Explorers Preschool Curriculum Supplement

# Let's Explore A Solar Eclipse



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## Let's Explore: A Solar Eclipse

This supplemental Explorers Curriculum packet is intended to support programs with preschoolers and younger schoolagers as they experience the upcoming solar eclipse. A solar eclipse is a short-lived, weather-dependent event that young children have difficulty understanding. However, the *buzz* about the eclipse, at home, at school, and on television, will surely capture their attention!

This packet encourages us to embrace the moment by focusing on parts of the eclipse experience that children can understand and experience first-hand. It's a perfect time to explore light, shadows, sun, and moon!



## Fast Facts About a Solar Eclipse

# Here's some background information for adults that may help you answer children's questions—and your own!

- A solar eclipse happens when our moon passes between the Earth and the sun, blocking some or all of the sun's light. Even though the moon is much smaller than the sun, it is also much closer to the Earth. To us, on Earth, it appears that the moon is covering the sun.
- During a total solar eclipse, there are a few minutes of dusk-like dimness in the middle of the day. The sky gets darker gradually as the moon's shadow blocks light from the sun. If the sky is clear, you can see how shadows change as the eclipse begins. The darkest period (totality) lasts for just a few minutes. Then, the sky gradually becomes lighter again.

#### Fast Facts About a Solar Eclipse, continued

- Special eclipse glasses or a handheld solar eclipse viewer can be used to safely view the eclipse. Looking at the sun without adequate protection can permanently damage your eyes. An eclipse isn't uniquely dangerous, though. Looking directly at the sun without special eye gear is **never** safe. (Sunglasses are not enough!)
- Total solar eclipses happen about once every 18 months but are only viewable in certain parts of the world. An eclipse can only be seen from locations where the shadow falls. It's estimated that most places worldwide only experience a total solar eclipse once every 400 years. After the 2024 eclipse, the next total solar eclipse will occur in 2026, but you'll have to travel to the Arctic, Greenland, or Iceland to see it!
- The 2024 eclipse is special because the sun will be at the peak of its solar cycle, making it appear especially bright. Because the moon lies a little closer to the Earth this year as compared to other recent eclipses, the 2024 eclipse will also last a little longer than usual. Plus, much of Arkansas is in the narrow *path of totality*—the part of the world where the moon will completely block the sun. That means that lots of tourists will be here to witness the event. An *umbraphile* is someone who travels to see a total eclipse!
- The 2024 eclipse will occur on the afternoon of April 8. People in the southwest corner of Arkansas will be the first to see the eclipse. Texarkana will experience totality around 1:46 p.m. The shadow will slide northeast across the state over the next 20 minutes or so. Up in Piggott, totality will occur around 1:59 p.m. People in the Northwest and Southeast corners of the state won't see a total eclipse, but they will see a crescent-shaped partial eclipse.

Click here to find out what to expect where you live!

• A solar eclipse can be seen in the daytime. A lunar eclipse, on the other hand, is visible at night. This occurs when the Earth blocks the light from the sun, making the moon appear dark. The next total lunar eclipse we'll be able to see will occur just before 2 a.m. on March 14, 2025.

## Preparing to Explore a Solar Eclipse with Preschoolers

- 1. With your teaching team, think about and discuss the questions below.
  - What do our children know about eclipses so far? What background knowledge do they most likely have? How does a solar eclipse relate to things they've experienced and know well, such as daytime, nighttime, and shadows?
  - What seems to interest children most about the solar eclipse? If eclipserelated festivals or festivities are happening near you, children may be eager to talk about these events!
  - How do individual children seem to feel about the eclipse? Some children may feel unsure about the excitement leading to the eclipse; they'll turn to you for reassurance and consistency. Some children may be full of questions and eager to talk about and investigate the eclipse.
  - What might children learn and do as we explore the solar eclipse? What new words or concepts could they begin to understand?

Remember: Our goal isn't for children to simply memorize and recite facts. This is a chance to activate curiosity, construct knowledge, and make memories!

