UAMN Virtual Family Day: Sun

Build A Model Solar Probe

Discover the Parker Solar Probe and embark on a mission to the Sun!

People can't travel to the Sun because it is too hot, but we can send a spacecraft! Our spacecraft, based on the Parker Solar Probe, will have several tools to tell us about the Sun.

Parker Solar Probe. Image: NASA.

Materials Needed:

Instrument Shapes printable (or draw your own), toilet paper tube, thin cardboard (from a cereal box or similar packaging), glue, tape, scissors, aluminum foil, colored pencils or crayons.

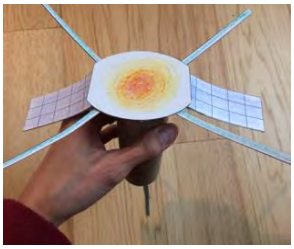
Instructions:

Step 1: Color each instrument shape. Glue them to thin cardboard to make them sturdier, then cut each one out.

Step 2: Tape the solar panels to the straight edges of the protective shield. Tape or glue four of the long thin rectangular probes to the back of the protective shield, one on each corner (see picture).

Step 3: Tape the protective shield on one edge of the toilet paper tube. Tape the last long thin probe on the other end of the tube.

Step 4: Wrap a piece of aluminum foil around the tube. This protects the electronic instruments from solar radiation.



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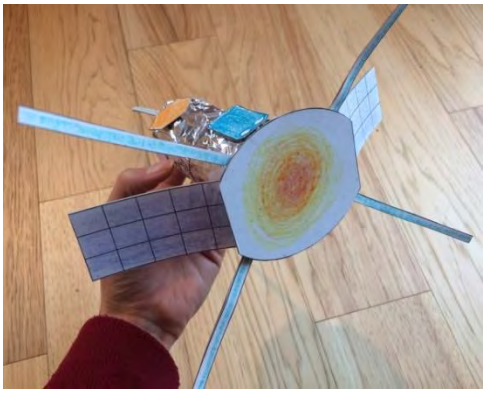
Build A Model Solar Probe, page 2

Step 5: Glue or tape the rest of the instruments around the tube: the small rectangle is a telescope, and the hexagon and circles are instruments to measure the solar wind.

Step 6: Add more features to your solar probe! What do you wonder about the Sun? What mysteries will your probe explore?

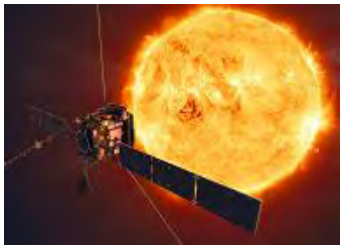


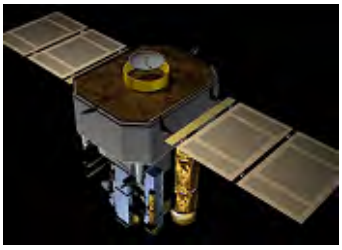
Did You Know? Scientists have sent many spacecraft to study the Sun, each designed for a specific purpose.

The *Parker Solar Probe* will fly closer to the Sun than any other spacecraft to study the Sun's corona (outer atmosphere).

The *Solar Orbiter* has special instruments to measure the Sun's magnetic fields, waves, and plasma.

The *Solar & Heliospheric Observatory (SOHO)* investigates both the Sun's internal structure and its outer layers.





Left to Right: Parker Solar Probe (NASA/Johns Hopkins APL/Steve Gribben), Solar Orbiter (ESA/ATG medialab), SOHO (NASA).

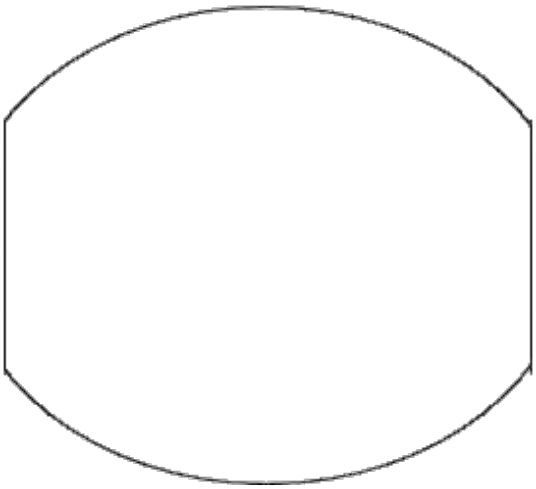
Try This: Design your own spacecraft to study the Sun!

- Think about what questions you want your spacecraft to investigate.
- What kind of instruments will you need? You could include cameras, microphones, telescopes, magnets, or sample collectors!
- Decide how you will protect your spacecraft from the Sun's radiation and heat.
- Use any craft materials you have available to build your model spacecraft. Be creative!
- Give your spacecraft a name!

