Name________________ Test Date ____ Hour__

ASTRONOMY#2 - NOTEBOOK

Planet Earth

LEARNING TARGETS

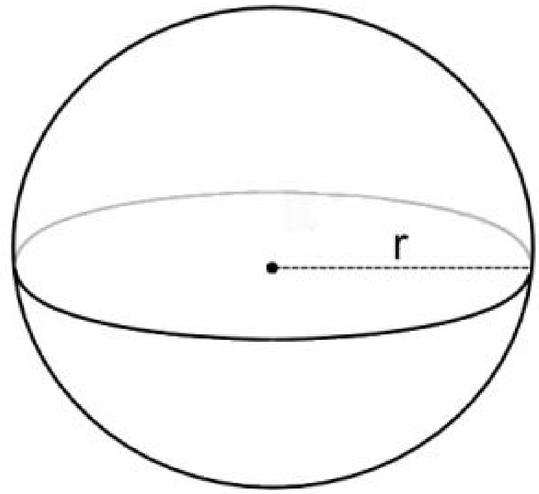
- ❑ I can describe a sphere and give evidence used to prove Earth is spherical.
- ❑ I can explain the difference between rotation and revolution.
- ❑ I can identify the time required for Earth's rotation and revolution.
- ❑ I can identify the tilt of Earth's axis and describe how it affects the planet.
- ❑ I can explain the difference between Solstices and Equinoxes.
- ❑ I can describe Earth's magnetic field and the benefits Earth receives from it.
- ❑ I can describe how the Earth's magnetic field is created.
- ❑ I can explain the difference between Earth's rotational axis and Earth's magnetic axis.
- ❑ I can describe why a magnetic compass points north.

Scientific Language

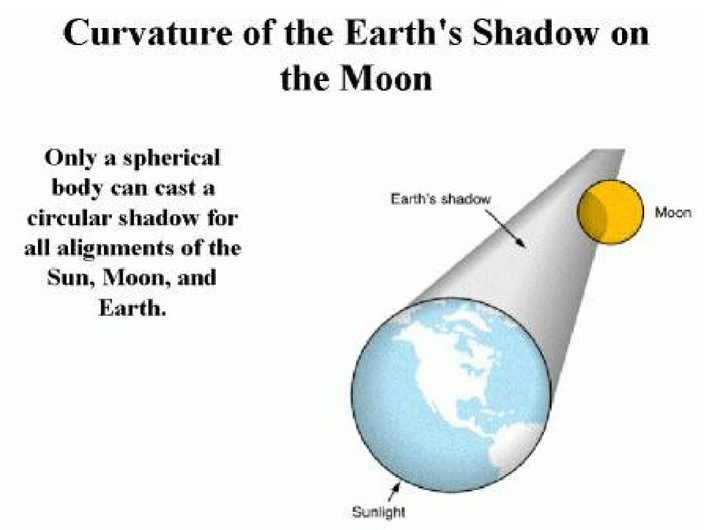
1. **Magnetic Field**– An invisible force protecting the Earth from solar radiation.
2. **Core**– Innermost layer of Earth composed of an outer liquid layer and inner solid layer of iron.
3. **Compass** – A navigational device consisting of a magnet free to swing horizontally so that it always points north.
4. **Rotation** – The spinning of Earth on its axis.
5. **Revolution** – Earth's yearly orbit around the sun.
6. **Season** – Each of the four divisions of the year (spring, summer, autumn, and winter) marked by particular weather patterns and daylight hours, resulting from the earth's changing position with regard to the sun.
7. **Equinox** – The two days during the year when the sun's most direct rays shine on the equator, creating an even 12 hours of daylight and 12 hours of night.
8. **Solstice** – The two days during the year when the sun's direct rays reach their greatest distance north or south of the equator, creating our longest or shortest days of the year.
9. **Tilt** – Earth's slant at an angle of 23.5°.
10. **Axis** – The imaginary vertical line around which Earth spins.
11. **Sphere** – A round three dimensional object having the same distance from its center to the surface at all points.
12. **Ellipse** – An elongated closed curve, similar to an oval.
13. **Hemisphere** – The northern and southern halves of the earth, separated by the equator.

