Riverton Street Charter School Name: _____
Class:_____ Date: _____

STATE EXAM REVIEW PACKET

Unit One- Science and Inquiry

Science is a way of learning about the natural world by gathering information. Science includes all of the knowledge gained by exploring nature. To think and work like a scientist, you need to use some of the skills that they do. Scientists use the skills of observing, inferring, and predicting to learn about the natural world.

Vocabulary:

Scientific Method:

Hypothesis:

Observing:

Inference:

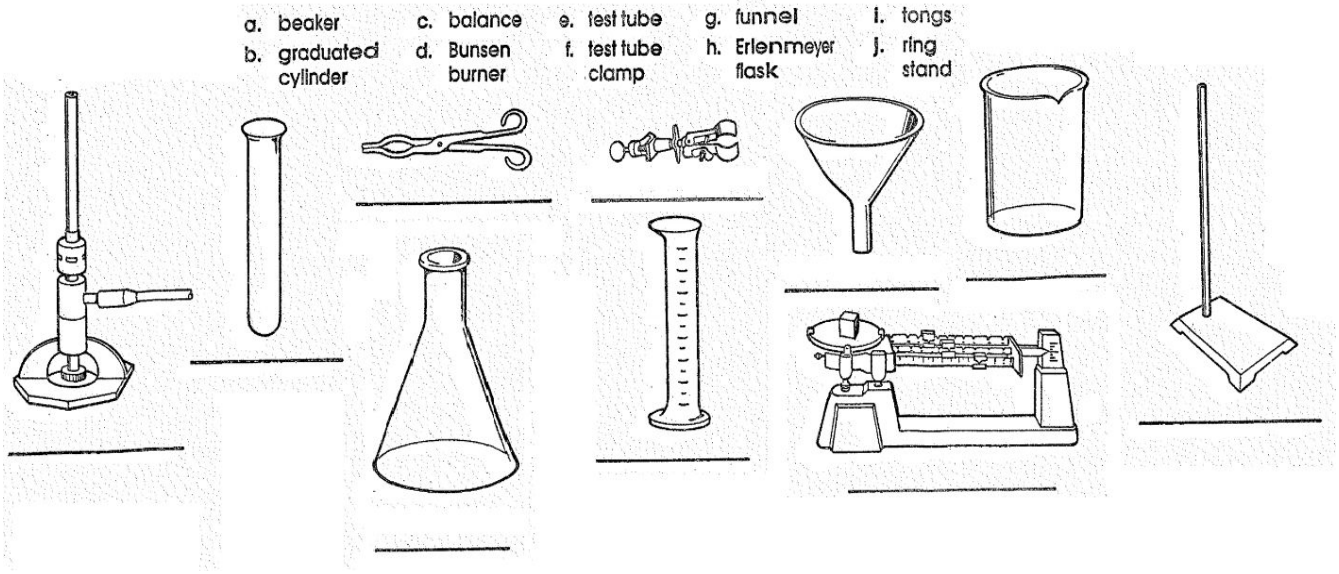
Independent variable:

Constant:

Dependent Variable:

Lab Safety:

What are some of the most important safety rules in a science classroom?



Review Questions:

1. A group of science students have been learning how the human circulatory system reacts during exercise. The students measured their heart rates both before and after they ran five laps around the school gym. This was repeated two more times, with a 5-minute rest period between each trial. The average heart rates of the students are shown in the bar graph. Use the data from the bar graph to complete the data table below.

Data Table

Trial	Heart Rate Before Exercise (beats per minute)	Heart Rate After Exercise (beats per minute)
1		
2		
3		

2. A farmer grows and sells flowering plants. The best-selling plants are the ones with the most blossoms. The farmer reads an advertisement for a plant food saying that it will make plants grow faster and taller. The farmer predicts that taller plants will have more blossoms and performs the following experiment to test this hypothesis. Two groups of 10 plants each are grown in identical pots filled with equal amounts of identical soil. The amount of sunlight, the room temperature, and the amount of water are held constant for both groups. Group A is given plant food at regular intervals according to the instructions on the package. Group B is not given plant food. The farmer observes the plants after 15 weeks of growth. The results are recorded below.

a. State the farmer's original hypothesis.

_____

_____

b. Based on the results of this experiment, is the farmer's original hypothesis correct?

Circle one: Yes No Explain your answer.

_____

_____

3. Which statement is an inference?

(1) A thermometer shows that the air temperature is 56°F.

(2) A mineral sample of galena produced a gray-black streak when tested.

(3) Based on previous data, ten hurricanes may occur in the year 2013.

(4) A weathervane indicates the wind is coming from the west.

4. Which dinosaur most likely evolved from Coelophysis?

(1) Theodont (2) Tyrannosaurus (3) Triceratops (4) Camptosaurus

5. A student goes skateboarding a few times a week. The student notices that she can go faster while skating on some level surfaces than on others. She hypothesizes that speed has something to do with the surface she is skating on. The student wants to design an experiment to test this hypothesis.

a. Identify the independent (manipulated) variable in the experiment. _____

b. Identify the dependent (responding) variable in the experiment. _____

c. Identify two factors that will need to be held constant in the experiment.

_____

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Unit Two- Living Things

All living things have a cellular organization, contain similar chemicals, use energy, respond to their surroundings, grow and develop, and reproduce. All organisms are made of small building blocks called cells.

Vocabulary:

Tissue:

Organ:

Organ System:

Vascular Tissue:

Nucleus:

Cytoplasm:

Cell Membrane:

Chloroplasts:

Cell Wall:

Classification:

Kingdom:

Species:

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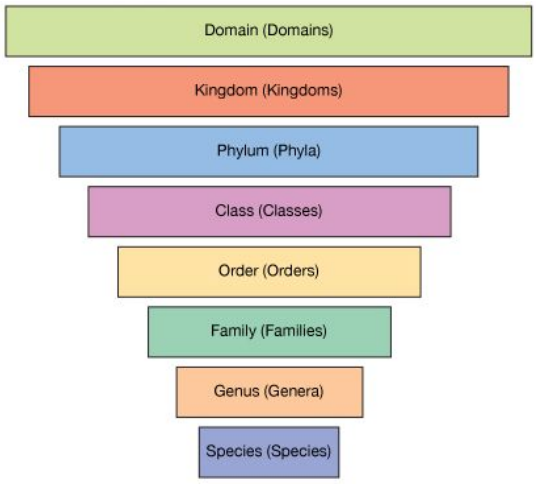