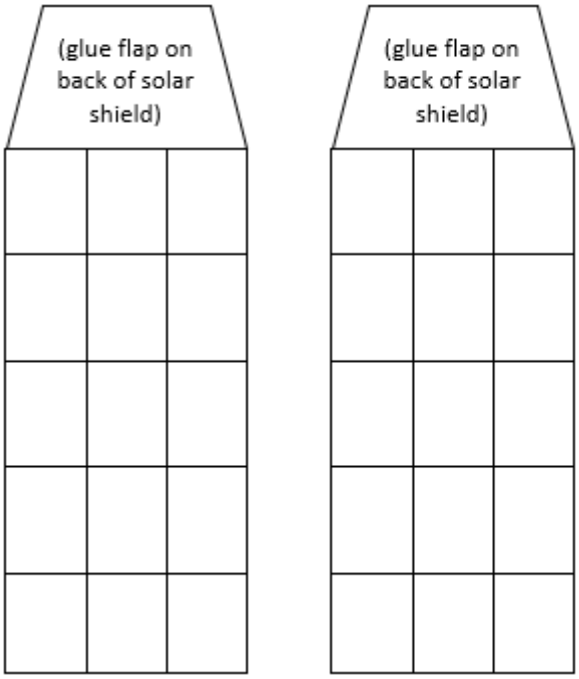
Solar Probe Instrument Shapes Printable

These shapes represent just a few of the features and instruments on the Parker Solar Probe.

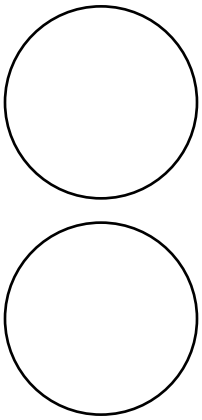
The **protective shield** protects the spacecraft from the heat of the Sun.



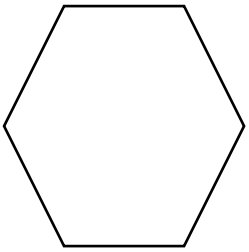
Solar panels absorb the Sun's energy to power the spacecraft.



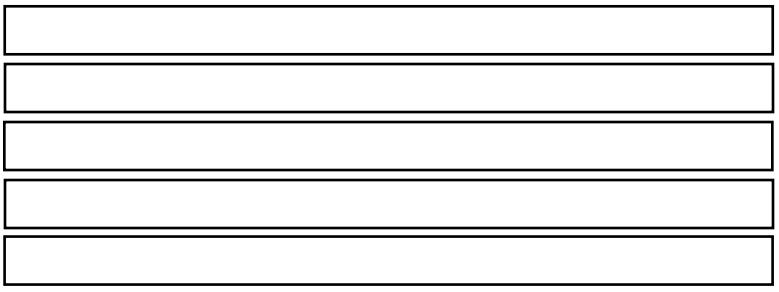
SWEAP instruments measure the solar wind.



The **ISOIS** instrument measures solar energy.



The **WISPR** telescopes take pictures of the sun's corona (outer atmosphere).



The **FIELDS** probes measure magnetic and electric energy.

Artist's conception of the Parker Solar Probe. *Image: NASA.*

Discover more about the Parker Solar Probe:

parkersolarprobe.jhuapl.edu

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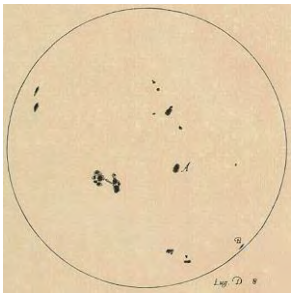
Exploring the Sun From Far Away

The Sun (also called Sol) is the star at the center of our Solar System. Its gravity holds the solar system together. The Sun's warmth and light make life possible on Earth.

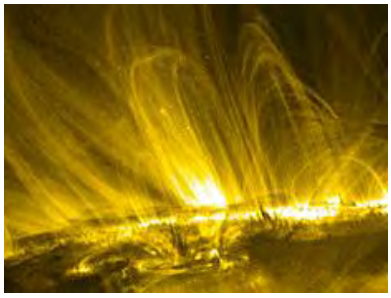
Left: The Sun's surface. Image: NASA/SDO.

We have always been curious to learn more about the Sun, the brightest object we can see from Earth. However, no one has ever traveled to the Sun. Instead, people have developed ways to explore the Sun from far away.

For thousands of years, people around the world have observed the Sun. They have used the Sun's movements and the changes in the amount of sunlight to keep track of times and seasons. Civilizations such as the Babylonians and Chinese recorded their observations of solar eclipses and sunspots. In 1612, the astronomer Galileo observed sunspots through a telescope. Since then, scientists have continued to develop new tools to help them explore the Sun.



One of Galileo's 1612 sunspot drawings. Image: Rice University.



Coronal loops on the Sun's surface. Image: NASA/TRACE.

In the 20th and 21st centuries, scientists have sent spacecraft to study the Sun close-up. In 1990, the Ulysses probe orbited the Sun three times. It helped determine that the Sun's magnetic field reverses every 11 years. The Solar & Heliospheric Observatory (SOHO) was launched in 1995 and is still operating over 25 years later!

In 2018, NASA launched the **Parker Solar Probe**, which will travel far closer to the Sun than any other spacecraft. The **Solar Orbiter**, which launched in 2020, will investigate the *heliosphere*, a giant bubble of charged particles and magnetic fields blown outward by the Sun. Together, the Solar Orbiter and the Parker Solar Probe will help us explore the Sun in more detail than ever before.

Artist's conception of the Solar Orbiter. Image: ESA/ATG medialab.

Follow the Solar Orbiter's journey to the Sun:
www.nasa.gov/solar-orbiter

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