Properties of Earth

Spherical Shape

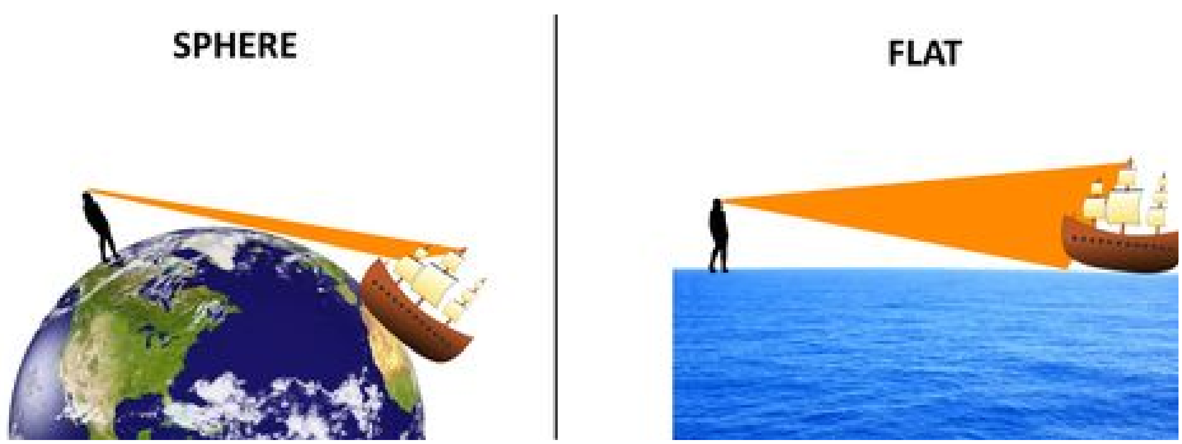


Planet Earth is a round three dimensional object called a _______________. A sphere is defined as having the same distance from its _______________ to the _______________ at all points.

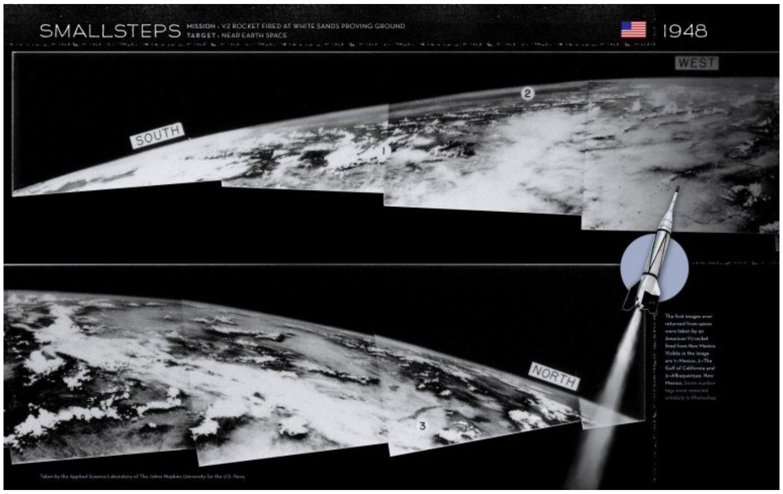


At first people thought the Earth was _______. In 350 BC, _____________, a Greek astronomer and philosopher, suspected the Earth was a _______________ based on _______________ he made during an eclipse. He noticed that the Earth cast a ____________ ____________ on the moon during the eclipse.

Observation by sailors also _______________ the belief in a spherical Earth, they observed that ships came into view a ____________ at a time instead of all at __________.