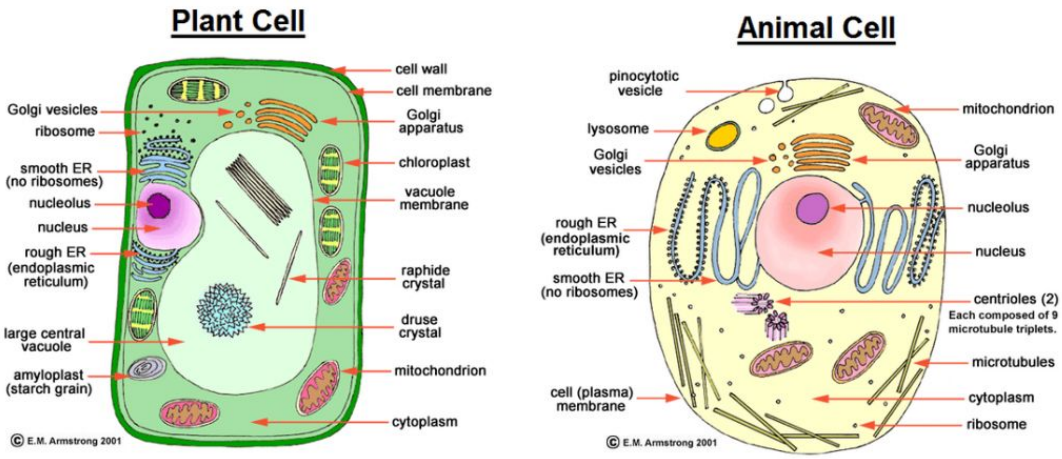

Review Questions:

1. Base your answers to the bird head diagrams below and the dichotomous key that follows. The birds are labeled A, B, C, and D.

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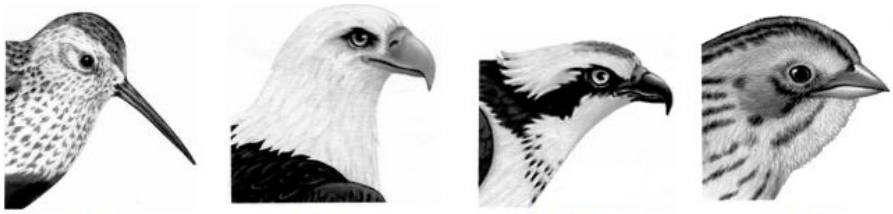


Bird A Bird B Bird C Bird D

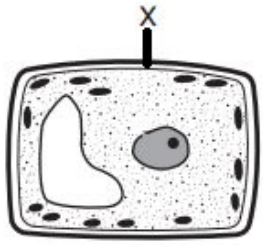
(Not drawn to scale)

Dichotomous Key

Step	Description
1a	beak longer than head..... go to 2
1b	beak shorter than head..... go to 3
2a	streaked feathers..... dunlin
2b	nonstreaked feathers..... black skimmer
3a	hooked beak..... go to 4
3b	nonhooked beak..... Baird's sparrow
4a	stripe on head..... osprey
4b	no stripe on head..... bald eagle

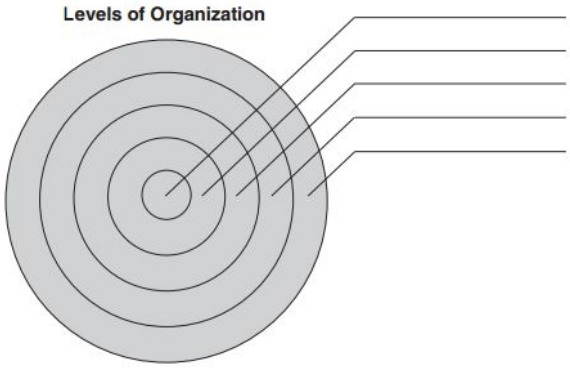
Based on the dichotomous key, which bird is a Baird's sparrow? (1) A (2) B (3) C (4) D

2. The diagram below represents a plant cell. Letter X represents a structure in the cell. Which cell structure is represented by X? _____



3. Which of the following characteristics do all plants share?
(1) being unicellular (2) producing flowers (3) being a prokaryote (4) being an autotroph

4. In multicellular organisms, cells are organized so that the organism can carry out life functions. The diagram below represents the five levels of organization. Complete the diagram by placing each of the labels organ, cell, organism, organ system and tissue, at the correct level.



Unit Three-Human Body

The human body is everything that makes up, well, you. The basic parts of the human body are the head, neck, torso, arms and legs. The levels of organization in the human body consists of cells,

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tissues, and organ systems. They ensure homeostasis and the viability of human body. Humans have five vital organs that are essential for survival; the brain, heart, kidneys, liver and lungs.Our bodies consist of a number of biological systems that carry out specific functions necessary for everyday living.

Vocabulary:

Homeostasis:

Metabolism:

Nutrients:

Skeletal System:

Muscular System:

Cartilage:

Ligaments:

Tendons:

Cellular Respiration:

Respiratory System:

Circulatory System:

Blood Vessels:

Digestive System:

Enzymes:

Excretory System:

Nervous System:

Endocrine System:

Hormones:

Fertilization:

Male Reproductive System:

Female Reproductive System:

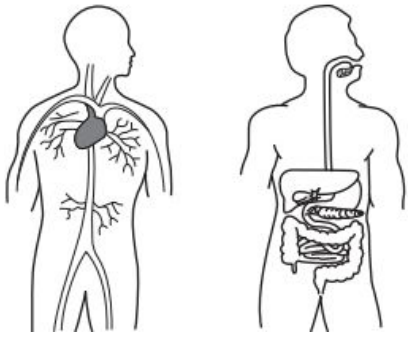
Immune System:

Pathogens:

Cancer:

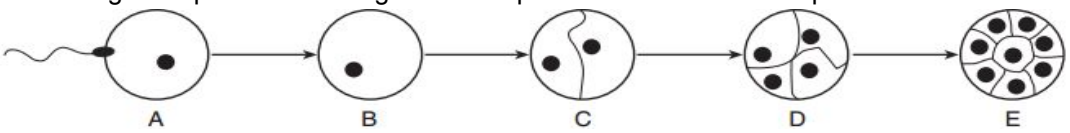
Review Questions:

1. The diagrams below represent two systems of the human body.



Which two systems are represented in the diagrams?
(1) endocrine and skeletal (2) endocrine and respiratory (3) circulatory and respiratory (4) circulatory and digestive

2. Diagrams A through E represent five stages in a simplified model of sexual reproduction and development.



At which stage is fertilization occurring? (1) A (2) B (3) C (4) E

3. Most hormones are produced by which human organ system?
(1) digestive (2) endocrine (3) respiratory (4) nervous

4. A body cell that is undergoing abnormal cell division is most likely
(1) producing sex cells (2) transporting nutrients (3) forming cancerous cells (4) developing an infection

5. Describe one way that food is mechanically changed during the process of digestion.

_____
_____

6. Circle one body system from below and describe how that body system works together with the digestive system. Circle one: circulatory skeletal

_____
_____

7. The human respiratory system is responsible for removing
(1) fat from cells (2) carbon dioxide from blood (3) hormones from glands (4) nutrients from food

8. A dialysis machine can be used to remove waste from a patient's blood. Which human body system works in a similar way? (1) reproductive (2) excretory (3) digestive (4) endocrine

9. Which pathway do most nutrients take after a person takes a bite of food?
(1) digestive system → circulatory system → body cells
(2) circulatory system → body cells → digestive system
(3) digestive system → body cells → circulatory system
(4) circulatory system → digestive system → body cells

10.