- 2. Let families know that the group is interested in the eclipse. Think together about ways that families can be involved. For example, a parent who enjoys stargazing might come to talk with your group, or families might be invited to join you for a mid-day eclipse watch party!
- 3. Gather books and materials to add to learning centers and to use during small group experiences. You'll find many suggestions in this packet.



## Should We Take Children Out to View the Eclipse?

This decision should be made based on the size of your group, the age and abilities of children within the group, and the number of supervising adults who will be present.

*It's never safe to look at the sun without special eye protection.* If a child glances directly at the sun on a sunny day, the uncomfortable glare makes them squint and look away almost immediately. We don't usually need to remind children not to stare into the sun.

But during an eclipse, the sun is partially blocked by the moon. You might be able to look directly at it without squinting, but that doesn't mean it is safe. The bright edges of the eclipse can still burn the retina of the eye and may cause scarring and vision loss.

Children and adults can safely view the eclipse wearing special, protective glasses. When the moon fully covers the sun, it is safe to take the glasses off. They'll need to be worn again when the sun reappears. It may not be possible for just one or two adults to supervise and guide a large group of young children during this exciting event.

If you want to view the eclipse with children, consider inviting families and other mature volunteers to help ensure that children keep their glasses on. It's important to note that this year's eclipse overlaps rest time for many Arkansas preschoolers. Some children may be drowsy or cranky from the schedule change. More adults mean more one-on-one support for children!



If you're collecting or purchasing eclipse glasses for yourself, children, and/or families, be sure your source is reputable. Many fake glasses that are not dark enough to protect your eyes are being sold! The American Astronomical Society has created <u>a list of</u> <u>suppliers</u> selling glasses that meet safety guidelines. A <u>Pinhole Viewer</u> provides another safe way to view the eclipse but may not hold children's attention.

If you decide that viewing the actual eclipse is not a fit for you, consider celebrating in another way. For example, one Arkansas program has planned a "glow party" in their gymnasium. After dancing with glow sticks in the dimmed room, everyone will settle in to watch and cheer as a projector simulates the eclipse. (To simulate an eclipse of your own, try setting the playback on <u>this video</u> to .25 speed) The 2024 solar eclipse is a big deal for many communities, and we can help children feel like they are part of the action, whether we go outdoors or not!

## Let's Talk About a Solar Eclipse

Here are some interesting words you might use as you talk with children.

### Solar

Having to do with the sun.

#### Lunar

Having to do with the moon.

### Umbra

The darkest part of the moon's shadow, within which the entire sun is blocked.

### Totality

The time during an eclipse when the sun appears to be totally covered.

### Partial

Incomplete. A partial eclipse is seen when the moon covers only part of the sun. This occurs before and after totality.

### Crescent

This is the semi-circular shape we see when the sun is partially covered.

### Corona

The corona is the sun's atmosphere. It is visible during a total eclipse and looks like a glowing ring around the sun.

### Tourist

A tourist is someone who travels or visits for pleasure. Many tourists are expected to come to Arkansas to see the total eclipse!

#### Astronomer

Someone who studies planets, stars, and other celestial objects. An eclipse provides a great opportunity for astronomers to study our star, the Sun!

The solar eclipse also invites us to talk about and compare light using words such as *bright*, *dim*, *dusky*, and *dark*.

## **Book Look**

Here are some books you might consider sharing with children. Look for eclipse-inspired collections at your favorite children's library!



*Eclipse* Andy Rash, Scholastic Press, 2023

A boy and his father head cross-country to a campsite to experience a solar eclipse. This gentle story reinforces time concepts while richly colored illustrations contrast the moments before, during, and after an eclipse!

## A Few Beautiful Minutes

Kate Allen Fox and Khoa Le, Little Brown Books for Young Readers, 2023

This poetic story tells about the few minutes when everyone stops what they're doing to look at the sky. Beautiful illustrations!





## National Geographic Readers: Day and Night

Shira Evans, National Geographic, 2016 This non-fiction book isn't about the eclipse, but it helps children build the background knowledge they need to understand it. Preschoolers will appreciate the vibrant photographs, while kindergarteners and first graders enjoy the dual-level "you read, I read" co-reader format.

