Science District Midterm REVIEW Answers

Scientific Method

- **Observation**: gathering scientific information through the senses
- **Hypothesis**: a question that defines the relationship between 2 variables
- **Control**: experimental group that does not require the independent variable
- **Independent variable**: the variable that you change
- **Dependent variable**: the variable that you measure
- **Constants**: variables that stay the same in an experiment

Review Questions

a. Amount of water each sponge absorbs
b. Different brands of sponges
c. Bucket, water (in the bucket), time (1 min)

Earth in Space

- Orbit: curved path followed by space object as it revolves around another space object
- Revolve: the movement of an object around another object -- 365.25 days
- Rotate: the turning of an object on its central axis
- Moon: natural satellite revolving around a planet
- Axis: imaginary line running through the center of the Earth from the North
- Direct rays: light rays that hit the Earth directly (e.g. at the equator)
- Indirect rays: light rays that hit the Earth at an angle
- Day-Night Cycle: cycle caused by the Earth's rotation once on its axis
- Solar Eclipse: Moon is between the Earth and Sun casting a shadow on Earth
- Lunar Eclipse: Earth is between the Sun and Moon causing its shadow to fall on the Moon

Review Questions

a. 24 hours / 1 day
b. Your shadow changes length and direction throughout the day. As the sun's position in the sky changes from East to West, the length and direction of shadows change in the opposite direction, West to East)
    i. Morning - long shadow
    ii. Noon - shortest shadow

iii. Afternoon - longest shadow

c. Earth's revolution

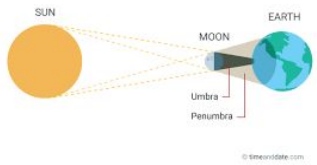
d. The tilt of Earth's axis and Earth's revolution

e. 8 phases of the moon

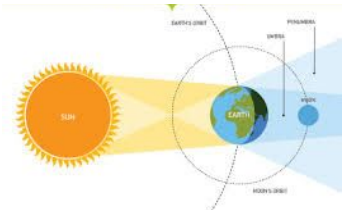
f. We see different phases of the moon as a result of our position on Earth, and the changes in the angle of the sun's rays as they reflect on the Moon.

g. Extreme tides (spring tides) occur during either a New Moon or Full Moon. Extreme tides occur as a result of the gravitational pull of the Sun and Moon on the Earth's oceans. The strong gravitational pull of the Moon produces a tidal bulge on one side of the Earth.

h. Solar Eclipse Diagram: occurs during a New Moon.



i. Lunar Eclipse Diagram: occurs during a Full Moon.



j. The moon's orbit is tilted and is therefore not always aligned with the Earth's orbit.

Exploring the Solar System

- **Gravitational Force**: force of attraction between 2 objects that have mass
- **Piloted Mission**: mission involving technology piloted by human beings
- **Unpiloted Mission**: mission where the technology is controlled remotely
- **Spacecrafts**: equipment used to travel through solar space
- **Remote sensing**: process used to gather information from space on things that we are unable to see or touch
- **Planet**: large spherical object orbiting a star
- **Star**: celestial body made of hot gases in which nuclear fusion occurs
- **Moon**: natural satellite orbiting a planet
- **Solar system**: the collection of eight planets and their moons in orbit around the sun, together with smaller bodies in the form of asteroids, meteoroids, and comets

Review Questions

a. As mass increases, gravitational force increases
b. As distance increases, gravitational force decreases
c. Remote sensing can be used for:
d. Gravitational pull exists as long as there are objects with mass.
e. Planets need to keep moving in orbit to avoid collisions with other planets or space objects or being sucked into the Sun's center.
f. Planet: Mars

Energy

- **Potential Energy**: stored energy
- **Kinetic Energy**: energy in motion
- **Conserving Energy**: reducing or saving the total energy transformed
- **Energy Transfer**: movement of energy from one object to another
- **Energy Transformation**: transfer of energy from one type to another
- **Temperature**: average temperature per molecule
- **Conductor**: material that easily allows the flow of energy
- **Insulator**: material that restricts or slows down the flow of energy

Review Questions

a. **Law of Conservation of Energy states that energy cannot be created or destroyed but instead is transformed or transferred.**
b. **Turning off lights when not in use, energy efficient appliances etc.**
c. **See the table in Activity 58 (page D-31)**
d. **Point B. Cart is on the highest hill.**
e. **Point C. Cart has come off the hill with the most (gravitational) potential energy**

f. Computer Energy flow diagram:

Chemical (battery) >>>>Electrical>>>> light, thermal, sound