Major Function	Human Organ System
moves substances to and from all cells of the body	_____ system
creates sex cells and offspring	_____ system
breaks down food	_____ system

Unit Four- Genetics and Evolution

Some people have curly hair; others have straight hair. The different traits you see around you are determined by a variety of inheritance patterns. Some human traits are controlled by single genes with two alleles, and others by single genes with multiple alleles. In humans and other organisms, the effects of genes are often influenced by the environment as well. If an organism faces an environment with harsh conditions they must adapt, causing some species to gradually change over many generations (evolution).

<u>Vocabulary:</u>

Genes:

Chromosome:

DNA:

Alleles:

Heredity:

Sexual Reproduction:

Asexual Reproduction:

Dominant:

Recessive:

Punnett Square:

Pedigree Chart:

Trait:

Adaptation:

Mutation:

Natural Selection:

Selective Breeding:

Genetic Engineering:

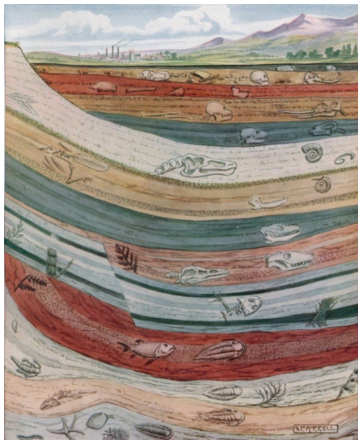
Competition:

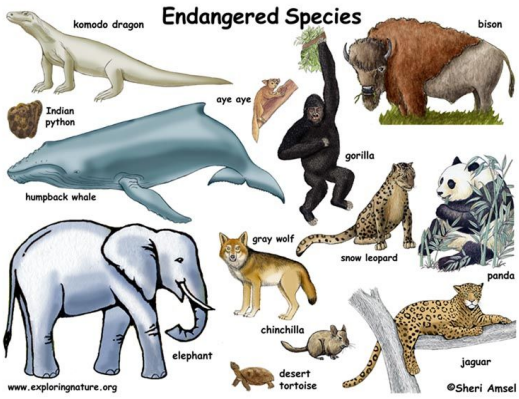
Extinction:

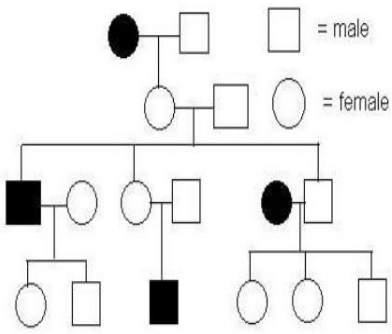
Endangered Species:

Evolve:

Sedimentary Rocks:







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Review Questions:

1. The hereditary material in corn plants can be altered by scientists so the plants produce more corn. Which term identifies this process?_____

2a. Complete the Punnett square below to show the probability of the results of crossing two Rr parents.

	R	r
R		
r		

Key: R = gene for round shape in peas
r = gene for wrinkled shape in peas

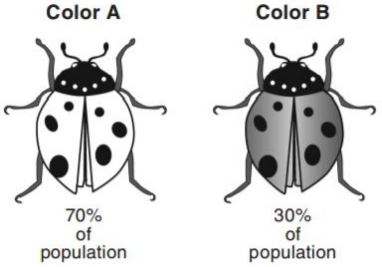
2b. What percentage of the offspring will have a round shape? _____

3. The female sex cell in a rabbit has 22 chromosomes. How many chromosomes are in each body cell? _____

4. Which process is a cause of variation in a species?
(1) metamorphosis (2) cellular respiration (3) sexual reproduction (4) regulation

5. In rabbits, the gene for brown fur (B) is dominant over the gene for white fur (b). What are the genetic makeups of two parent rabbits whose offspring can have only white fur? (Parent 1)_____ (Parent 2) _____

6. The diagram below represents a species of beetle (ladybug) with two different body colors labeled A and B. These beetles live on trees and are eaten by birds. The percentage of each body color in the population of this species is indicated. The habitat of this beetle population is a group of trees with light-colored bark. Based on the information provided, explain why the beetle population in this habitat contains a higher percentage of beetles with body color A.



_____

_____

_____

7. The chart on the board describes typical fertilization and development in three different animals.
a. Which animals in the chart undergo internal fertilization? _____ and _____
b. Which animals in the chart develop externally?_____ and _____

8. The diagram on the board represents a cross section of several layers of sedimentary rock that have not been overturned.
a. Explain why the fossils in rock layer A are more likely to resemble life-forms that exist today.

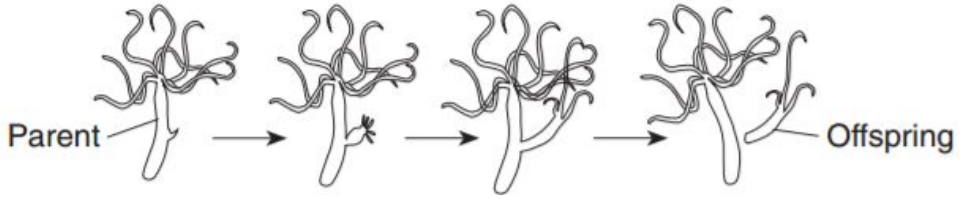
_____

b. State one conclusion that many scientists have made about Earth's past by studying fossils.

_____

9. Selective breeding is a process used by some farmers. Complete the chart on the board by reading the description and then writing either yes, if it is an example of selective breeding, or no, if it is not an example of selective breeding.

10. The hydra shown below is reproducing asexually. What percentage of the offspring's genetic information is the same as the genetic information of the parent? (1) 25% (2) 50% (3) 75% (4) 100%



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Unit Five-Reproduction

Reproduction is a fundamental feature of all known life; each individual organism exists as the result of reproduction whether it be asexually or sexually. Sexual reproduction is the most common form of reproduction in eukaryotes. As in all living things, reproduction is part of the life cycle of plants as well.

Vocabulary:

Asexual reproduction:

Sexual reproduction:

Egg cell:

Sperm cell:

Fertilization:

Zygote:

Stamen:

Pistil:

Mitosis:

Meiosis:

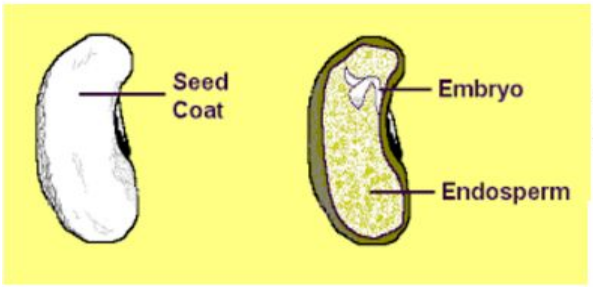
Pollen:

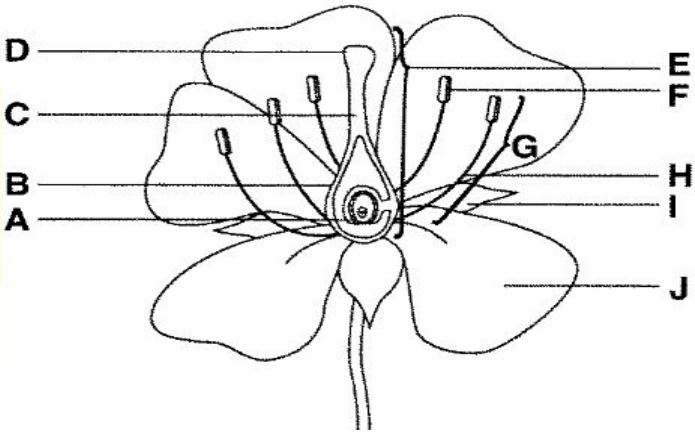
Embryo

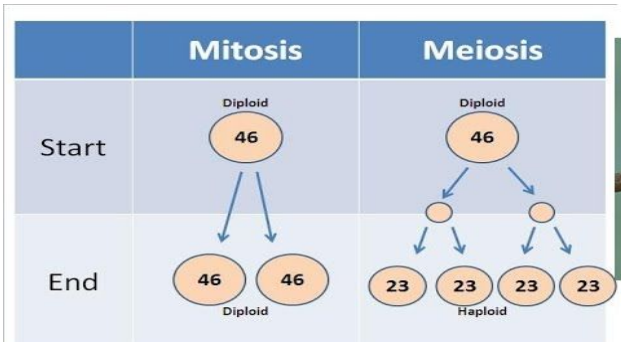
Spore:

Gamete:

Metamorphosis







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Review Questions:

1. The diagram below represents a bird, fertilized eggs, and a nest. Do birds exhibit mainly internal development or external development?

Circle the correct answer and give one piece of evidence to support your answer.
Circle one: internal external
Evidence:_____
_____
_____

2. Which evidence from the diagram on the board indicates that both of the organisms shown are reproducing asexually?

_____

3. If the parent hydra has 32 chromosomes, how many chromosomes does the hydra offspring have?_____

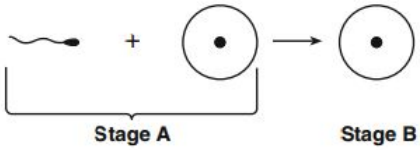
4. A major function of a plant's roots is to
(1) produce flowers (2) release oxygen (3) transport carbon dioxide (4) take in water

5. Which cell division process results in the formation of a new cell with the same # of chromosomes?

_____

6. The diagram on the board shows a magnified view of a cross section of a plant root tip. Four parts of the root and the process that each performs are shown. Which process is directly responsible for root growth in plants?
(1) storage (2) absorption (3) transportation (4) cell division

7. Label each of the two cells represented at stage A.



8. Identify one structural change to the organism's body that occurs during its life cycle (on board).

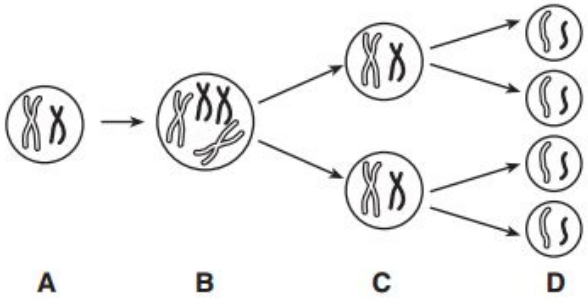
_____
_____

__ 9. An environmental change causes a decrease in the amount of oxygen that is dissolved in the pond water. Explain why this change would have a greater effect on the frog during the tadpole stage than during the adult stage.

_____

10. How does the number of chromosomes in the cell at A typically compare to the number of chromosomes in one of the cells at D?

_____



11. Explain why the offspring of 2 rabbits will not be genetically identical to either parent.

_____

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_____
_____
_____

12. Which statement about the organisms shown on the board is accurate?
(1) They are all single celled and have similar organs. (2) They are all single celled and have identical organs.
(3) They are all multicellular and have similar organs. (4) They are all multicellular and have identical organs.

Unit Six- Ecology

A system that includes all living organisms in an area as well as its physical environment functioning together as a unit. Ecology is the scientific analysis and study of interactions among organisms and their environment. An ecosystem is made up of plants, animals, microorganisms, soil, rocks, minerals, water sources and the local atmosphere interacting with one another. Ecosystems maintain themselves by cycling energy and nutrients obtained from external sources.

<u>Vocabulary:</u>

Producers:

Photosynthesis:

Consumers:

Decomposers:

Herbivores:

Carnivores:

Omnivores:

Evaporation:

Transpiration:

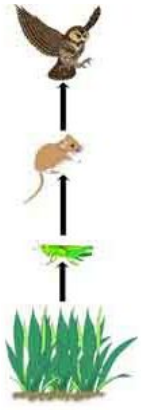
Nitrogen cycle:

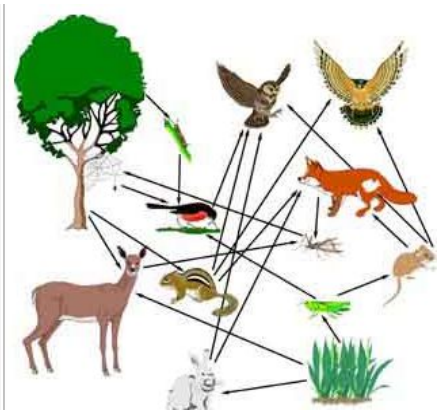
Carbon cycle:

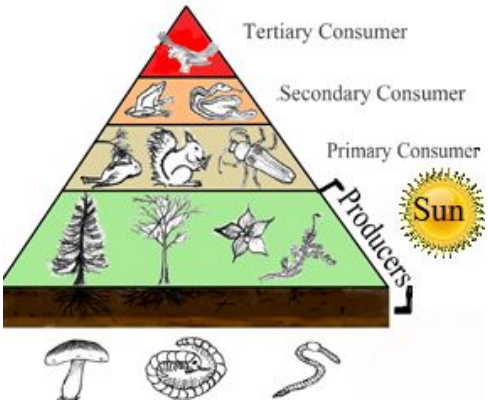
Water cycle:

Population:

Community:







Review Questions:

1. In the diagram below, letters A, B, C, and D represent four different processes that occur during the water cycle. During which process is water released from land organisms into the atmosphere?_____

2. A biological community is made up of all the

(1) populations living in an area (2) natural resources present in an area

(3) members of a species on Earth (4) environments on Earth

3. The bacteria and fungi that break down plant and animal materials are classified as _____

4. If an ecosystem's balance is disturbed by a volcanic eruption, what will most likely occur?

(1) The ecosystem will not change from its original state.

(2) The ecosystem will eventually become balanced again.

(3) The consumers in the ecosystem will begin to consume carbon dioxide.

(4) The consumers in the ecosystem will begin to produce more oxygen.