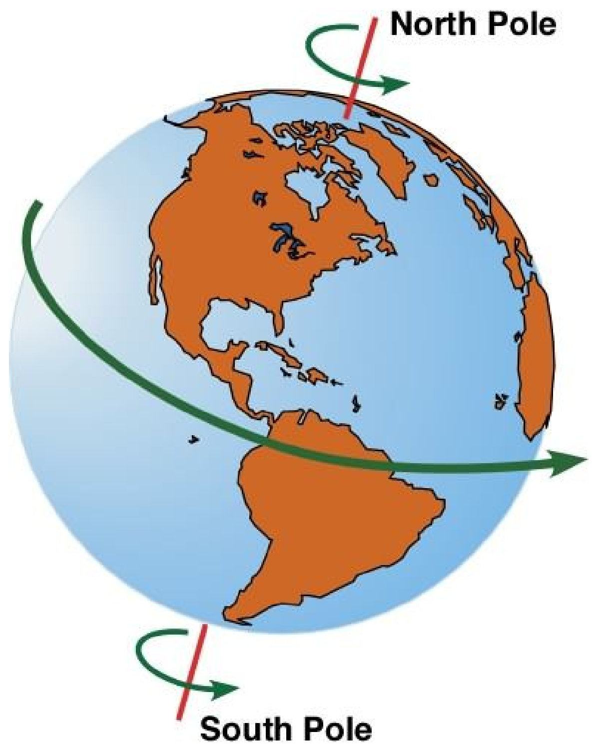


In the late 20th century, artificial _______________ and space _______________ sent back _______________ finally showing a spherical Earth. However, we now know that the Earth actually bulges slightly at the _______________ and flattens at the _________, so it is not a _______________ sphere.



