Viewing the 2017 Great American Eclipse

On a normal day, staring straight into the sun can harm your eyes. Eclipse day is no different. NASA warns, “IT IS NEVER SAFE TO LOOK DIRECTLY AT THE SUN’S RAYS – EVEN IF THE SUN IS PARTLY OBSCURED.”

The intense light from the sun can damage the retina. There are three safe ways to view the eclipse:

1. Direct viewing of the sun using special solar eclipse glasses or viewers
2. Projecting an image of the Sun on a light colored surface with a pinhole projector
3. Watching a live stream from the TV, computer, or mobile device

Projecting an image of the Sun with pinhole projectors

For safe viewing, always keep your back towards the Sun while looking at a pinhole projection, and never look at the Sun through the pinhole. With these in mind, there are many options to create projectors, and students can be engaged with the engineering design process before and during the eclipse. What would be the best design for a large image? What would be the best design for a sharp, clear image? How do different size and shape holes affect the image? How do different types of materials affect the image?

The simplest and quickest way to safely project the Sun can be made with two index cards. Poke a hole in one of the cards (a pinhole, hole punch or shape of your choice). With your back towards the Sun and the other card on the ground (or held below by another student), hold the pinhole card above allowing the Sun to shine through the hole and onto the other card. Adjust the distance to achieve the desired image. On eclipse day it will become apparent that the image will be inverted. Let students discover this for themselves by comparing the projected image to what they see through the eclipse glasses or viewers.

Another option is a pinhole box projector. It requires more materials and time but is a good alternative design to evaluate if you are having students engineer projectors.

Watching a live stream

NASA TV – Eclipse Across America
https://eclipse2017.nasa.gov/eclipse-live-stream
https://www.nasa.gov/eclipselive

Exploratorium Total Solar Eclipse: Live from the USA – iOS and Android apps also available for viewing
https://www.exploratorium.edu/eclipse

Eclipse Ballooning Project
http://eclipse.stream.live/