5. Looking at the diagram on the board, which organism(s) are herbivores?_____

6. The diagram on the board shows several different organisms found in an area. The worms in the diagram represent (1) a community (2) an ecosystem (3) a habitat (4) a population

7. The diagram below shows how a plant community changed over 300 years. Which process caused the gradual changes shown in this plant community?

(1) urban growth (2) global warming (3) environmental pollution (4) ecological succession

8a. Looking at the diagram on the board, which organism labeled in this food web provides energy, either directly or indirectly, to all of the other organisms? _____

8b. Explain why the amount of food available to the slug population might increase if the aphid population decreased.

_____

9. In the below, identify each organism as a producer, consumer, or decomposer based on its source of nutrients.

Organism	Source of Nutrients	Type of Organism
mushroom	breaks down dead tree roots	
algae	makes its own food	
cow	eats plants	

10.The diagram on the board shows part of the water cycle. Complete the chart below by identifying the water cycle process represented by each letter in the diagram.

Letter	Process
A	_____
B	_____
C	_____
D	_____

11. Which part of the plant is directly involved in sexual reproduction? _____

12. In which part of the plant does most photosynthesis occur? _____

13. Give an example of one carnivore shown in the diagram on the board. _____

Unit Seven-The Solar System

Our Solar System consists of an average star we call the Sun, the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. It also includes: the satellites of the planets; numerous comets, asteroids, and meteoroids. Scientists estimate that there may be tens of billions of solar systems in our galaxy, perhaps even as many as 100 billion.

Vocabulary:

Solar System:

Light-year:

Gravity:

Inertia:

Orbit:

Inner Planets:

Outer Planets:

Axis:

Longitude:

Latitude:

Lunar Cycle:

Waxing:

Waning:

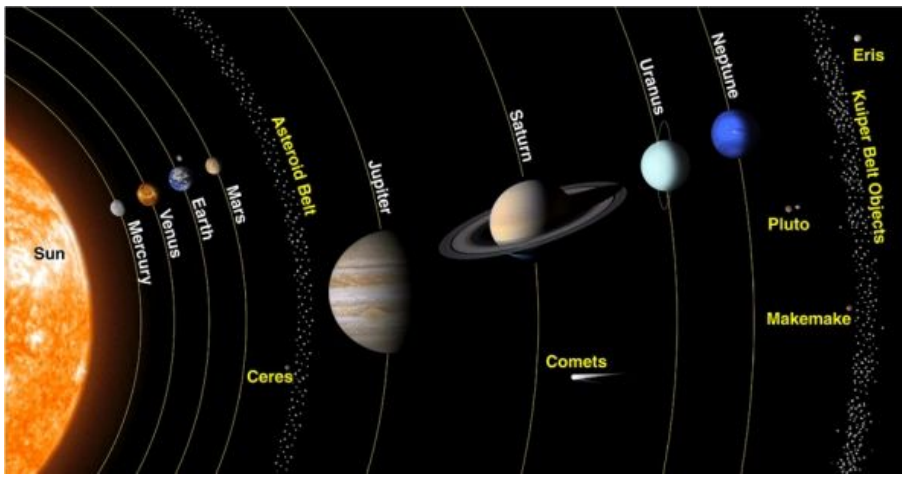
Tides:

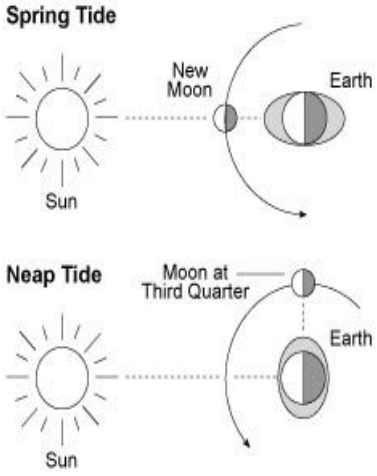
Neap Tide:

Spring Tide:

Solar Eclipse:

Lunar Eclipse:





Review Questions:

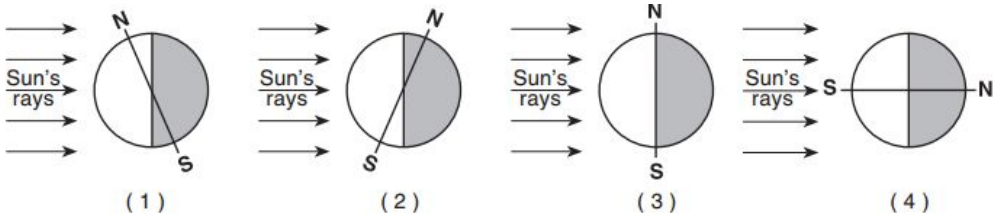
1. According to the graph on the board, the Sun is best described as
(1) massive sized, with a surface temperature of approximately 20,000 K
(2) massive sized, with a surface temperature of approximately 10,000 K
(3) average sized, with a surface temperature of approximately 8,000 K
(4) average sized, with a surface temperature of approximately 6,000 K

2. Looking at the diagram on the board, at which Moon position would a person on Earth see the entire lighted half of the Moon (full-Moon phase)? (1) A (2) B (3) C
(4) D

3. Approximately how long does it take Earth to complete one orbit around the Sun?
_____

4.The layered mixture of gases surrounding Earth is called the
(1) atmosphere (2) hydrosphere (3) lithosphere
(4) hemisphere

5. Which diagram best represents the tilt of Earth's axis in June?



6. The photograph below is an object in space that has an icy core with a tail of gas and dust extending for millions of kilometers, it is most likely (1) a star (3) a moon (2) an asteroid (4) a comet

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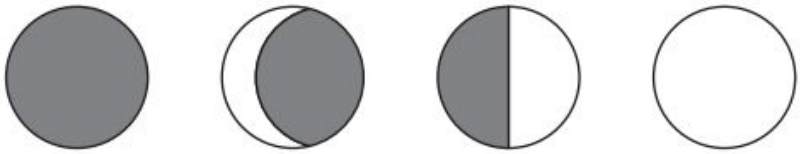
7. The diagram on the board shows the motion of the Moon and the Earth as seen from the North Pole. Which Moon phase will usually be seen from Earth when the Moon is in this position?



