Chapter 21 General Science

Planet Earth

21-1 Spaceship Earth

**solar system**- the sun and all the planets and other objects that circle around it

**orbit**- a closed, curved path

\* Compare the photo of Earth to a map of Earth. Can you recognize any landforms or bodies of water? Describe. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\* The word *equator* comes from the Latin word *aequator,* which means “ones who make equal.” Why is this name fitting? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\* The word *solar* means “sun.” The solar system is the system of planets revolving around the sun.

\* In 1543, the Polish astronomer Nicholas Copernicus published his theory that the Earth and all the other planets revolve around the sun. Until then, people believed that everything in the sky revolved around the sun.

\* It takes approximately 365 days for the Earth to make one full rotation around the sun. We have a leap year (an extra day) every 4 years to make up for this.

\* Earth is a planet among many others in the **solar system**. Here are the other planets. Here they are in order, starting closest to the sun.

1.) Mercury

2.) Venus

3.) Earth

4.) Mars

5.) Jupiter

6.) Saturn

7.) Uranus

8.) Neptune

9.) Pluto (no longer considered a planet).

\* The Earth moves around its own closed, curved path around the sun. This is called an **orbit**.

\* Earth stays in orbit because of the strong pull of gravity from the sun. This pull keeps all the planets and objects of the solar system in their own orbits.

\* Most scientists think that the Earth was formed about 4.5 billion years ago. They think that the Earth started as a huge cloud of gas and dust.

\* Over time, gravity drew the gas and dust particles together. Over time, they formed the planets and the sun.

\* The surface water on the Earth probably appeared about 3.9 billion years ago.

\* Gravity is a force of attraction between any two objects that have mass.

21-2 Features of the Earth

**continent**- a large landmass

**equator**- an imaginary line that circles halfway between the North and South poles

**core**- the layer at the center of the Earth

**mantle**- the middle layer of the Earth

**crust**- the outer layer of the Earth

**axis-** an imaginary line that runs from one pole, through the center of the Earth, to the other pole

\* There are four oceans on Earth. These are:

1.) The Pacific Ocean

2.) The Atlantic Ocean

3.) The Arctic Ocean

4.) The Indian Ocean

\* The color of ocean water varies from dark gray to blue and green. The color is caused partly because of microscopic organisms near the surface.

\* Other causes of ocean color include minerals and impurities in the water. Also, the water scatters sunlight, producing a bluish color. Finally, the water reflects the color of the sky.

\* Some maps show a 5th ocean, the Antarctic Ocean. However, this body of water is really just a cold current flowing around Antarctica.

\* About 70% of the Earth is covered with water.

\* Water covers so much of our planet that it is sometimes called “the water planet.”

\* All of the oceans are made of salt water. They are all connected.

\* Earth also has rivers, streams, lakes, ponds, and large masses of ice on Earth. These are mostly made of fresh water.

\* The Earth has seven **continents**. They are:

1.) Africa

2.) Antarctica

3.) Asia

4.) Australia

5.) Europe

6.) North America

7.) South America

\* Mountains, plains, deserts, and islands are found on or near the surface of the continents.

\* The highest point on Earth is the top of Mount Everest. The mountain rises to a height of 29.028 feet above sea level. It is located between Nepal and Tibet in Asia.

\* The lowest point of land on Earth’s surface is the shore of the Dead Sea. It is 1,310 feet below sea level.

\* The northernmost part of the Earth is called the *North Pole*. The southernmost part is called the *South Pole*.

\* The **equator** is halfway between the North and South poles.

\* The Earth is shaped like a ball. This ball shape is called a *sphere*. It is slightly squashed at the poles, and it bulges at the equator.

\* The *diameter* is a straight line drawn through the center of a circle or sphere. The Earth’s diameter at the equator is 7,926 miles. The diameter of the Earth from pole to pole is 7,899 miles.

\* The Earth has three layers. There is the **core**. Scientists think that the inner part of the core is made of solid nickel and iron. The outer part is probably nickel and iron also, but in a liquid form.

\* The Earth’s core is very, very hot. In fact, it gets to 7,232 degrees Farenheit.

\* The middle layer is called the **mantle**. It is made up of approximately 1,700 miles of solid rock. The mantle is made of silicon, oxygen, aluminum, iron, and magnesium.

