

Grade 4 Science  
Week of January 4 – January 8

Earth's Orbit

**The Earth is Moving!**



Earth's Rotation and Revolution: <https://youtu.be/l64YwNI1wr0>

The sun rises and sets every day.

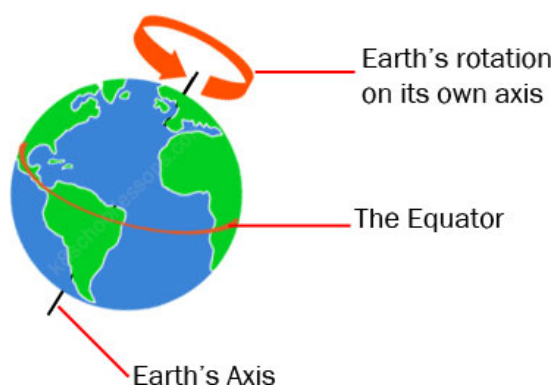
The earth is always turning or spinning on it's axis

An axis is an invisible line between the North and South poles

Each rotation around the axis causes day and bight

Patterns of the earth rotation causes seasons

**Earth's Rotation**



**Daily Rotation**

The light from the sun shines on half of the Earth at any given time. The side it shines on is **warmer** and **brighter**. The other side of the Earth faces away from the sun (it's dark) so it is **cooler** and **darker**. There is a line between these two we call the **axis**. Since the Earth is always spinning, we pass this axis each day.

When Earth spins on its axis, it is call **rotation**.

**Sunrise and Sunset**

As Earth rotates, it seems like the sun is moving across the sky, but it's really the Earth that is spinning. It takes 24 hours to complete one rotation, which is why there are 24 hours in one day.

It spins from West to East. If you were to hover over the North Pole in space, then it looks like the Earth spins in a counterclockwise rotation. The result is the sun's apparent motion from east to west in the sky. We see the Sun rise in the East and sets in the West.



Day and Night : <https://youtu.be/Wr-CRkSTYGs>

## Nocturnal and Diurnal Animals

A **nocturnal** animal is active at night and sleeps during the day.

A **Diurnal** animal is active during the day and sleeps during the night. We are Diurnal animals!



Diurnal vs Nocturnal Adaptations: <https://youtu.be/7rkPiZW6wyY>

## Shadows

**Shadows** are sneaky things: they run ahead of you, jump behind you, and sometimes even disappear completely!

Shadow- A dark shape made when an object **blocks light**. When you stand outside, your body blocks sunlight and that makes a shadow.



Following the Sun <https://youtu.be/1SN1BOPLZAs>

Your shadow changes size and shape during the day and then disappears when it gets dark.

Shadows move because the sun is constantly moving.

People used to use the sun to tell time, this is because the sun follows a pattern.

## Seasons

Earth moves in a circle around the sun once every 365.25 days. We call that path Earth's orbit.



Seasons and the Sun: <https://youtu.be/b25g4nZTHvM>

### Winter

As the Northern Hemisphere approaches winter, the North pole points away from the Sun, resulting in:

- the amount of daylight hours is reduced and night hours increase.
- As the season changes the amount of day and night also changes so that there are more hours of daylight than night during the summer.
- Surface temperature reduces because the Sun is not heating the surface for as long a period of time.

### Summer

Moving out of Winter and into Spring and Summer, the North pole points towards the Sun, resulting in:

- increasing amount of daylight and reduction in night hours.
- The day hours continue to increase until it reaches the maximum number of hours on the first day of summer.
- surface temperature increases as the surface is exposed to the Sun's heat for longer periods of time.



Bill Nye Explains Seasons: <https://youtu.be/KUU7lyfR34o>

## Response to the Seasons

How do animals know what season it is? They don't have a calendars, jobs, or school days them figure it out.

Animals rely on the changes in the environment such as longer days and warmer days.



Animals Seasons: <https://youtu.be/fz9FvP1KRrl>

Have you seen the leaves of plants change colours? During what time of year does this happen? What causes it to happen? Plants can sense changes in the seasons. Leaves change colour and drop each autumn in some climates.



Watch this video, what do you observe?

[https://youtu.be/lmIFXIXQQ\\_E](https://youtu.be/lmIFXIXQQ_E)



Why Do Leaves Change Colour in the Fall? <https://youtu.be/Xk4-6II8I5Q>

## Leap Year

We have leap years every 4 years, but why?



[https://youtu.be/Vin\\_9fq6Nhg](https://youtu.be/Vin_9fq6Nhg)

On earth we rotate around our axis every 24 hours. ( Actually, we take 23 hours, 56 minutes and 4 seconds.)

It takes 365 days to rotate the sun so we rotate around our axis 365 times a year!



However, since we lose 3 minutes and 56 seconds everyday we need to make it up some how.

To make this up every 4 years we have a leap year (add a day to our calendar).

## 4.1 Earth's Orbit:

1. The Earth spins on a(n) \_\_\_\_\_.
2. The Earth takes \_\_\_\_\_ days to orbit the sun.
3. The Earth takes \_\_\_\_\_ hours to complete a rotation around its axis (one day).
4. We see the sun move from \_\_\_\_\_ to \_\_\_\_\_ during the day.
5. Where is the sun when it is day for us? How about night?

The arrow shows where we are.

Day	Night
	

6. When there is day in Canada, it is \_\_\_\_\_ in India.
7. A nocturnal animal is active during the \_\_\_\_\_ and asleep during \_\_\_\_\_.
8. Humans are \_\_\_\_\_ animals.
9. An owl is a(n) \_\_\_\_\_ animal.
10. Shadows are made when an object \_\_\_\_\_ light.
11. My shadow moves because the \_\_\_\_\_ is always moving.
12. People used to tell time using the sun with something called a(n) \_\_\_\_\_.
13. A \_\_\_\_\_ is half of the Earth (north and south).
14. When the South Hemisphere is tilted away from the sun, it is \_\_\_\_\_.
15. In winter, the number of hours in a day is \_\_\_\_\_.

16. What are two examples of ways animals adapt to the seasons:

17. Watch "One Year in 40 Seconds" what do you notice about the leaves on the trees?

18. Leaves are green because of a chemical called \_\_\_\_\_.

19. What day do we add to our calendar every 4 years? \_\_\_\_\_

20. It takes us exactly \_\_\_\_\_ hours \_\_\_\_\_ minutes \_\_\_\_\_ seconds to travel rotate around the Earth's axis.

21. What would happen if we got rid of leap years?

22. One year is \_\_\_\_\_ days, plus \_\_\_\_\_ hours.

23. If we have an extra 6 hours a year, how many years, would it take to make a day (24 hours)? \_\_\_\_\_