8. Tides are caused by the pull of what objects? _____
9. What kinds of tides occur when the moon is aligned with the sun? _____
10. What kinds of tides occur when the moon is not aligned with the sun?
_____
11. Why does the moon have light?_____
12. A full Moon is observed in Buffalo, New York, on June 1. Approximately when will the next full Moon be observed in Buffalo? (1) June 7 (2) June 15 (3) July 1 (4) July 7
13. The diagram below shows Earth at four locations in its orbit around the Sun. Which motion do the arrows in the diagram represent? (1) Earth's rotation(2) the Sun's rotation (3) Earth's revolution (4) the Sun's revolution
14. On which date does North America usually experience the longest period of daylight?
(1) March 21 (2) June 21 (3) September 21 (4) December 21

Unit Eight- The Earth

Vocabulary:

Atmosphere:

Lithosphere:

Mantle:

Rock Cycle:

Igneous Rock:

Sedimentary Rock:

Metamorphic Rock:

Fossil:

Tectonic Plates:

Convection Cells:

Theory of Tectonic Plates:

Troposphere:

Stratosphere:

Thermosphere:

Ozone Layer:

Air mass:

Weather:

Climate:

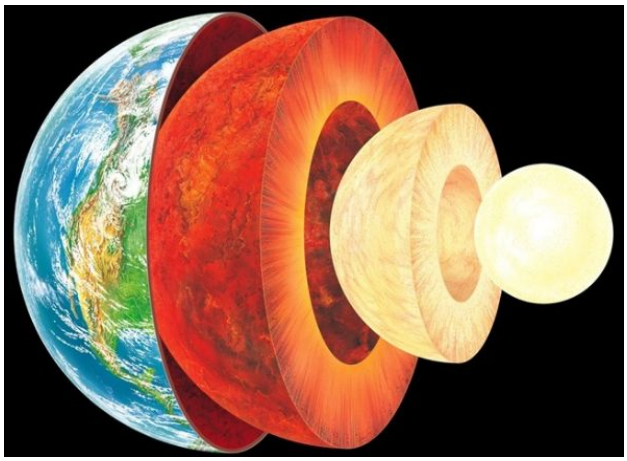
Weathering:

Sediments:

Erosion:

Soil:

Glacier:



Pangea–250 million years ago

Review Questions:

1. Volcanic eruptions are caused primarily by the movement of
(1) rock by erosion (2) Earth in its orbit (3) planetary winds (4) tectonic plates

2. The thin layer of rock on Earth's surface is the (1) atmosphere (3) hydrosphere (2) hemisphere (4) lithosphere

3. Which energy source is nonrenewable? (1) sunlight (2) biomass (3) wind (4) fossil fuel

4. Which geologic process occurs when the acid in precipitation dissolves certain types of rock?
(1) faulting (2) tilting (3) weathering (4) erupting

5. The map on the board shows latitude and longitude lines for a portion of North America. Points A and B represent two cities. Compared to the location of city A, the location of city B is at
(1) the same latitude, but a different longitude (2) the same latitude and same longitude
(3) a different latitude and the same longitude (4) a different latitude and different longitude

6. Scientists have discovered fossils of the same organisms in many different parts of the world. These fossils provide evidence that
(1) most life-forms that existed in the past are still present today
(2) most of Earth's surface was once covered by molten rock
(3) rocks have been transformed from one type to another
(4) the continents were once joined together

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7. State one disadvantage of burning coal, other than coal is a nonrenewable energy source.

_____

_____

8. State one alternative to burning fossil fuels in order to produce electricity.

_____

_____

9. Rocks are classified as sedimentary, metamorphic, or igneous on the basis of the
(1) age of the rocks (2) types of fossils the rocks contain
(3) number of minerals found in the rocks (4) way the rocks were formed

10. Which temperature and moisture conditions describe an air mass that originates over the Atlantic Ocean near the equator? (1) warm and dry (2) warm and humid (3) cool and dry (4) cool and humid

11. Looking at map on the board, precipitation is most likely occurring at A because it is located
(1) on a cold ocean surface (2) on a warm land surface (3) near the cold front (4) near the warm front

12. Which material is primarily a mixture of weathered rock and organic matter?
(1) minerals (2) soil (3) ocean water (4) seashells

13. Most of Earth's major earthquakes are caused by
(1) seasonal heating and cooling of Earth's surface (2) weathering of rock at Earth's surface
(3) Earth's gravitational attraction to the Moon (4) faulting of rock in Earth's crust

14. The arrows in the diagram on the board show the circulation of air on a sunny day. The air circulation shown is caused by
(1) both hot air and cool air sinking (2) both hot air and cool air rising
(3) hot air sinking and cool air rising (4) hot air rising and cool air sinking

15. State one specific action that humans can take to reduce the rate of increase in the concentration of carbon dioxide in Earth's atmosphere.

_____

Unit Nine- Properties of Matter

Matter can have many different properties that depend on its makeup. Materials can be hard or soft, rough or smooth, hot or cold, liquid, solid, or gas. Every form of matter has two kinds of properties- physical properties and chemical properties.

Vocabulary:

Atoms: elements are made up of atoms, positively charged center (nucleus) surrounded by negative charge

Elements: simplest substances, all matter is made up of elements (Aluminum is an element-used for foil)

Compounds: substance made up of two or more elements that are chemically combined

Metals: hard, shiny, malleable (able to be hammered or pressed permanently out of shape without breaking or cracking), fusible, and ductile, with good electrical and thermal conductivity

Nonmetals: The nonmetals are brittle, not malleable, poor conductors of both heat and electricity, and tend to gain electrons in chemical reactions.

Metalloids:

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Periodic table:

Molecules:

Physical properties:

Density: density =mass/volume

Buoyancy:

Phases of matter:

Evaporation:

Condensation:

Mixture: made of 2 or more substances that are not chemically combined

Solution:

Solutes:

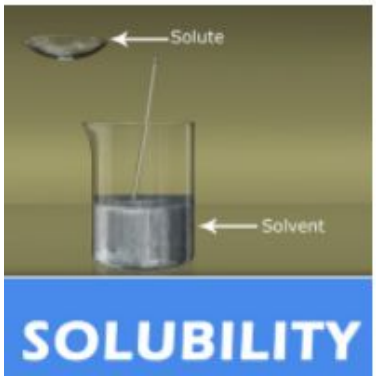
Solvent:

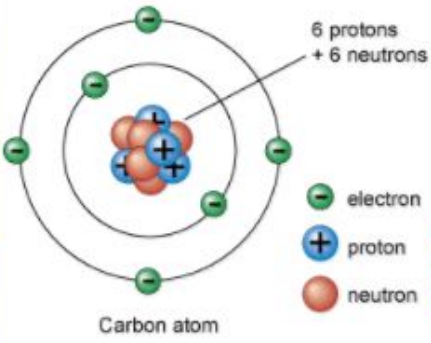
Solubility:

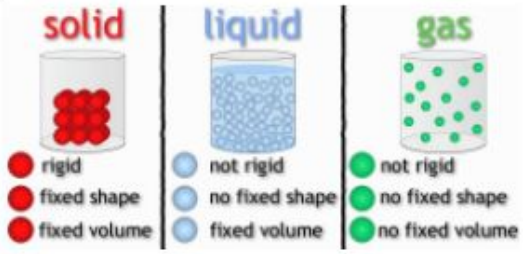
Physical change: characteristic that can be observed without changing it into another substance. (Water freezing)

Chemical change: substance has ability to change into different substances. (car rusting)

Law of conservation of mass: matter is not created or destroyed, atoms or only rearranged