## Someone is Eating the Sun

Ruth A. Sonneborn and Eric Gurney, Random House, 1974

Hen notices, "Someone has taken a bite out of the sun!" She runs to tell the other farm animals in this Henny-Penny-inspired tale. This book is out of print but is worth searching for at used booksellers and children's libraries. It would be perfect to retell with puppets or masks!





### The Sun and the Moon

Carolynn Cinami DeCristofano and Taia Morley, HarperCollins, 2016

This friendly, non-fiction book provides celestial facts and includes extension activities for K-2 students. (Some could be adapted for preschool, as well.)

Sun Up, Sun Down Gail Gibbons, Clarion Books, 1987

This gentle, informative book is loaded with preschool-friendly explanations about the sun. It's a factual resource you might turn to often as questions about shadows, rainbows, and other phenomena bubble up!





### *Totality: An Eclipse Guide in Rhyme and Science* Jeffrey Bennett, Big Kid Science, 2022

It's intended for older students, so you won't want to use this book for whole-group storytime. Instead, add it to your science center to invite children to discover its photos and diagrams at their own pace.

## What Color is Night?

Grant Snider, Chronicle Books, 2019

It's more than black and white! The luminous illustrations in this lyrical book will support your group's exploration of day, night, and eclipse light and colors! This short-and-sweet book is ideal for the youngest preschoolers, too.





## When the Sun Goes Dark

Andrew Fraknoi and Dennis Schatz, NSTA Kids, 2017

This award-winning book from the National Science Teachers Association provides lots of straightforward information about solar eclipses. The written content is way too long for preschoolers. Plan to summarize and simplify as you talk together informally about the realistic, relatable illustrations.

## **Exploratory Activities**

### Exploring with Flashlights

Collect a basket of flashlights for children to explore. Notice which ones are brighter, which are dimmer, and which have wide or narrow beams. What else do children notice? Experiment with how the flashlight beam changes as you move the light closer or farther from a surface. Dim the lights and use the flashlights to explore your room or another favorite space.

This super-simple activity provides a context for children to learn or practice vocabulary they'll use as they discuss the eclipse. It may also spark their interest in shadows!

#### Shadow Exploration

For this activity, you'll need a blank wall. If you don't have one, you can use a screen or hang a light-colored sheet or shower curtain. Place a bright lamp several feet away on the floor or table, with the beam directed at your blank surface.

Invite children to move in the space between the lamp and the wall, experimenting with shadows they can make. How do the shadows change as they move closer to the light source? How about if they move closer to the wall?

Invite children to try holding toys or other objects in their hands. When they stand with their back to the lamp and hold up an object, can they see its shadow on the wall? What happens if they hold an object in front of their body rather than out to one side?

This informal experiment invites children to explore the relationship between light sources and shadows. Through trial and error, they'll consider how objects obstruct light, much like how the moon obstructs the sun during a solar eclipse!

#### An Eclipse Map of Our Own

It seems like eclipse maps are **everywhere** this year! Hang a large map of the United States on your wall. Outline the state of Arkansas with a highlighter and add a heart or star to mark your town. Invite each family to add stickers to the map to represent someone special who lives elsewhere. For example, it might be a grandparent who lives on the other side of the state or an uncle who lives on the other side of the country.

Use a highlighter or colored cellophane to mark the path of the 2024 solar eclipse. (You can find the eclipse path <u>here</u>.) Look at the stickers on your map to notice who will be able to see the total eclipse and who will not. People who can't see the solar eclipse will still be able to see a partial eclipse. Do children know anyone who is coming to visit, especially for the eclipse? These could be special class visitors.

Young children don't fully understand maps yet but are often interested in them especially when adults ensure that their first map experiences are playful and positive. Consider creating cards to mail to all the special people on your map.

#### A Holdable Eclipse

An eclipse happens when the moon aligns "just so" between the Earth and the sun. When this happens, the light from the sun is temporarily blocked. You can explore this with small groups of preschoolers using a light source and a round object. You can use a table lamp as your light source. Or, cover a window with dark paper with a large circle cut out of the middle to let light in.