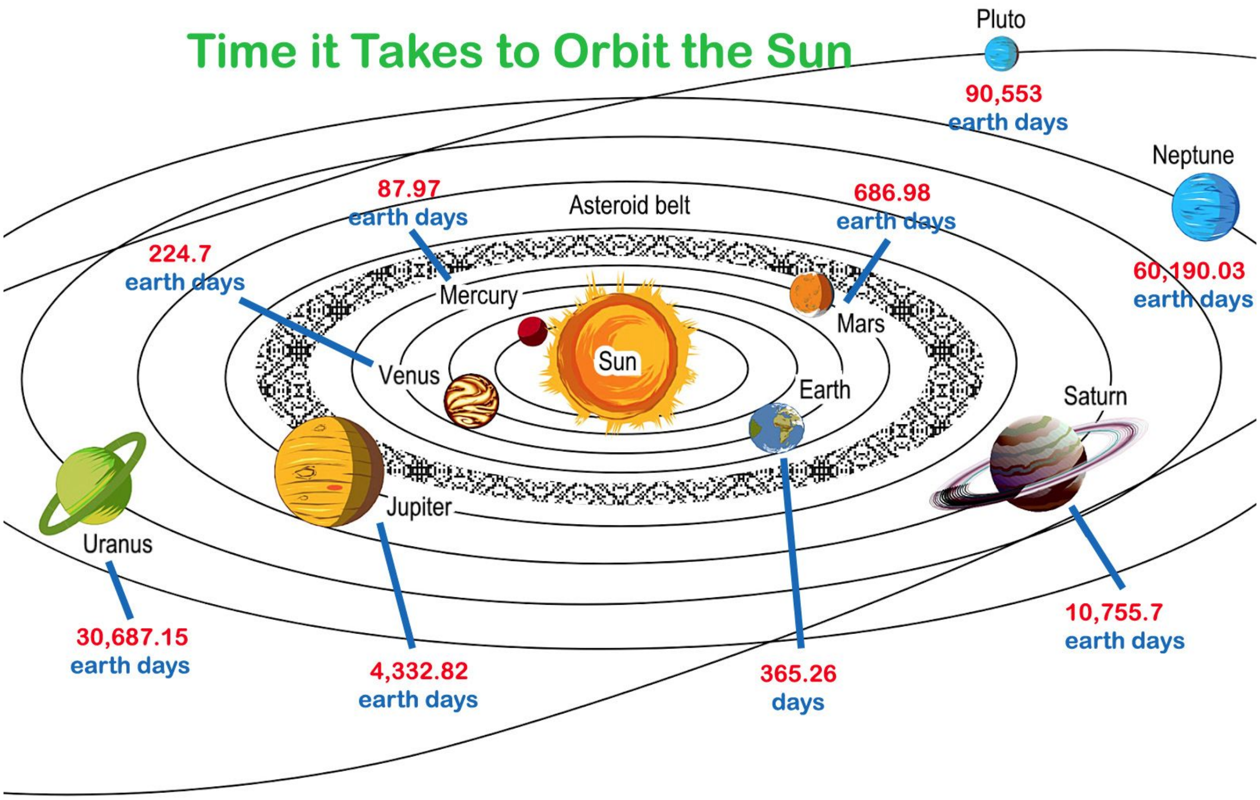
Rotation

Earth's ____________ is the imaginary vertical line around which Earth ________ . The poles are located at the ___________ and ___________ ends of Earth's axis. The spinning of Earth on its axis is called ________________. This rotation causes _________ and ___________ to occur. On Earth, the rotation takes you in and out of the view of the ________ … the sun is ________________ . One complete rotation, or _________ , takes _____ hours and ______ minutes, or 1 ________ .

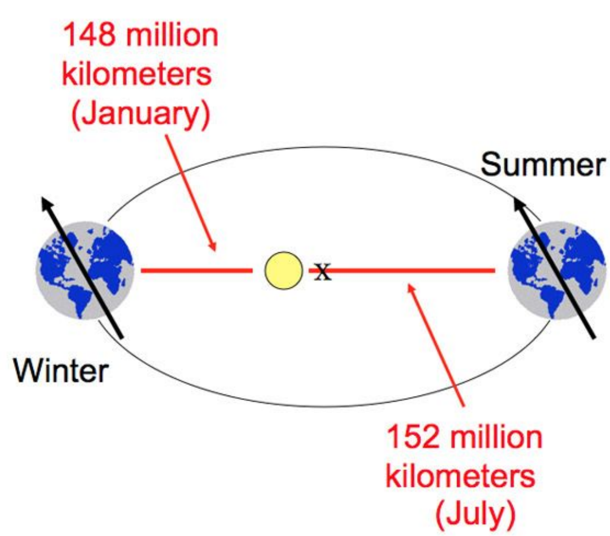


Revolution

Another important motion is _______________. Our revolution is Earth's yearly _________ around the _______. Just as the moon is Earth's satellite, Earth is a _______________ of the ______. Earth completes about 365 _______________ during its 1 ____________ revolution around the sun.

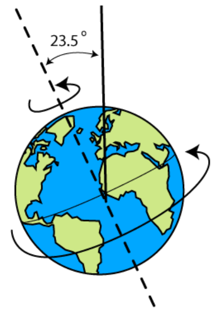


If Earth's orbit was a perfect _____________ with the sun at the center, Earth would maintain a constant ______________ from the sun. However, this is ________ the case. Earth's orbit is an ______________, an elongated closed curve, similar to an _________. Because of this the _______________ between the sun and Earth ____________ during its year long orbit. Earth is actually closest to the sun around ____________ _____ and farthest from the sun around _________ ______.



hmmmm Why is it cold when we are closest and warm when we are farthest?