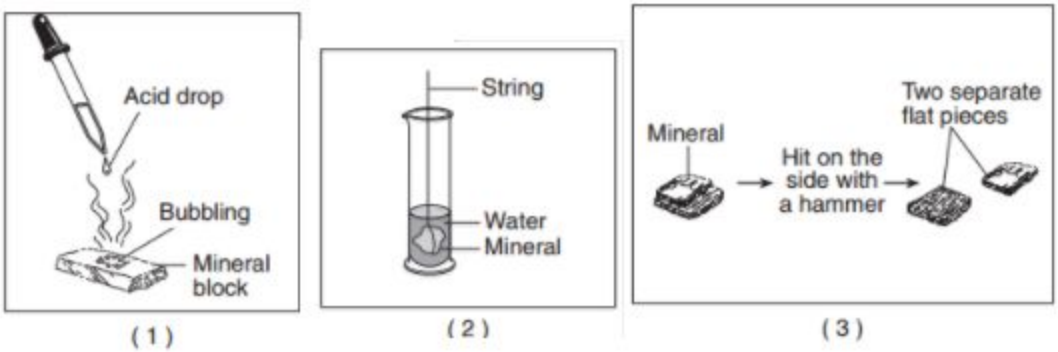






Review Questions:

1. Which diagram represents a chemical reaction used to identify a mineral?



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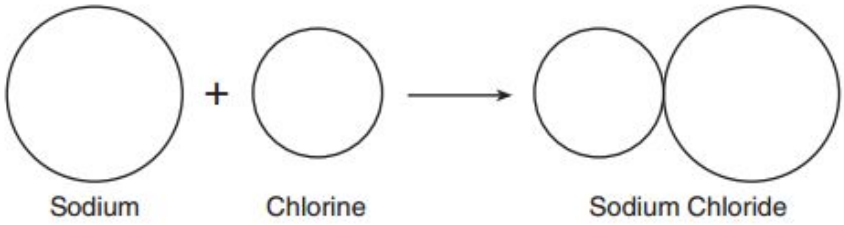
2.The diagram below represents a sodium atom bonding to a chlorine atom to form sodium chloride. Which statement is supported by this diagram?



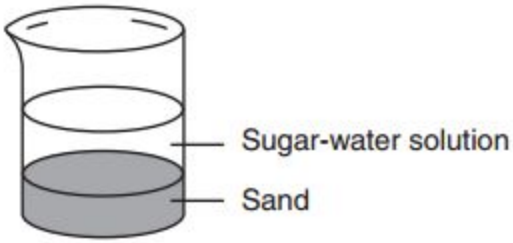
(1) Sodium chloride is an element. (2) Sodium chloride is a mixture.
(3) Sodium chloride is a compound. (4) Sodium chloride is composed of only one atom.

3. The equation below shows the products formed when a solution of silver nitrate (AgNO3) reacts with a solution of sodium chloride (NaCl).

$$\underset{\text{(Reactants)}}{AgNO_3 + NaCl} \rightarrow \underset{\text{(Products)}}{NaNO_3 + AgCl}$$

In this equation, the total mass of the reactants is
(1) greater than the total mass of the products (2) equal to the total mass of the products
(3) equal to the mass of AgCl (4) less than the mass of AgCl

The diagram represents a beaker containing sugar, water, and sand. The sugar is dissolved in the water, creating a solution. The sand has settled to the bottom of the beaker.



4a. Describe one method to separate the sand from the other substances in the beaker.

_____
_____
_____ 4b. Describe one method to separate the dissolved sugar from the sugar-water solution.

_____
_____
_____

Unit Ten-Energy

Energy is all around you and it comes in many forms.Forms of energy related to changes in matter may include kinetic, potential, chemical, electromagnetic, electrical, and thermal energy.

Vocabulary:

Mechanical energy: combination of both potential and kinetic energy

Kinetic energy: energy in motion

Potential energy: stored energy

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Heat energy: can be transferred, moving from got to cool

Conduction:

Convection:

Radiation:

Visible spectrum:

Electromagnetic spectrum:

Refract:

Reflect:

Transmit: when light waves move all the way through a material without being absorbed

Vibration:

Sound waves:

Circuit: path or line through which an electrical current flows

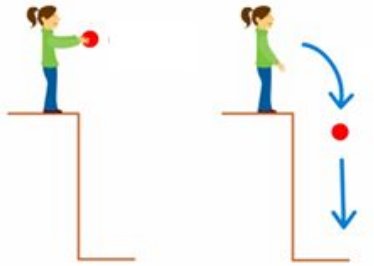
Conductor: ability of an object to transfer heat or electricity to another object

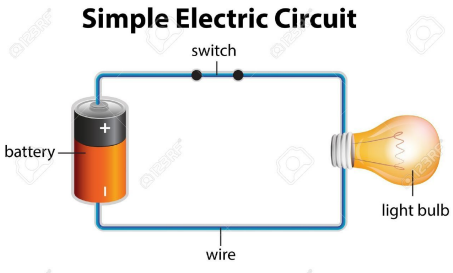
Insulator:

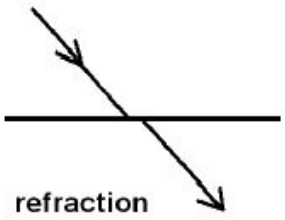
Law of conservation of energy: energy is never created or destroyed, it can only be transformed

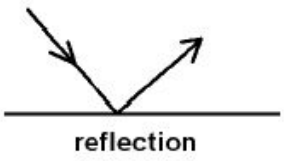
Non renewable resource:

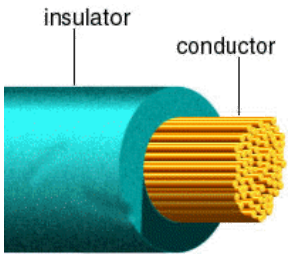
Biomass:





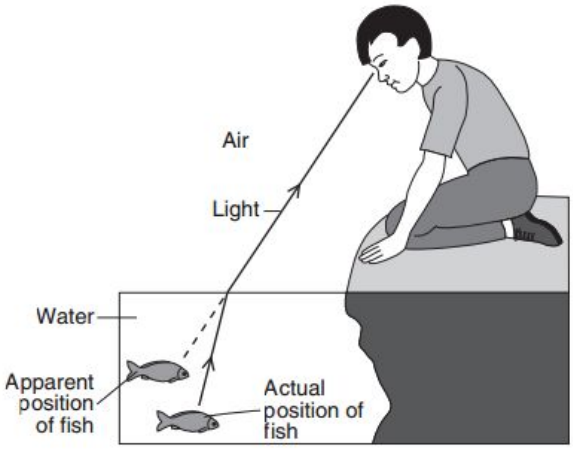






Review Questions:

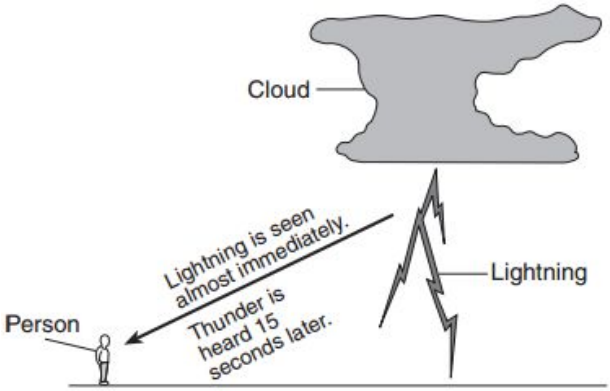
1. The diagram below represents a person looking at a fish in the water.