Explain to children that you are pretending that your light source represents the sun. Provide each child with a paper plate or round object representing the moon. Holding the "moon" at arm's length, can children position it to block out the light from the "sun"? If you slowly move the moon sideways, when does the sun become visible again? Notice when you can see a little, part, most, and all of the sun.

Move to the other side of the room and try again. Older preschoolers and schoolagers may want to try to find the perfect spot here the sun's glowing corona can be seen as a bright ring around the edge of their plate.

This simple experiment helps children build a concrete understanding of how the moon will pass between us and the sun during the eclipse.

#### **Daytime Moon**

As you talk about the eclipse, children may be surprised to hear that the moon will move in the sky during the daytime. We usually see the moon at night! We might assume that the moon comes up when the sun goes down.

However, we can often spot the moon in the daytime sky. In the days before a full moon, you can find the moon rising in the eastern sky before the sun sets. In the days after a full moon, you can look to the west to find the moon setting after the sun has risen. Because a solar eclipse coincides with a new moon, you and your group should be able to see it in the sky in the mornings about a week before the eclipse. Try to spot it from your playground or another outdoor vantage point.

The moon will become smaller and less visible each day. Talk with interested children about how the moon's shape and position change each day. A "new moon" is still there in the sky, but becomes shadowed and hard to see as it moves between the Earth and the sun. You won't be able to see the moon at all on eclipse day until the eclipse begins!

Helping children pause to notice and think about their world supports cognitive development and scientific reasoning. As educators, we strive to engage children in natural moments of wonder! Looking for the daytime moon may even become a new tradition with your children and families.

#### **Exploring Crescents**

Print and cut out the eclipse cards on the following page. If desired, you can glue the cards to chipboard or laminate them to make them sturdier. Magnet tape can be added if you would like to use your cards with a cookie sheet or other magnet board.

With individuals or small groups of interested children, try arranging the cards from smallest to largest crescents of the moon or sun. You could also use two sets of cards for a matching game. The crescent shape can be seen in an eclipse as the moon moves in front of the sun. The crescent of visible sun becomes smaller and smaller until totality, and then it grows larger again.

Be on the lookout for the crescent shape in your environment. Orange wedges are crescentlike, and so are the tips of our fingernails. What else can you find?

Recognizing the crescent shape and matching or sequencing the size of crescents are math skills. Noticing change is a math skill, too. An eclipse provides an excellent opportunity to talk about change!













#### **Crescent Cookies**

Invite children to help you mix up a batch of your favorite <u>sugar cookie</u> or snickerdoodle dough. After you press or cut out round cookies, use a drinking glass or biscuit cutter to cut a crescent shape out of each cookie. The cut-out dough can be re-rolled to make more cookies, or the cut-outs can be baked on a separate cookie sheet.

Later, children may become interested in nibbling round cookies and crackers into crescent shapes. They'll also enjoy exploring round cutters with playdough or clay.

Baking together invites children to count, measure, and notice how ingredients change as they are mixed. Talk about the steps of the recipe as you go. You can also talk about temperature and set your timer as cookies go in the oven.

### Once Upon an Eclipse

Make up a playful story about a nighttime creature, such as an owl or cricket, that gets surprised by the eclipse. Or, perhaps your story will be about a confused daytime creature that heads to bed. Invite children to draw pictures inspired by your story.

When we sometimes tell children stories without using an illustrated storybook, we encourage them to visualize characters and events in their minds. That's a valuable cognitive skill!

#### Sky Blue

Provide cups or bowls with blue and white tempera paint, brushes, and large sheets of white paper. Invite children to try mixing and swirling the blue and white paint together. What happens? Does this remind you of the daytime sky?

Next, introduce cups or bowls of black paint. What happens when black is mixed with blue? Does this new, deep indigo blue remind you of the night sky? Allow children to continue to mix lighter and darker combinations of paint, applying the paint to their paper in any way that interests them.

Sunlight, rather than paint, makes our sky appear lighter or darker. This is also a perfect opportunity to introduce the words *tint* and *shade*.