\* The outer layer is the **crust**. It is very thin. It is between 4-25 miles thick. The continents and the ocean floor are part of the Earth’s crust, which is like a hard shell around the mantle.

\* The Earth moves in two ways.

1.) It orbits the sun. It takes 365 ¼ days to revolve around the sun.

2.) It spins on its **axis**. It takes 24 hours to make one complete turn.

\* The spinning of the Earth causes the cycle of day and night. Areas facing the sun have daylight.

\* The Earth spins on its axis from west to east. This explains why the sun appears to rise in the east to set in the west.

\* The Earth is always tilted the same way as it revolves around the sun. This causes varying lengths of day and night throughout the year.

\* If the Earth’s axis were straight up and down, all parts of Earth would have 12 hours of daylight and 12 hours of night every day of the year.

\* The Earth spins on its axis from east to west. This explains why the sun appears to rise in the east and set in the west.

\* The four seasons result because the Earth is tilted on its axis.

\* While one hemisphere is tilted towards the sun, the other is tilted away. As the Earth orbits the sun, the direction of the tilt changes. The number of daylight hours also changes. These differences cause the change of season.

\* In winter, the hemisphere is tilted away from the sun. This is because the sun’s rays strikes the Earth at more of an angle. There are fewer hours of daylight. It is summer in the hemisphere tilted towards the sun. Here the sun’s rays strike the Earth at less of an angle. There are also more hours of daylight.

\* In the Northern Hemisphere, on the first day of summer (summer solstice), the sun is directly overhead at the Tropic of Cancer.

\* On the first day of winter (winter solstice), the sun is directly overhead at the Tropic of Capricorn.

\* On the first day of spring (vernal equinox) and the first day of fall (autumnal equinox), the sun is overhead at the equator.

21-3 Dividing Up the Earth

**globe**- a sphere, or ball, that has a map of the Earth on its surface

**line of latitude**- a line that circles a globe; runs east to west

**line of longitude**- a line that circles a globe; runs north to south

**prime meridian-** the 0-degree line of longitude

\* We have a mini-representation of the Earth called a globe. Lines run through them from east to west and north to south. These lines help people find different places and features on Earth.

\* Why is a globe a better representation than a flat map? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\* Lines that run east to west are called **lines of latitude**. The equator is a line of latitude.

\* Lines that runs north to south are called **lines of longitude**.

\* I always try and remember “flat-itude” and “long-itude”.

\* Lines of latitude and longitude are assigned numbers called *degrees*.

\* Latitude measures north and south of the equator.

\* Degrees of latitude and longitude are about 69 miles apart from the next line.

\* The 0-degree line of longitude is called the **prime meridian**. It runs through Greenwich, England.

\* There are 24 time zones that have been set up around the world. A time zone is an area in which the same time is used. Each zone covers about 15 degrees of longitude. 24 x 15 = 360…there are 360 degrees in a circle.

\* The boundary lines are not always straight lines. They are drawn so most states and small countries fit into one time zone.

\* Most of the U.S. is divided into four time zones. These are called:

1.) Pacific

2.) Mountain

3.) Central

4.) Eastern

\* Alaska and Hawaii are west of the Pacific zone, so they fall into different time zones.

\* Each time zone is on hour different from the ones on either side. If you travel east, you lose one hour as you cross into each time zone. Going west, you gain an hour as you cross into each new time zone.

\*\*\*We will now complete a planet Webquest using the following link.

<http://olc.spsd.sk.ca/de/webquests/planetwq/webquest2.html>

When your group finished the project, here are some more on-line activities.

Try this online worksheet/activity at the following site.

<http://www.planetsforkids.org/planet-earth.html>

Check out this site for games about other planets.

<http://www.nasa.gov/audience/forkids/kidsclub/flash/index.html>

Here is another cool website that we will use.

<http://spaceplace.nasa.gov>

How old will you be when your Gameboy batteries die?

<http://spaceplace.nasa.gov/batteries/>

Color pages on the computer or hardcopy. Use the link below.

<http://spaceplace.nasa.gov/coloring-book/en/#>

Try some games at the following site.

<http://spaceplace.nasa.gov/menu/play/>