

Lunar Landing Items

Matches 1 box	Food concentrate mix with water to make food	Nylon rope 50 feet long
Parachute	Portable heater battery operated	Handgun .45 caliber
Dehydrated milk 1 case, mix with water to make milk	Oxygen 2 tanks, 100 pounds each	Moon map shows positions of groups of stars to help people find their way around the moon
Life raft self-inflating, comes with a high pressure CO ₂ cartridge (containing carbon dioxide) to inflate it	Compass magnetic	Water 5 gallons
Flares self-lighting	First aid kit includes vitamins and medicines that can be given using a special hypodermic needle that inserts into a space suit	Communication device solar powered

Copyright © Foundation of the American Board of Test Advocates

Name: _____

Date: _____

Lunar Landing Scoring Sheet

Instructions

- Record your rankings in the first column by placing the number 1 by the most important item, the number 2 by the second most important, and so on through number 15, the least important.
- Record your group's rankings in the same way in the second column.
- Record the expert rankings in the third column.
- Find your error points by calculating the difference between your ranking and the expert ranking for each item. Subtract the smaller number from the larger number and write the difference in column four. When finished, add all your error points and write the result at the bottom of the column.
- To find your group's error points, calculate the difference between the group ranking and the expert ranking for each item. Subtract the smaller number from the larger number and write the difference in column five. Add all the group error points and record the total at the bottom of the column. The smaller the score, the better you or your group did at matching wits with NASA's experts.

Item	Your Ranking	Group Ranking	Expert Ranking	Your Error Points	Group Error Points
Matches					
Food concentrate					
Nylon rope					
Parachute					
Portable heater					
Handgun					
Dehydrated milk					
Oxygen					
Moon map					
Life raft					
Compass					
Water					
Flares					
First aid kit					
Communication device					
Totals					

Copyright © Foundation of the American Board of Test Advocates

Notes - Earth, Moon & Sun

Day and Night

Earth's _____ causes day and night.

Earth rotates on a tilted _____: an imaginary _____ running through the middle of it.

Earth _____ on its axis once every _____, which is _____ day.

At any given time, half of Earth is in _____, the other in _____.

Earth's Orbit

Earth moves around the _____.

This is called a _____. Earth completes one revolution every year (_____ days).

Earth's _____ around the Sun is called is _____.

The shape of Earth's orbit is a stretched oval, called an _____.

Seasons

Earth's tilted _____ causes the _____.

Earth's axis is tilted at an angle of _____.

Earth's axis always points in the _____ direction as it moves around the _____.

The tilt affects how much _____ each _____ gets.

Summer - Northern Hemisphere points _____ the Sun = most _____ sunlight.

Winter - Northern Hemisphere points _____ from the Sun = _____ direct sunlight.

Spring - Northern and Southern Hemispheres receive _____ sunlight = days growing _____.

Fall - N. and S. Hemispheres receive _____ sunlight = days growing _____.

NAME: _____
Reading Comprehension - Unit E Chapter 2.1 (pgs. E43-E49)

Vocabulary

Axis of Rotation -

Revolution -

Season -

Equinox -

Solstice -

Reading Questions

1. What causes day and night?
2. What happens to Earth's axis of rotation as Earth orbits the Sun?
3. How do the areas of sunlight in the two hemispheres change over the year?
4. If you wanted to enjoy longer periods of daylight in the summertime, would you head closer to the equator or farther from it? Why?
5. How do the average temperatures and the seasonal changes at the equator differ from those at the poles?

Bill Nye: Earth's Seasons

1. Earth's _____ affect everything on Earth.

Why do we have seasons on Earth?

3. When Earth is towards the sun it's _____. When Earth is away from the sun it's _____. When Earth is tilted toward the sun, it's _____. Tilted away it is _____.

