

Solar Eclipse Double-Header in October 2023 and April 2024

What School Administrators and Other Education Leaders Need to Know

Many people in the U.S. experienced the beauty and sense of wonder of the 2017 total solar eclipse—when the Moon crossed in front of the Sun. The Sun went dark, and the day turned into night. Now is the time to prepare for the next solar eclipses in North America—a “Double-Header” on Saturday, October 14, 2023 (an annular—or ring of fire—eclipse) and Monday, April 8, 2024 (a total eclipse). Rarely does nature offer us such clear

teachable moments, when our students can *experience* key science concepts while observing a spectacular celestial event first hand.

In 2017, many administrators were unprepared when their science teachers asked to take students outside to view the eclipse. So, for the upcoming eclipses, we’ve prepared this document to give you the background you need to help your teachers make the two eclipses an unforgettable learning experience.



Annular eclipse showing ring of solar surface (ring-of-fire) still visible as Moon passes in front of the Sun

Photo by Kevin Baird



Total eclipse showing solar corona as the Moon passes in front of the Sun and completely covers the Sun's surface

Photo by Cary Sneider during August 2017 Eclipse

Eclipses and the Science Curriculum

Science-learning standards in most states require students to know what causes the phases of the Moon and how the clockwork-like motion of the Sun and Moon produce eclipses. How better to learn about these concepts than by going outside and experiencing the real thing? After the 2017 eclipse, educators enthusiastically described school-wide activities that made the day an unforgettable experience:

We planned an entire day of STEM events for our students centered around the sun, moon, shadows, UV light, etc. We ordered NASA APPROVED glasses in May prior to the end of the previous school year for EVERY student and staff member. I invited a meteorologist to the school to speak to the kids ahead of time about what to expect, how to view safely, etc. We had an eye doctor come to the school and talk to all our students about eyesight and how and why we protect them from the sun the morning of the eclipse.

I began talking to my administration about the eclipse about 6 months ahead of time, and then about how students could safely view, since they would be at school during the actual eclipse. I am fortunate that my principal is very supportive of science and we worked together to make it a fantastic, once in a lifetime experience for our students and families.

—Elementary School teacher in Forsyth County Schools, Georgia

Some enterprising educators even used the event to raise funds for school activities:

A group of students and I were able to get money fronted to us to purchase (legit) eclipse viewing glasses. We sold them for \$1 and made a small profit for future projects. We taped a small flyer to each pair to help communicate the details of our viewing times. It was really fun and we easily sold out (500 pairs).

— Earth Science Teacher in Boise, Idaho

Eclipse AUGUST 21, 2017
EXPERIENCE THE 2017 ECLIPSE ACROSS AMERICA <http://eclipse2017.nasa.gov>

SAFELY WATCH THE SOLAR ECLIPSE

IN STYLE!
\$1.00 each

On Monday, Aug 21st
here in Boise
THE ECLIPSE WILL LAST FROM
10:00am - 12:50pm
MAXIMUM COVERAGE OF 99%
WILL OCCUR AT 12:7 pm

Visit the Green Team
at the concession stand
during break
every Tuesday and Thursday
until they run out!

Eclipses Can Be Viewed Safely

While one needs to use safe viewing techniques during an eclipse (see next page), the benefits of observing the eclipse greatly outweigh the risk, which can sometimes be exaggerated. For example, research during the 1999 solar eclipse in the United Kingdom found:

“There were no recorded cases of permanent visual loss.”

—from the article *Eclipse Retinopathy* in the journal *Eye* (2001) 15,148-151 © 2001 Royal College of Ophthalmologist

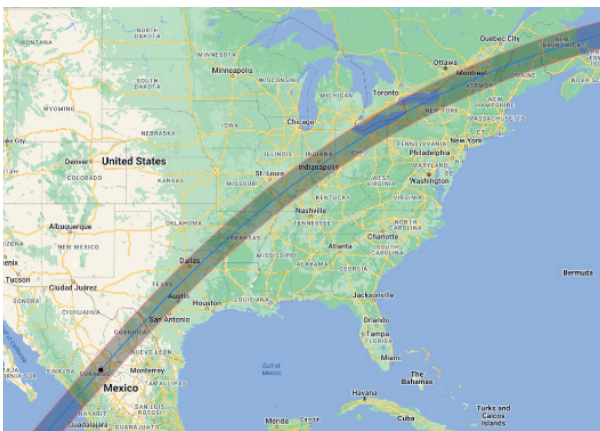
The 2023 and 2024 solar eclipses

For both of the upcoming eclipses, the entire continental US will see a partial eclipse, while you need to be in the narrow path shown on each map below to see the annular or total eclipse. Larger maps and information about what each eclipse looks like in different cities are found at www.timeanddate.com/eclipse/solar/2023-october-14 for the 2023 eclipse and at www.timeanddate.com/eclipse/solar/2024-april-8 for the 2024 eclipse.



October 14, 2023 annular eclipse path—a Saturday

Credit: Xavier Jubier



April 8, 2024 total eclipse path—a Monday

Credit: Xavier Jubier

Safe Eclipse-viewing Techniques are Easy to Find and Use

Teachers can order class sets of safe-viewing glasses, which allow students to look at the Sun without hurting their eyes.



Photo by Mark Margolis

It is not necessary, however, to have such glasses to get to see the eclipse. There are many indirect ways to view the eclipses. One popular method uses a colander found in most homes. If you hold the colander with your back to the Sun, images of the eclipse project on to the pavement or a wall.



NASA Image by Joy Ng

See pages 12 to 15 in the NSTA (National Science Teaching Association) Educator's Solar Eclipse Viewing Guide at https://static.nsta.org/pdfs/SolarEclipses2023_Educator.pdf for a variety of ways to view a solar eclipse safely.

Helping Your Educators Make the Most of the Eclipses

Resources from the NSTA:

1. NSTA Science Update web seminar of October 20, 2022. Recording available to everyone at: my.nsta.org/resource/125329
2. NSTA Press publishes two books about eclipses that provide reading for kids and learning experiences for teachers:
 - a. Solar Science: Sunspots, Seasons, Eclipses and More (a book for teachers): my.nsta.org/resource/102100/solar-science-exploring-sunspots-seasons-eclipses-and-more
 - b. When the Sun Goes Dark (a book for kids): my.nsta.org/resource/108257
3. The 2023-24 Educator’s Solar Eclipse Viewing Guide from NSTA (https://static.nsta.org/pdfs/SolarEclipses2023_Educator.pdf) contains information regarding:
 - a. What causes eclipses of the Sun
 - b. Where and when each eclipse will occur
 - c. What to expect during each eclipse
 - d. Safe eclipse viewing strategies
 - e. Suggestions for how to make each eclipse a school wide and/or community event.
 - f. How to find eclipse experts to assist with eclipse-related activities

Other Resources

4. Eclipses and eye safety page from the American Astronomical Society: eclipse.aas.org/eye-safety
5. Guide to basic classroom activities on eclipses, the Moon, and the Sun that are free on the Web: bit.ly/teacheclipse
6. NASA’s page on eclipses: solarsystem.nasa.gov/eclipses/home

We wish you clear skies for the 2023 and 2024 eclipses. May your school and community get to enjoy and learn from the events.

This administrator’s guide was written by veteran astronomy educators Dennis Schatz and Andrew Fraknoi. Schatz was the first astronomy educator to be President of the National Science Teaching Association (NSTA) and Fraknoi is the lead author of the most frequently-used introductory textbook in astronomy in the U.S. This guide is produced and distributed by NSTA.