Module 1: What are the parts of the Sun?

Activity C: Solar Research in Action! – Create a Pinhole Camera

Overview

There are several ways you can safely observe the Sun, and hopefully sunspots, yourself. The easiest way is to use a pinhole camera. A pinhole camera works by projecting the Sun's light through a tiny pinhole onto a white sheet of paper, which allows you to easily and safely observe the Sun. Galileo safely observed the Sun by projecting its image from a telescope onto light colored paper, which is how he discovered sunspots. Galileo made many drawings of the Sun that traced the path of sunspots across the surface of the Sun. His original solar sketches still survive today!

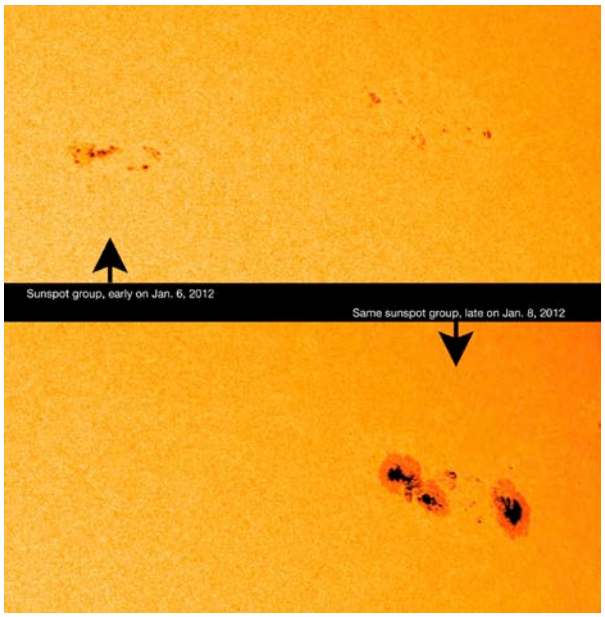


Image: NASA

Team Goal

As a group, your goal is to construct a pinhole camera to project a visible light image of the Sun in order to safely observe the Sun and calculate the Sun's diameter.

Materials

- "Create a Pinhole Camera" lab sheet
- Sturdy box with lid (shoe box)
- 2 index cards
- Pin
- Tape
- Aluminum foil
- Ruler
- Meter stick
- Scissors or utility knife
- Calculator
- Pencil
- Sunny day!

Engage & Explore!

1. BUILD Knowledge:

About SDO and safe Sun viewing

Watch these videos to learn about how NASA's Solar Dynamic Observatory (SDO) is observing the Sun and how your team can safely observe the Sun, too!

Intro to SDO Video

SDO Science Overview Video

How to Safely View the Sun Video

WARNING: TO AVOID SERIOUS, PERMANENT EYE DAMAGE, NEVER LOOK DIRECTLY AT THE SUN WITH YOUR EYES, TELESCOPE OR BINOCULARS UNLESS YOU USE THE PROPER SOLAR FILTERS (sunglasses are NOT proper solar filters)!!!

2. CREATE Resources & CONNECT to the Real World:

Create a pinhole camera

Together as a team, carefully read through the instructions on how to make a pinhole camera and review the images and demonstration camera to assist your team. Then, collect your materials and build your own pinhole camera! Use your pinhole camera to project an image of the Sun to estimate the diameter of the Sun. Finally, create a scale Sun-Earth model based on the Sun's diameter and distance from Earth. Your team's pinhole camera (plus images taken with it) and scale Sun-Earth model will be used as an artifacts for your team's Module 4 SDO Exploration Museum 3-D Solar Exhibit.

Create a Pinhole Camera Lab Sheet (see attached file)

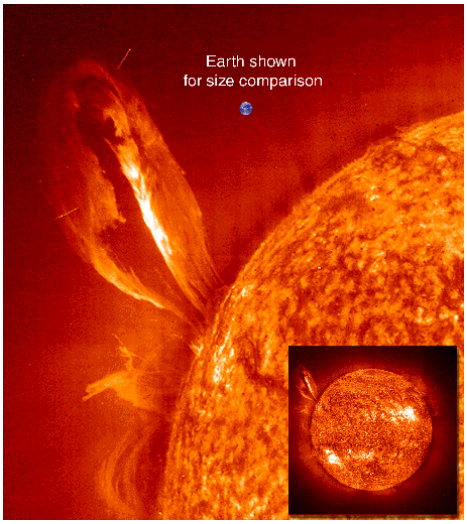
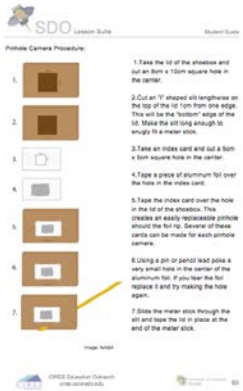


Image: NASA



Awesome, your team safely observed the Sun. Galileo would be proud!