclipses): <https://www.exploratorium.edu/snacks/solar-eclipses>

How to View an Eclipse with a Cereal Box. From NASA Goddard (video and transcript):

<https://svs.gsfc.nasa.gov/12638> Or see a written & illustrated version at:

http://hilaroad.com/camp/projects/eclipse_viewer/eclipse_viewer.html

Build a Pinhole Viewer. From the University of Illinois (using a long tube):

<http://eclipse.illinois.edu/pinhole.html>

Pinhole Viewer: Shoebox Version. From the Space Science Institute and the book *Solar Science*, published by National Sci. Teaching Assn. Press (make safe sun viewer from a shoebox): <http://clearinghouse.starnetlibraries.org/astronomy-and-space/114-pinhole-projection-in-a-box.html>

Using a Sunspotter Telescope for Safe Viewing. From Robert (Barlow Bob) Godfrey: (use a commercial, but not very expensive, telescope for viewing the Sun safely any time): <http://www.cnyo.org/2013/09/20/barlow-bobs-corner-x-2-the-sunspotter-solar-telescope-activity-for-the-sunspotter-solar-telescope/>

Make your Own Safe Solar Viewer. From T. R. Richardson, College of Charleston. (Making a solar projector, for \$10 of surplus materials, that can show the public the Sun): https://richardson.people.cofc.edu/safe_solar_folder/index.html (Another projector project, using binoculars, is from the Exploratorium – click on the video at the top of the page: <https://www.exploratorium.edu/eclipse/how-to-view-eclipse>)

Instructions for Building a Sun Funnel for Your Telescope. From the American Astronomical Society (detailed instructions on building a nice projection screen for showing the Sun with a telescope; for people who have some construction skills and know how to use an amateur telescope): <https://eclipse.aas.org/sites/eclipse.aas.org/files/Build-Sun-Funnel-v3.2.pdf>

Do-It-Yourself Sun Science. From NISENet (download an app, or get pdfs for doing a variety of sun-related activities, including looking at real-time images of sunspots from a space mission): <https://www.nisenet.org/diy-sun-science-app>

Bear's Shadow. From NISENet (for really young children, this activity, from a picture book, helps them think about how shadows – the essence of eclipses – happen: <https://www.nisenet.org/catalog/exploring-earth-bears-shadow>

Activities for Getting to Know the Moon

Exploring Lunar Phases with a Daytime Moon. From the Astronomical Society of the Pacific (use plastic balls on sticks to model the phases of the Moon in the sky): https://astrosociety.org/file_download/inline/d135613e-3498-4413-b520-d85979c7f131

Does the Moon Rotate? From the Night Sky Network (requires plastic “moon balls” and Earth globe): <https://nightsky.jpl.nasa.gov/docs/MoonRotate.pdf>

Why Does the Moon Have Phases? From the Night Sky Network (also requires plastic balls): <https://nightsky.jpl.nasa.gov/docs/MoonPhases1.pdf>

Observing and Understanding the Causes of Lunar Phases. From Dennis Schatz, Pacific Science Ctr. (observing, modeling, and understanding the phases of the Moon): <http://www.dennisschatz.org/activities/Lunar%20Phases.pdf>

Phases of the Moon. From the University of Washington (short activity getting to know the phases through students acting out the motions):

https://drive.google.com/file/d/1s7_GhT2fZ0UKqZYsjpR8hrF-ih4s37GM/view

Make a Moon-phase Calendar and Calculator. From NASA's Jet Propulsion Lab (construct from a master you can print out):

<https://www.jpl.nasa.gov/edu/learn/project/make-a-moon-phases-calendar-and-calculator/>

Earth's Bright Neighbor. From the Lunar & Planetary Institute (make a scale model of the Earth-Moon system using common fruits):

<https://www.lpi.usra.edu/education/explore/marvelMoon/activities/whatIf/brightNeighbor/>

Penny Moon. From the Lunar & Planetary Institute (model the Moon's synchronized motions using coins):