The Tilt and the Seasons

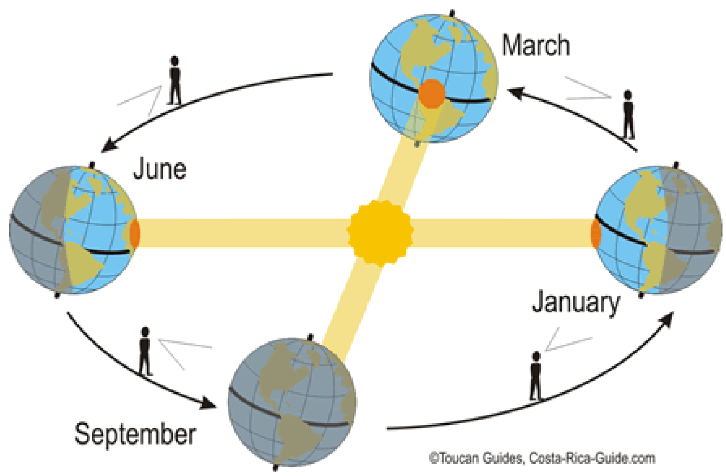


Earth's axis is tilted ______ , meaning the Earth is not ______________ up and down.

Daylight hours are ___________ for the ______________, or half of the earth, tilted ____________ the sun.

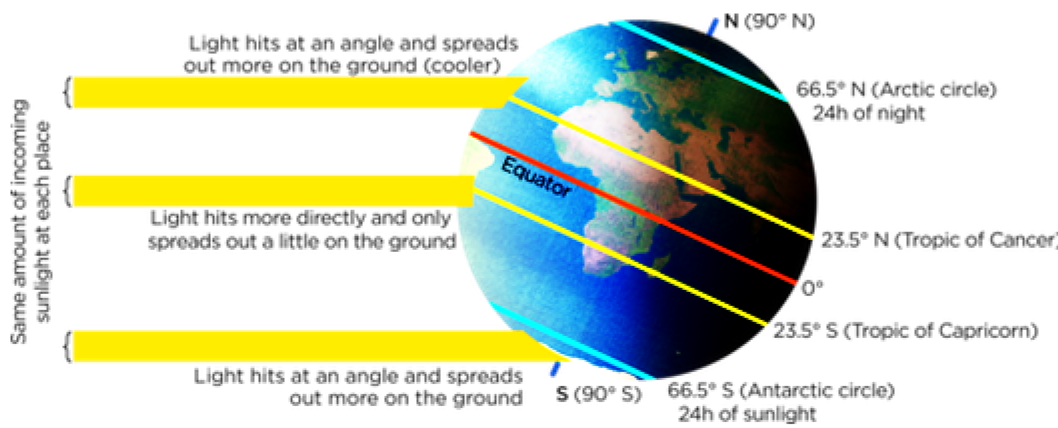
When a hemisphere is tilted towards the sun, they experience ____________.

When a hemisphere is tilted away from the sun, they experience ____________.

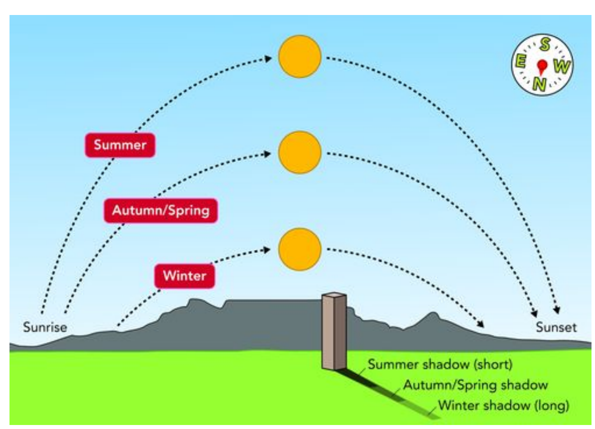


The hemisphere tilted towards the sun receives ________ hours of sunlight each day compared to the hemisphere tilted away from the sun. The ___________ period of sunlight is one reason summer is ______________ than winter.

The hemisphere tilted towards the sun also receives more ___________ rays, equalling more solar ____________ and _____________ temperatures.