#### **Chalk Corona**

Turn a mixing bowl upside down on a large sheet of dark blue or black paper. Invite interested children to take turns holding the bowl steady and using white and/or yellow chalk to trace thick lines around the bowl. This is a good partner activity: one child can hold the bowl while another traces. It will require problem-solving to reach/reposition as needed to trace all the way around! Keep going until everyone who wants a turn to chalk has had one.

Next, remove the bowl. You should see a thick ring of chalk lines around where the bowl used to be. Show children how to use their fingers to smudge the chalk out, toward the edge of the paper. When finished, this will resemble the sunlight (corona) visible around the edges of a moon during an eclipse. The word *corona* means *crown* in Latin. Why might that be? *Umbra* means *shadow* in Latin. Which part of your chalk work represents the umbra?



Although this experience uses chalk and paper, it isn't an art activity. Instead, it is a collaborative exploration of the shape and attributes of an eclipse's corona and umbra. Plan it during playtime or small group time so children don't have to wait long before and after their turns.

Later, offer bowls, chalk, and paper for children's free-choice art use. They may replicate your corona activity, or they may have other ideas of their own.

#### Let's See an RV!

What does a recreational vehicle have to do with a solar eclipse? Plenty, if you're in a part of the state where thousands of tourists converge to view the event! Invite a family member or friend of your program to bring an RV for children to see. Park it in a low-traffic area so that children can visit in small groups to take a closer look.

Children are almost always eager for firsthand experiences like this one. They are full of questions and stories! Your group may want to take photos of the RV to look at later. You could also add an RV/camper playset for playtime. Children process new ideas and try out new words through play.

#### Pajama Party

Invite everyone to wear their pajamas on the big day. Discuss: How is an eclipse like nighttime? How is it different? Take a group portrait of everyone in their PJs and eclipse glasses!

Print and hang photos of events like this one or add them to a class album to look at and talk about later. Revisiting events in photos builds a sense of connection while supporting sequencing and recall skills.

#### **Eclipse Shadows**

If you decide that your group can safely go out to view the eclipse, keep an eye out for unique shadows all around you.

- Shadows may look sharper and brighter as the eclipse begins. That's because the remaining sunlight is becoming more focused.
- You'll see crescent-shaped shadows from leaves on trees or from the light shining through the holes of a colander.
- If you look at a flat surface, like a sidewalk, right before or after totality, you may see shadows that look like thin, wavy lines. Those are atmospheric shadow bands that can only be seen during an eclipse!



If your program is closed on eclipse day, or many children may stay home that day, consider sharing this activity with families. The minutes before and after an eclipse may seem long to waiting children. A shadow search gives them something fascinating to look for and talk about!

#### More to Do

Your eclipse explorations may pair well with the Explorers Preschool Curriculum *Day and Night* topic. You can find it here: <u>https://bit.ly/EPCPackets</u>

## Learning Center Extensions

Here are some examples of materials that can be added to classroom learning centers to support children's play and exploration.

Not all materials need to be provided. Choose materials based on what you have available and the ages, interests, and abilities of the children in your group.

## Dramatic Play Area

- Solar eclipse glasses, sunglasses
- If your town will host an eclipse-related festival, consider flyers/brochures and tshirts. Children may want to incorporate a music stage with audience seating into their play. Or, perhaps they would like to create a food truck or carnival-style concession booth.
- If many families are camping in your area to view the eclipse, consider props for pretend camping such as a tent, pretend campfire, lantern, small ice chest, backpacks, and forest animal soft toys or puppets.

## **Block Building Area**

- Pieces of fabric to drape over block structures
- Battery-operated LED tealight candles

## Science Area

- A collection of child-safe flashlights
- Tray of things to explore with flashlights such as a small colander, an unbreakable locker mirror, a simple shadow puppet, an old CD, and/or translucent plastic magnet tiles or party cups
- Solar system poster, <u>eclipse diagram</u>, or <u>eclipse sequence chart</u>.

## Art Area

- Paint in shades of deep blue, light blue, bright yellow, or the eclipse-inspired colors of your choice
- Dark paper with chalk and/or metallic markers
- Round and crescent paper cut-outs, hole punches, and/or stickers for collage