

My Slice of the Universe – Seasonal Changes in the Sky

As the Earth moves through space orbiting the Sun, does our view of the Universe change? Do we see the same stars every night? Are there seasonal changes in the night sky? Let's model the Earth's trip around the Sun to find out.

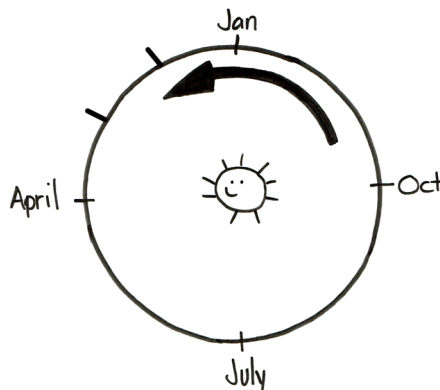
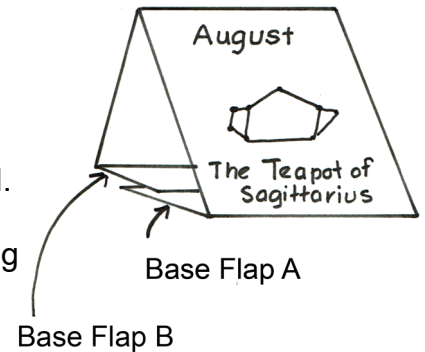
Vocabulary: Constellations, asterism, counter-clockwise

Materials: constellation tents, Earth tent, Sun drawing, scissors, glue or tape, student sheets

Procedures :

Create the Model

1. Cut out constellation tents on the solid lines.
2. Fold base flaps on the dotted lines.
3. Glue or tape flap A onto flap B to allow the constellation tent to stand.
4. Place the Sun in the center of the circle. Place the constellation tents around the outside of the circle. Start with January, then moving **counter-clockwise** (↻) place February, March, April, etc until you have all tents placed around in a circle.



Example of model

Use the Model

1. Which side of the Earth should face away from the Sun, day or night? The night side of Earth is our window to the universe because the Sun is not up. In January, our window to the universe points in the direction of the star cluster, The Pleiades. It appears very high in the January night sky. Many other groups of stars are visible, even those we are using for the surrounding months. I chose the constellations or groups that are high overhead at that time. For example, I show the Big Dipper asterism for May because it is high in the sky, but it is up for many months.
2. Place the Earth between the Sun and January. Can you find where January 1st would be? Where January 15th would be? And all the other days in January? To figure this out, notice where December is and where February is.

Slowly move the Earth counter-clockwise around the Sun and answer the questions below. Make sure to keep the night side pointed away from the Sun.

What motion does this model demonstrate? Rotation or Revolution

Questions:

- 1 Place your Earth at January 1st (in front of the right side of the January card). Which constellations do you think would be visible in the night sky? Keep in mind you should be able to see most of the constellations on your side of the Sun.
- 2 Which constellations are not visible on January 1? Why?
- 3 In ancient mythology, it is said that Orion and Scorpius are never seen together in the night sky because Orion was scared of the scorpion. After making your model what do you think is the real reason you cannot see them in the same night sky?
- 4 Estimate the location of your birthday. What constellation is high in the sky on your birthday? That is your slice of the universe!
- 5 Make a circular calendar and label with the months of the year. Remember to label counter-clockwise. Estimate and label at least 6 special days. You can label birthdays, holidays, or anniversaries.
- 6 Our calendar based on the Earth's orbit was divided into 12 months because that is how long the Earth takes to go around the Sun. Could you make a similar calendar based on the orbit of the Moon? It takes **about** 28 days (27.3 days to be accurate) to travel around the Earth. What unit of time is close to 28 days?

Please send any questions to srigsby@bmtisd.com or ask your teacher.

Art Connection Time

Nicolaus Copernicus was a Polish scientist who lived from 1473—1543. At that time, people thought the Earth was at the center of the Universe and the Sun, other planets, and all the stars orbited the Earth. Copernicus disagreed with this model and said the Sun was in the center and was orbited by the Earth and planets. His ideas lead the way for future scientists like Johannes Kepler, Galileo, and Isaac Newton to understand and describe the motions of the planets.

