

Name: _____

Stars Seem to Move During the Night (Lesson 3 Investigation 1)

Suppose you are outside one evening and find Orion shining just above a tree near your home. A few hours later, you go outside again and look for Orion in the same spot, but it is not there! You search the sky again and finally find it lower in the sky. What happened? Why did Orion move?



If you observed the stars throughout the night, they would appear to move. Each star trail in this picture shows the path of a star. But they only look like they are moving because Earth rotates.

If you observe the stars several times during a night, they will seem to move in an arc, or semicircle. If you could see the stars for an entire day, they would appear to move in a full circle. If you face north, the stars move in a counter-clockwise direction, and if you face south, the stars move in a clockwise direction. But they are not actually moving. Rather, the stars only look like they are moving because Earth is rotating.

Think about riding a moving bus. If you look at the seats on the bus, they do not seem to be moving, and you do not seem to be moving either. Everything on the bus seems still because these things are moving with you. Similarly, if you look around you while standing on Earth, everything on Earth, including you, seems to stay still.

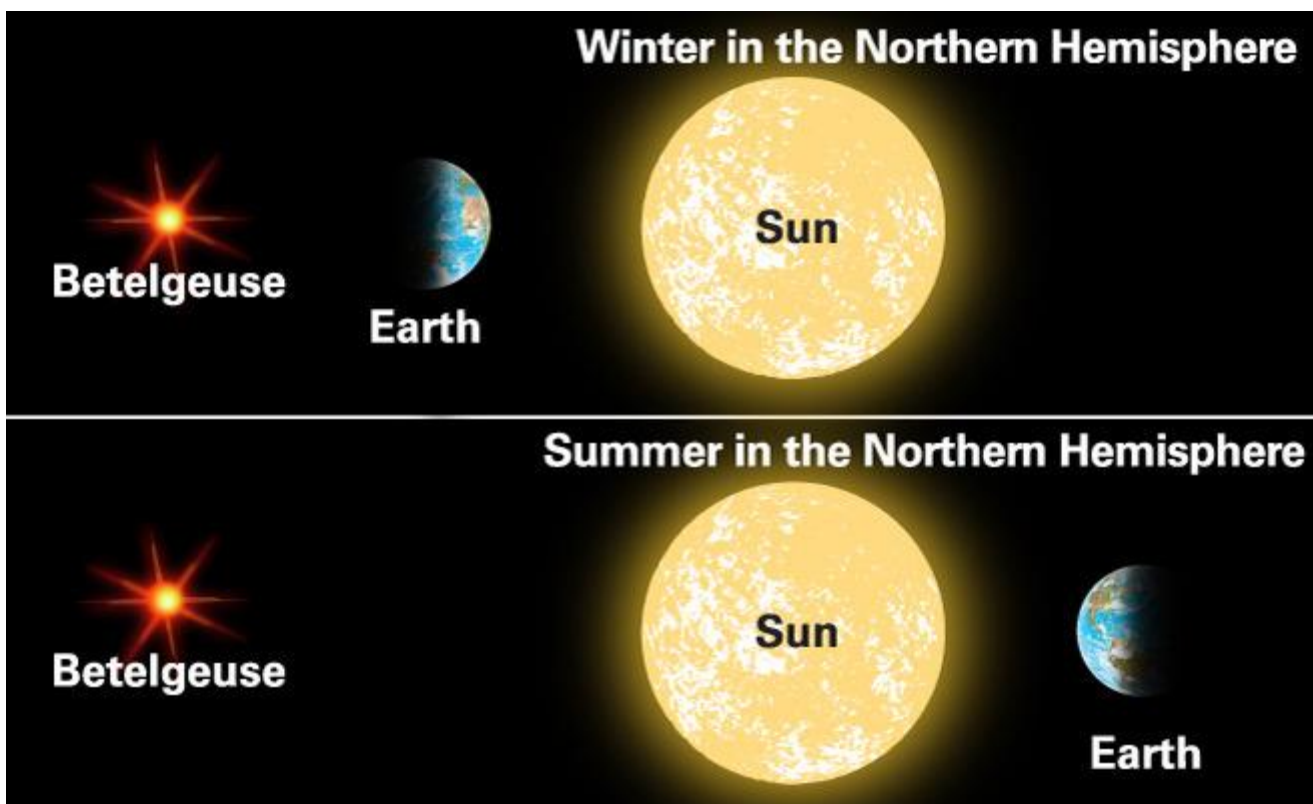
If you look out the window of a moving bus, buildings and trees appear to move past it. But you know that the buildings and trees are not moving. They only seem to move because you are moving in relation to everything outside of the bus. Like on the bus, if you look “outside” of Earth at the sky, you see that stars and other objects in space seem to be moving. But stars do not move in relation to Earth. Rather, you are moving in a circle as Earth rotates which makes objects that are not on Earth appear to move.

Name: _____

Constellations Seem to Change With the Seasons (Lesson 3 Investigation 2)

Orion is large and made of some of the brightest stars in the sky. So, it is one of the easiest star patterns to find. On a winter night in the Northern Hemisphere, you can probably see its brightly glowing stars. But if you look for Orion in the summer, you will not be able to find it at all. In fact, many stars that you can see in the winter are not visible in the summer, and many stars that you can see in the summer are not visible in the winter.

As you have learned, stars appear to move because Earth rotates. But another reason why they appear to move is because of Earth's orbit around the sun. If you observe a star pattern, such as Orion, at the same time of night for several weeks, you will see that its position in the sky changes. It may move higher or lower in the sky. Some stars, such as the around Polaris, never disappear from the sky. But other stars, such as those that form Orion, will rise and set as the change.



Constellations seem to change positions in the sky with the seasons. This happens because of Earth's orbit around the sun. This illustration shows how Betelgeuse, the brightest star in Orion, cannot be seen in the summer.

The stars you see at night depend on which direction the part of Earth you are on is facing. As Earth moves around the sun in its orbit, the night side of Earth looks out into a different part of space. The night side of Earth is the part of Earth that faces away from the sun. During the winter, the night side of Earth faces the part of space that contains Orion. In the summer, the day side of Earth faces Orion. So, Orion is in the sky during winter nights and summer days. But you cannot see Orion when it is in the day sky because the sun is so bright that other stars are not visible.