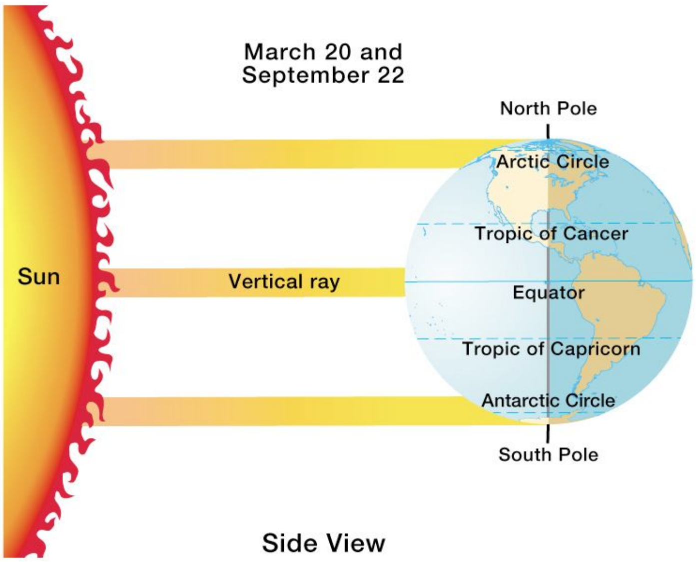


In the hemisphere tilted away from the sun, the sun appears _________ in the sky, daylight hours are ______________ and solar radiation is ______________.



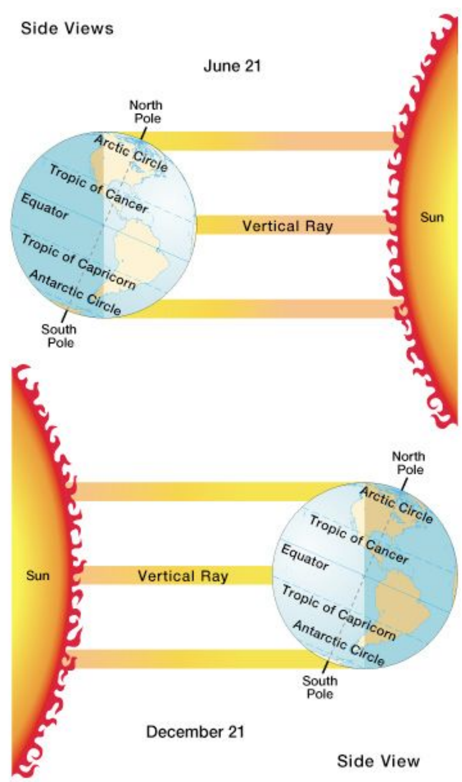
The Equinoxes and the Solstices

Due to the Earth's tilt the sun isn't directly in line with the ____________ except for _____ days out of the year, once in __________ and once in _______________. We call these days the _______________ .



On the equinoxes, the sun's most ___________ rays shine on the equator. The _______________ equinox is on March _______ or _______. The autumn equinox is on _______________ 22nd or 23rd.
On the equinoxes we have an _________ 12 hours of _______________ and 12 hours of _______________ . because neither the _______________ hemisphere nor the _______________ hemisphere is tilted towards the sun.

During the rest of the days of the year, the sun's direct rays are shining either ___________ or __________ of the equator. When sun's direct rays reach their _______________ distance from equator once in __________ and once in _______________. We call these days the _______________. The June Solstice (our _______________ solstice) is when the sun's direct rays have reached the farthest _________ of the equator. This happens on June ______ or ______.

