

Please refer to the Teacher Resource document for information on how to use the worksheet for the activity.

Q1. Using the observations and conclusions from the activities you have completed in previous worksheets, **present your arguments** below for why the Sun does or does not have Seasons. Do you **agree or disagree** with your original hypothesis?

Expected Responses:

- I agree that the Sun has seasons. From the investigation, I learned that the Sun has a cycle of activity where every 11-14 years the Sun has lots of solar eruptions and sunspots. At other times in the cycle, it does not have any activity (solar minimum/Quiet Sun). The sunspots have magnetic fields and in some images of the Sun, I could see magnetic field lines. The Sun is made of plasma: charged particles of Hydrogen or Helium which move very fast and cause magnetic fields. The Sun does not always look the same. As the Sun goes through its cycle, the images show the plasma in the magnetic fields erupting from sunspots at certain times of the cycle. The sunspots can also travel across the Sun changing what the Sun looks like and acting a bit like wind or clouds moving through the Earth's atmosphere. The Sun is also rotating on its axis. This is similar to how seasons work on Earth. The seasons follow a cycle: Spring, Summer, Autumn, and Winter. The cycle of seasons on Earth is just 1 year long but the Sun's cycle is about 11-14 years long. All of these factors indicate that the Sun has seasons. Therefore, I agree with my original hypothesis.
- I disagree that the Sun has seasons. The Earth has seasons because of the way it orbits the Sun and the tilt of its axis. The Sun doesn't have a tilted axis rotation and it doesn't orbit a bigger star. The Sun has a cycle that is much longer than Earth's cycle. The Earth's four seasons fit into one cycle but the Sun has only two "seasons" - one when there are lots of sunspots and one when there are hardly any sunspots and this changes lots during the 11 years so I don't think it's the same way the seasons work on Earth.