<https://www.lpi.usra.edu/education/explore/marvelMoon/activities/moonMyths/pennyMoon/>

Lunar Photography Guide. From NASA (includes detailed instructions for cell phones and more sophisticated cameras): <https://moon.nasa.gov/moon-observation/photography-guide/>

Creating Craters. From *My Sky Tonight* at the Astronomical Society of the Pacific (on how craters are made and erased):

https://astrosociety.org/file_download/inline/d6746e97-ad52-4065-af3a-c60ef11cf52d Also see *Craters on the Earth and Moon* from JPL for older audiences: <https://nightsky.jpl.nasa.gov/docs/CratersMoonEarth.pdf>)

Did We Actually Land on the Moon? From the Astronomical Society of the Pacific (using web resources to investigate and debunk moon-landing denial theories):

https://www.researchgate.net/publication/268895007_Did_We_Actually_Land_on_the_Moon_An_Activity_and_Symposium

Activities for Getting to Know the Sun

Scale Model of the Sun and Earth. From NASA Sun-Earth Day (making a model that shows size and distance to scale):

https://sunearthday.nasa.gov/2007/materials/solar_pizza.pdf

Where Does the Sun Set? From the Canadian *Discover the Universe* Project (keeping track of where on the horizon we see the Sun):

https://www.discovertheuniverse.ca/files/ugd/c07f8f_750cbda1358f43ffa1d96573c7d20c52.pdf

What Color is the Sun? From the Stanford Solar Center (student investigation into the colors of the Sun, of water, and the sunset): <http://solar-center.stanford.edu/activities/SunColor/What-Color-is-the-Sun.pdf>

Measuring the Sun's Size. From the Lawrence Hall of Science (using a pinhole viewer and some geometry):

https://www.nisenet.org/sites/default/files/catalog/uploads/diy_ss_measure_sun_size.pdf

Discover the Sunspot Cycle and How Fast Does the Sun Rotate? From the book *Solar Science* by Dennis Schatz and Andrew Fraknoi (two sample activities, using images of the Sun with sunspots to understand more about the Sun's activity and rotation):

<https://static.nsta.org/pdfs/samples/PB403Xweb.pdf>

Making a Sun Clock. From Dennis Schatz (using shadows and a dial to tell time):

<http://www.dennisschatz.org/activities/Pocket%20Sun%20Clock.pdf> (See also:

Equatorial Sundial. From the McDonald Observatory (construct and use a sundial, with the master design provided):

<https://stardate.org/sites/default/files/pdfs/teachers/EquatorialSundial.pdf>

A Family Guide to the Sun. From the Space Science Institute Space Weather Center (a booklet of puzzles, pictures, poetry and projects for kids aged 6-13):

<http://www.spaceweathercenter.org/education/02/02.html>

Educational Resources that are Not Activities:

National Solar Observ. Educational Videos: <https://nso.edu/for-public/eclipse-webcast/>

Eclipse Training Resources from the Rice University Space Institute:

https://space.rice.edu/eclipse/eclipse_training.html

Eclipse Resources from the Exploratorium (includes an excellent series of very short videos about individual concepts; scroll down the page to get to them):

<https://www.exploratorium.edu/eclipse>

When The Sun Goes Dark. From the National Science Teaching Association Press (a book for kids by A. Fraknoi & D. Schatz on understanding how eclipses happen):

<https://my.nsta.org/resource/108257>

American Astronomical Society Eclipse Web Pages (with information, links, authoritative safety guide, and free images): <https://eclipse.aas.org/>

Finding the Circumstances for any Upcoming Eclipse from your City or Region:

<https://www.timeanddate.com/eclipse/>

Project to Distribute Eclipse Glasses and Information through Public Libraries:

<https://www.starnetlibraries.org/about/our-projects/solar-eclipse-activities-libraries-seal/>

This listing was compiled by astronomer/educator Andrew Fraknoi (with help from L. Peticolas, D. Schatz, V. White and others.) For Fraknoi's other guides for educators and more about his work, see: <http://fraknoi.com>