The actual position of the fish is different from the apparent position of the fish because as light travels from the water into the air, the light is

(1) refracted (2) reflected (3) transmitted (4) absorbed

The diagram represents a person who heard thunder 15 seconds after seeing lightning.



2a. If it takes 5 seconds for the sound of thunder to travel 1 mile, how many miles was the person from the lightning bolt? _____ miles

2b. Explain why the person heard the thunder after seeing the lightning.

_____

_____

_____

3. Which type of energy is transferred by vibrational waves?

_____

4. Which device directly converts chemical energy into electrical energy?

(1) solar-powered calculator (2) wood-burning stove

(3) battery-powered flashlight (4) wind-powered sailboat

5. Which energy source is nonrenewable? (1) sunlight (2) biomass (3) wind (4) fossil fuel

6. A lamp converts electrical energy to light energy. In addition to the light energy, much of this electrical energy is also converted to

(1) mechanical energy (2) chemical energy

(3) heat energy (4) nuclear energy

7. Which process transfers heat when particles collide in a solid?

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(1) convection (2) conduction (3) radiation (4) evaporation

Unit Eleven- Force and Motion

If you are sitting in a chair, are you moving? No because an object is in motion if the distance from another object is changing. Choose a stationary reference point, like a tree, to decide if objects are in motion. Newton's second law of motion describe the relationship with force and acceleration. The more force you exert on an object the greater the acceleration.

Vocabulary:

Motion:

Inertia: resistance to change in motion- Newton's first law of motion

Force: push or pull, F=mass x acceleration, Newton's second law of motion

Acceleration:

Gravity: force that pulls objects towards each other

Mass:

Electrons:

Magnetism:

Poles:

Friction: force that two surfaces exert on each other when they rub

Lubricant:

Simple machines: have few working parts, make our work easier and help us move things

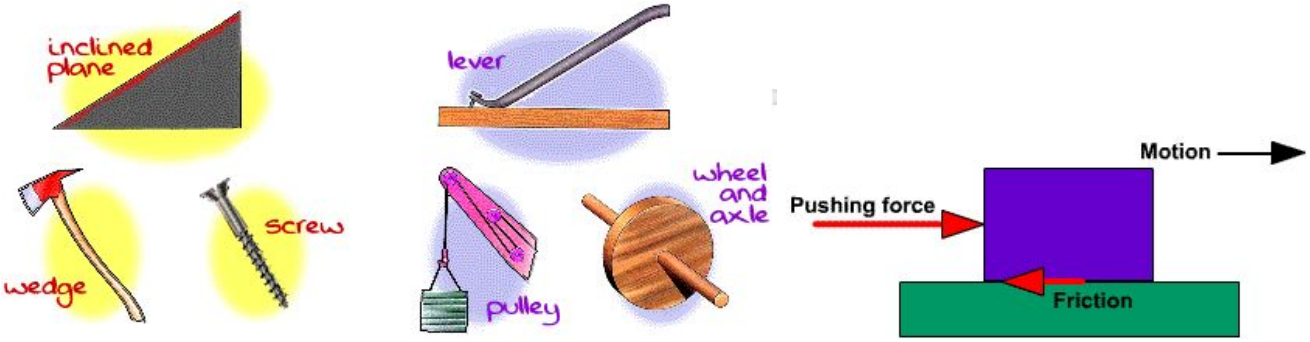
Inclined planes:

Levers:

Wheels and axles: used to carry loads around for long distances (stroller)

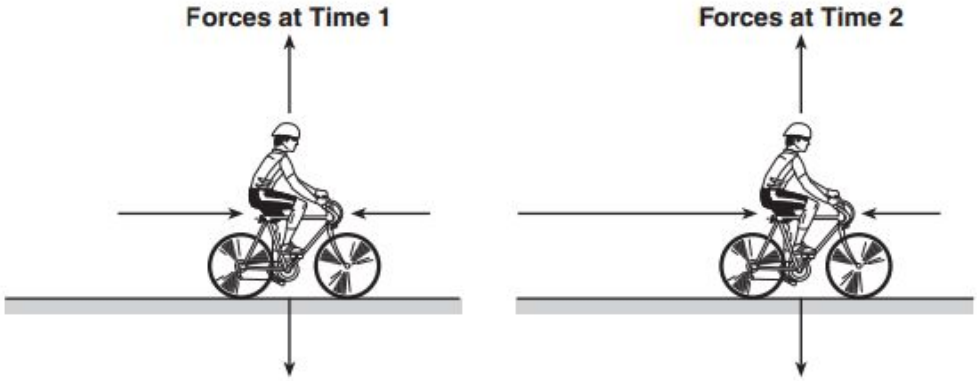
Pulleys: wheel over which a pulled rope/chain, used for lifting a load (pulling a bucket from a well using rope)

Complex machines: simple machines combined (car, bicycle)



Review Questions:

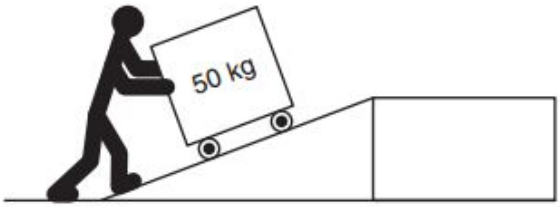
1. The arrows in the diagram below represent the forces acting on a moving bicycle at two different times, time 1 and time 2. The length of each arrow represents the amount of force being applied.



As a result of the change in the forces from time 1 to time 2, the bicyclist will (1) move slower in a forward direction (3) move faster in a forward direction (2) move in a backward direction (4) stop moving

2. The volume of a sample of sulfur was measured to be 5.0 cm3 and the density was calculated to be 2.0 g/cm3 What is the mass of this sample?
(1) 2.5 grams (2) 2.0 grams (3) 5.0 grams (4) 10.0 grams

The diagram represents a person pushing a 50-kg box up a ramp.



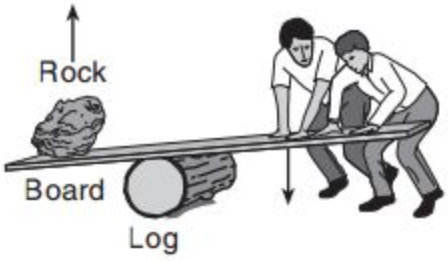
3a. Which two simple machines are being used in the diagram?

(1) inclined plane; pulley (2) inclined plane; wheel and axle
(3) lever; pulley (4) lever; wheel and axle

3b. Which force will decrease if the surface of the ramp is made smoother?
(1) gravity (2) magnetism (3) friction (4) electricity

4. Scientists have created trains that use magnets to make the trains float above the tracks as they travel. These trains float because
(1) the track is waxed (2) the like poles repel (3) the train has a low density (4) a chemical change occurs

The diagram below represents two people using a board and a log as a simple machine to lift a large rock.



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5. What force must the people overcome in order to lift the rock? _____