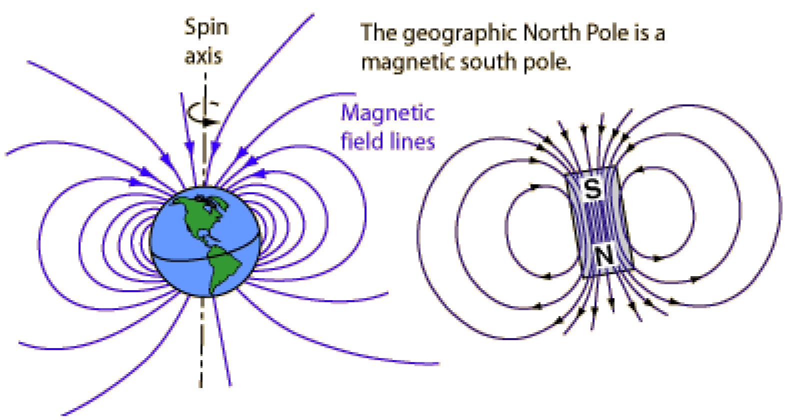


The December Solstice (our _______________ solstice) is when the sun's direct rays have reached the farthest _______________ of the equator. This happens on Dec _______ or ________. On the Solstice day we have either our _______________ or _______________ day of the year, depending on which _______________ you are in.

Physical Properties of Earth	
Diameter (pole to pole)	
Diameter (equator)	
Circumference (poles)	
Circumference (equator)	
Mass	
Average Distance to the Sun	
Period of Rotation (1 day)	
Period of Revolution (1 year)	

Earth's Magnetic Field

You can't see it, but there's an invisible _______________ field around the Earth _______________ the planet – and all the life – from space _______________ .



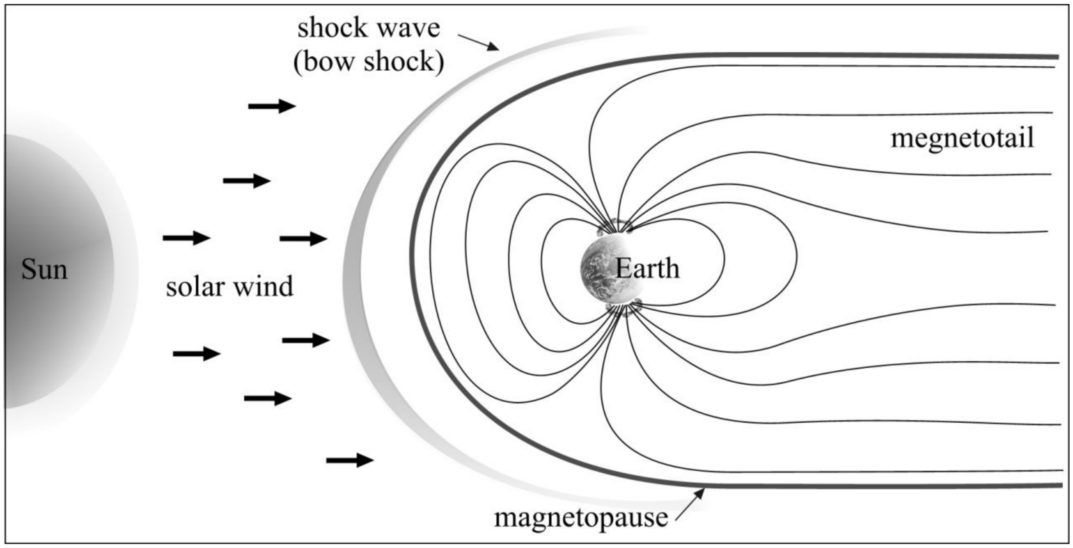
The Earth is like a great big magnet. The magnetic field is like a bar _______________ . Earth has a __________ and a __________ magnetic pole, just as a bar magnet has _______________ magnetic poles at each of its ends.

Imagine a giant bar magnet running along the _______ of Earth. Magnetic field lines extend from these poles out _______ ___ _______________ of kilometers into space and wrapping around to the _______________ pole. This is the Earth's _______________.