4. What angle is the Earth tilted on it's axis?

5. It's hot in the summer because we get sunlight _____. It's cold in the winter because we get sunlight at an _____.

6. What device did Bill use to show that the Earth is turning on it's axis?

7. During the _____ season Alaska only gets a couple of hours of darkness a day.

8. How long does the Earth take to go around the sun?

9. The _____ staying pointed the same way in space is the reason for the seasons.

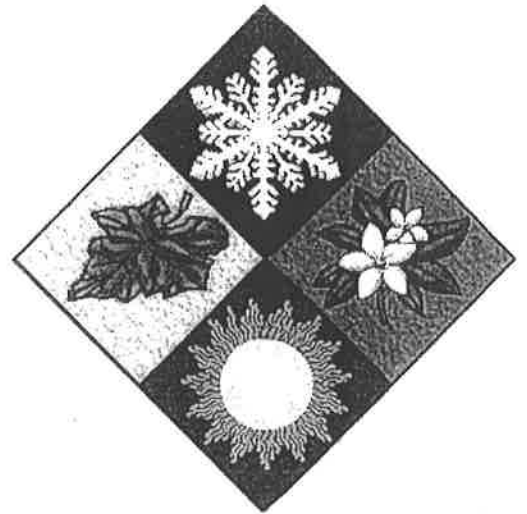
10. The _____ on a sundial goes the same direction as the hands on a clock.

11. What do June 21 and December 21 have in common?

12. When are days and nights the same length all over the world? What are the dates for these?

13. The _____ of the sun in the sky changes from day to day and month to month.

_____ Earth is why we have seasons.



Elaborate: Rotation and Revolution on a Planetary Scale
Frayser Model Student Sheet 1, 1-8 Adapted from A Schema for Testing the Level of Cognitive Mastery, WI: Wisconsin Center for Education Research

Elaborate: Rotation and Revolution on a Planetary Scale
Frayser Model Student Sheet 1, 1-8 Adapted from A Schema for Testing the Level of Cognitive Mastery, WI: Wisconsin Center for Education Research

<p>What is it? (Include a Diagram)</p>	<p>What is it not?</p>
<p>Revolution</p>	
<p>Astronomical effects related to this motion with diagrams</p>	<p>Examples</p>

<p>What is it? (Include a Diagram)</p>	<p>What is it not?</p>
<p>Rotation</p>	
<p>Astronomical effects related to this motion with diagrams</p>	<p>Examples</p>

Complete these analogies.

1. Rotation is to revolution as _____ is to _____.
2. Revolution is to a race car as rotation is to a _____.
3. Rotation is to day as _____ is to _____.
4. Spinning is to _____ as _____ is to revolution.
5. Day is to _____ as year is to _____.

Now write 3 analogies of your own that show your understanding of the terms rotation and revolution.

axis: an imaginary straight line running through Earth from pole to pole and around which Earth rotates

circumference: the distance around a circle or a sphere

plane: in mathematics, a flat, two-dimensional surface

ecliptic: the path taken by the sun and planets through Earth's sky

precession: the slow circling of the axis of a rotating body

Solar days are 24 hours, but a sidereal (sī dear ē əl) day is four minutes shorter. A sidereal day is based on the amount of time Earth needs to complete one rotation in relation to the stars, not the sun. Solar days are four minutes longer because Earth has to rotate a tiny bit farther in order for the same spot to be facing the sun again. This is because Earth moved along its orbit as it spun.

How quickly does Earth travel around the sun?

Earth is always in motion. Every day, it completes one rotation on its **axis**. You are always moving with Earth. Depending on where you live, it carries you along at different speeds.

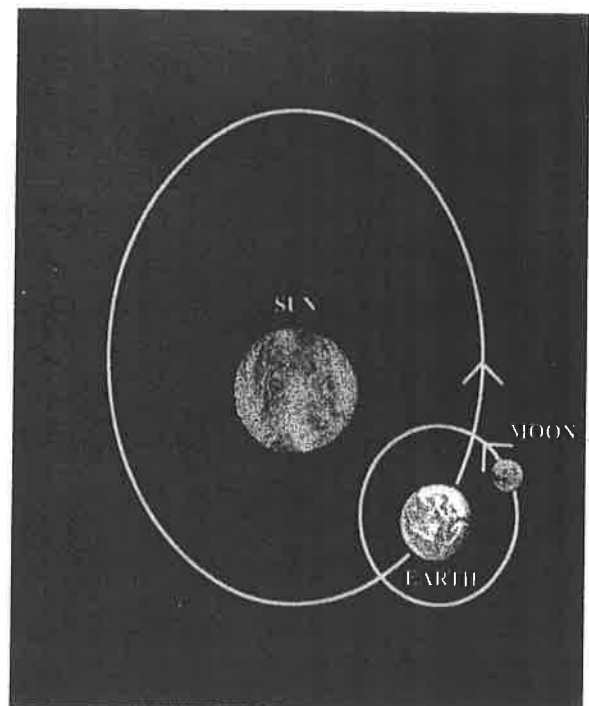
Earth's spherical shape means that someone at the equator moves much more quickly than someone standing near the poles. Earth's **circumference** is about 25,000 miles at the equator. In 24 hours—the time it takes Earth to make one rotation—you travel that entire distance. The closer someone stands to the poles, though, the less distance they will travel in 24 hours, which means they are moving more slowly than someone at the equator.

