**Science Study Guide**

**Unit 3: Earth & Space**

***Please study each night so you are prepared for the test. Let me know if you have any questions.***

**VOCABULARY:**

**Rotate**-to turn about on an axis; to spin or turn like a top

**Revolve**- to orbit around an object

**Axis**-the imaginary line around which the Earth rotates

**Orbit**-the path that an object takes around another object in space

**Moon phase**-a change in the appearance of the moon’s shape as it orbits Earth

**Waxing**-to have a progressively larger part of the moon’s visible surface illuminated; the moon appears to be growing during this phase

**Waning**-to have a progressively smaller part of the moon’s visible surface illuminated; the moon appears to be getting smaller during this phase

**Solar system**-a star and all the planets and other bodies that revolve around it

**Planet**-a large, round body that revolves around a star in a clear orbit

**Astronomy**-the study of objects in space and their properties

**Stars**-huge balls of very hot, glowing gases in space that produce their own light and heat

**Constellation**-a pattern of stars that form an imaginary picture or design in the sky

**Galaxy**-a group containing billions of stars, objects that orbit those stars, gas and dust

**Universe**-everything that exists

**Satellite**-an object in space that orbits or circles around a bigger object; the moon is a natural satellite that orbits Earth

**Sun**-a star made up of burning gas

**EARTH AND MOON**

* The Earth **revolves** around the sun. One revolution takes **365¼ days**.
* The Earth **rotates** every **24 hours** on its axis. This rotation causes day and night.
* Earth rotates on its **tilted axis**. As it revolves around the sun, the direction of its tilted axis does not change.
* The **tilt of Earth’s axis causes the seasons**.
  + When the Northern Hemisphere is tilted away from the sun, that part of the Earth has winter.
  + When the Northern Hemisphere is tilted toward the sun, it has summer.
* The **tilt also causes a change in the amount of daylight and darkness** per day.
  + When the Northern Hemisphere is tilted toward the sun in summer, more of it is lit so there will be more daylight hours.
  + People living in the Arctic Circle get 24 hours of sunlight during the summer months because it is tilted completely towards the sun; at the same time, the Antarctic Circle is in complete darkness 24 hours a day.
  + In most places on Earth, the number of daylight hours changes with the seasons.
* The moon is Earth’s satellite; it revolves around the Earth.
* We see only one side of the moon from Earth because the moon takes the same amount of time to rotate once as it does to orbit Earth once.
* The moon has no air, wind, or liquid water.
* The moon does not have light—we see the moon because light from the sun reflects from it and back to Earth.
* The moon’s shape does not change. The changes in the appearance of the moon’s shape are known as moon phases.
* It takes about one month for the moon to move through all of its phases:
  + New Moon (looks like it is not there)
  + Waxing Crescent (sliver of moon is illuminated on right)
  + First (1st) Quarter (half lit, half dark on right side)
  + Waxing Gibbous (3/4 lit on right))
  + Full Moon (totally lit)
  + Waning Gibbous (3/4 lit on left)
  + Last (3rd) Quarter (half lit, half dark on left side)
  + Waning Crescent (sliver is illuminated on left)

**SPACE AND PLANETS**

* Each planet rotates at a different rate so the length of a day is different for each.
* Order of the planets from the sun:
  + Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
  + “***M****y* ***V****ery* ***E****ducated* ***M****other* ***J****ust* ***S****erved* ***U****s* ***N****oodles!”*
* Inner Planets
  + Have hard, rocky surface with large, solid cores
  + Are closest to the sun so they are the warmest
  + Smaller in size
  + Have no more than two moons
  + Revolve around the sun more quickly than the outer planets
  + The only planets where probes from Earth have landed
* Outer Planets
  + Giant balls of gases with small, solid cores
  + Are on the far side of the asteroid belt
  + Enormous in size and less dense than the inner planets
  + Have many moons
  + Rotate quickly (which makes for a short day) but take a long time to revolve once around the sun
  + Surrounded by rings made of dust, ice, or rock
* All planets rotate and orbit the sun.
* Stars are huge balls of hot, glowing gases
* Stars are classified by color, temperature, brightness, and size
  + A star’s color indicates its temperature; blue stars are the hottest
  + Wide range of sizes
  + Brightness is related to the amount of light it gives off
* Sun is the largest object in our solar system
  + Made of up a burning gas
  + Medium-sized yellow star
  + Sun seems larger than other stars only because it is closer to Earth
  + Many stars are larger or hotter than the sun; Supergiants can be more than 100 times the size of the sun
* Stars make their own heat and light
* Planets reflect light and do not make their own heat
* Planets constantly move in orbit
* Inner planets are Earth’s closest neighbors and sometimes look like bright stars
* Technological advances make it possible for us to learn about what happens in the night sky and to see deeper into space: *telescopes, satellites, deep-space probes, space stations, rockets, rovers, and computers*