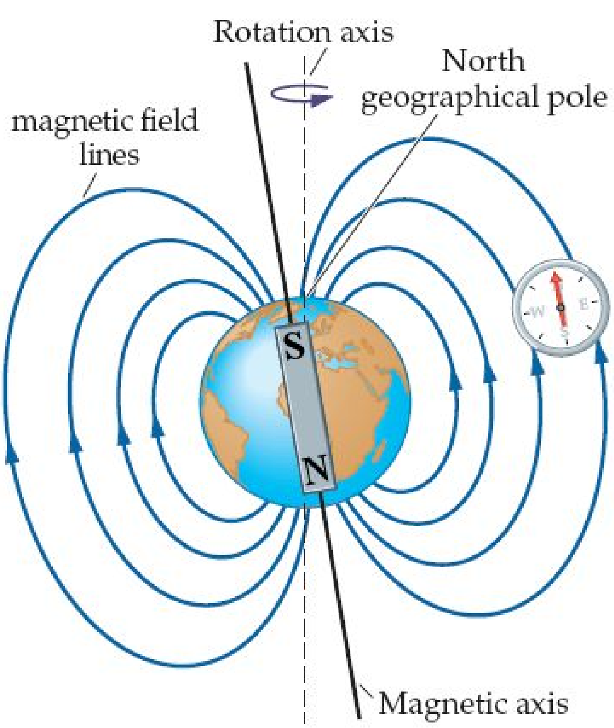
Scientists hypothesize that the movement of __________ inside Earth's core, along with Earth's _______________ , generates a _______________ field. The flow of liquid iron generates _______________ currents, which in turn produce _______________ fields.

The magnetic field of the Earth _______________ the planet from space radiation. The biggest culprit is the Sun's _________ _________. These are highly _______________ particles blasted out from the Sun like a steady wind. The Earth's magnetosphere channels the solar wind _______________ the planet, so that it doesn't _______________ us.

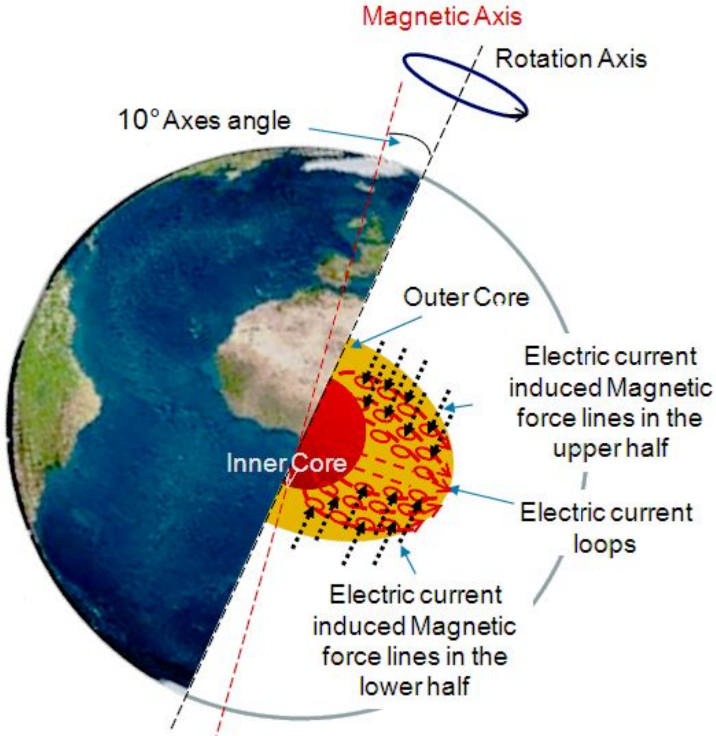
Without the magnetic field, the solar wind would strip away our _______________ – this is what probably happened to __________.



When you observe a compass needle pointing _____________, you are seeing _______________ of Earth's magnetic field. In order for the north end of the compass to _________ toward the North Pole, you have to assume that the 'buried bar magnet' has its _________ end at the _________ Pole. If you think of the world this way, then you can see the normal "_____________ ____________" rule of magnets is working.



Earth's ______________ axis does not align with its _______________ axis. The magnetic axis is tilted at an angle of ______ to the rotational axis. If you followed a compass needle, you would end up at the _______________ north pole rather than the ________________ north pole. The magnetic poles have _______________ throughout the Earth's history wandering as much as _____ km every year.



The Earth's annual orbit around the Sun. (Not to Scale)