Of course, Earth doesn't just spin in place. It also orbits the sun once every year. Earth zooms along at 67,000 miles per hour in order to make its 580-million-mile journey around the sun in 365 days.

Like the other planets' orbits, the path of Earth's orbit is shaped almost like a circle. All of the planets move around the sun on nearly the same **plane**, the plane of the **ecliptic**. It's like an imaginary flat disk surrounding the sun, similar to the rings of Saturn.

Earth's axis doesn't stand upright in relation to the sun. It tilts, or leans, about 23 degrees from being vertical. This tilt causes the seasons. When Earth is on one side of the sun, the tilt places the southern hemisphere closer to the sun's warmth. The bottom half of the planet experiences summer, while the top half goes through winter. When Earth reaches the other side of the sun, the tilt doesn't change, but the top half of the planet is now closer to the sun. The northern hemisphere gets its summer, while the southern hemisphere cools down.

Earth's spin isn't perfect. It wobbles just a bit, like a spinning top beginning to slow down. If you looked down at the North Pole from space, you would see—over a period of thousands of years—that the axis slowly moves clockwise in a circle. Right now, the axis points toward Polaris, or the North Star. During the next 26,000 years, the axis will trace a circle in the sky as it points to different spots before pointing at Polaris again. This wobble is called **precession**.



Circle the letter of the best answer to each question below.

1. Earth's axis is
 - a. the imaginary line running through the poles.
 - b. the path of Earth's orbit around the sun.
 - c. the rotation Earth makes each day.
 - d. the angle it tilts away from the sun.

2. Precession describes
 - a. how Earth travels around the sun.
 - b. Earth's wobble as it spins on its axis.
 - c. the way Earth's axis tilts to create the seasons.
 - d. how the planets orbit the sun.

3. Earth's circumference is greatest
 - a. at the equator.
 - b. at the South Pole.
 - c. at the North Pole.
 - d. Both b and c

4. All the planets in our solar system circle the sun in nearly the same
 - a. orbit.
 - b. plane.
 - c. speed.
 - d. rotation.

Write your answer on the lines below.

5. Explain how Earth's movement around the sun creates the seasons.

Name: _____ Date: _____ Pd. _____

Webquest: Rotation & Revolution

<http://www.exploratorium.edu/ronh/age/>

Fill out the table below.

Planet	Age in Days	Age in Years	Next Birthday
Mercury			
Venus			
Earth			
Mars			
Jupiter			
Saturn			
Uranus			
Neptune			
Pluto			

What is the difference between a rotation and a revolution?

Planet	Rotation Period	Revolution Period

What was Johannes Kepler's contribution to astronomy?

Who was Tycho Brahe?

What did Sir Isaac Newton contribute to astronomy?

Planet/Moon/Star Name	Weight
Mercury	
Io	
Sun	

What is the difference between weight and mass?

Go to my Blackboard site. Click the "6th Grade" Tab. Under today's homework assignment click the powerpoint on Rotation and Revolution and answer the following questions:

1. What 2 things cause the seasons?
2. How do we know that Earth rotates?
3. Name some other things or objects that rotate.
4. What causes day and night?

Test your space knowledge with these fun games!

Space Walk: http://funschool.kaboose.com/globe-rider/space/games/game_space_walk.html

Planet Pursuit: http://funschool.kaboose.com/globe-rider/space/games/game_planet_pursuit.html

Space Defenders: http://funschool.kaboose.com/globe-rider/space/games/game_space_defenders.html

Space Patrol: http://funschool.kaboose.com/globe-rider/space/games/game_space_patrol.html