Learn more about the years Copernicus was living by recreating some art of his time.

Use this QR code or link to access the art lesson https://drive.google.com/file/d/1Bs0SPUIvlfXrnY_XCW_tbSUTlwNx2DQ9/view?usp=sharing



Flap B

January

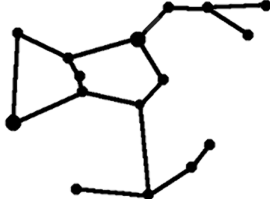


Pleiades Star Cluster

Flap A

Flap B

February

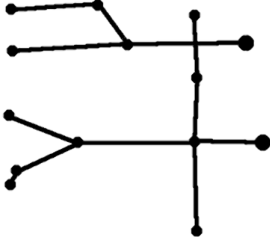


Orion

Flap A

Flap B

March



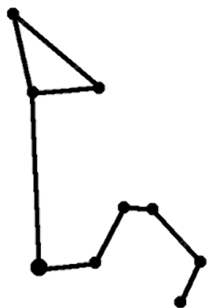
Gemini

Flap A

Constellation Tents Cut on the solid line and fold on the dotted line. Tape or glue Flap A over Flap B.

Flap B

April



Leo

Flap A

Flap B

May

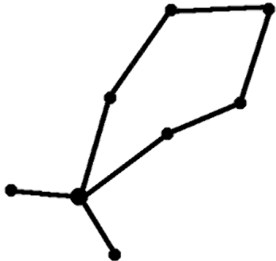


Big Dipper Asterism

Flap A

Flap B

June



Bootes

Flap A

Flap B

July

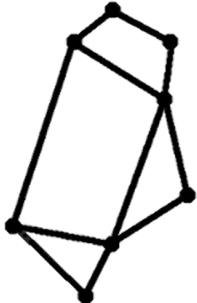


Scorpius

Flap A

Flap B

August

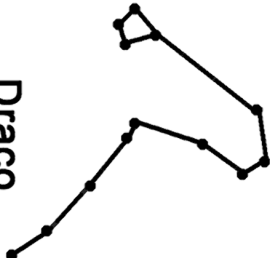


**The Teapot of
Sagittarius**

Flap A

Flap B

September

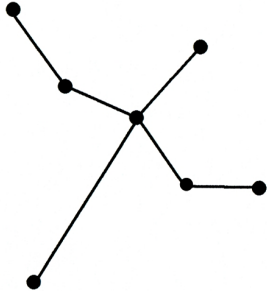


Draco

Flap A

Flap B

October



Cygnus

Flap A

Flap B

November



Pegasus

Flap A

Flap B

December

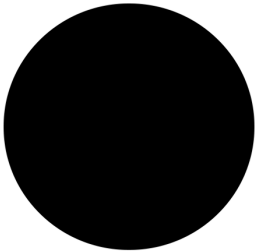



Cassiopeia

Flap A

Flap B

Night

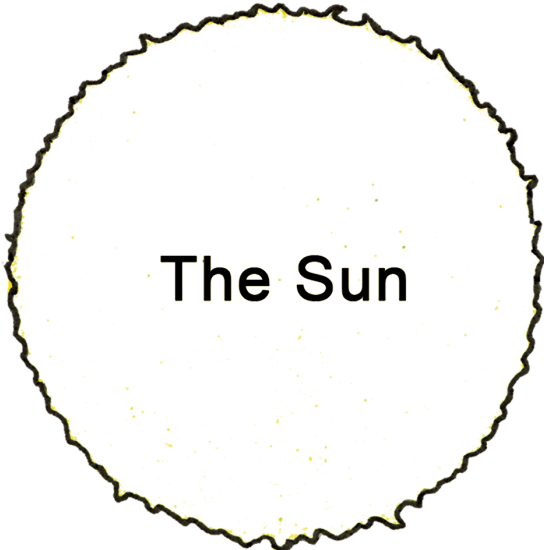




Day

Flap A

Flap B



The Sun

Flap A