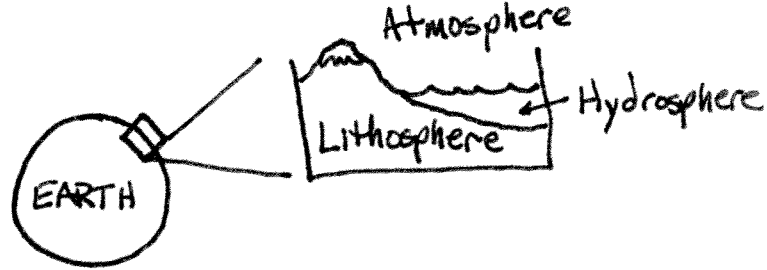


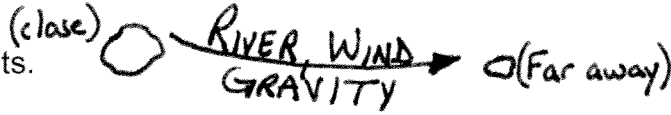
**Everything I need
to know to pass
the NYS
Intermediate
Level
Science
Assessment!**

Earth Science

- 1. Lithosphere is the earth's rock layer
- Hydrosphere is the earth's water layer
- Atmosphere is the earth's air layer.

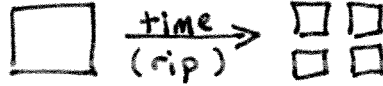


- 2. Erosion is to carry away rock sediments.



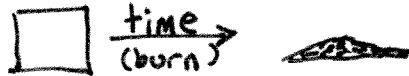
- 3. Physical weathering is to breakdown and keeps the same substance.

ex: ripping paper, tree root action.

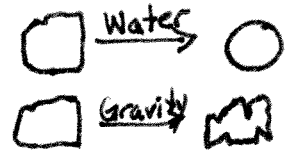


Chemical weathering is to breakdown and get a new substance.

ex: burning paper to ash, rust.



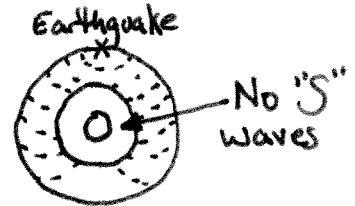
- 4. Gravity, wind, water, and glaciers are forces of erosion. Wind and moving water make sediments round in shape and gravity and glacier are angular.



- 5. Earthquakes, volcanoes, and faults (crack in the earth's crust) are found near plate boundaries.



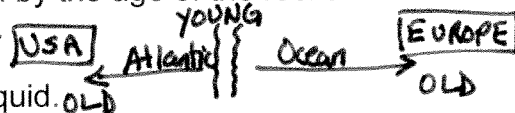
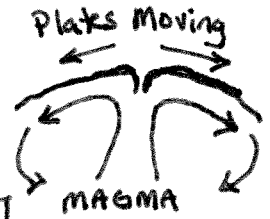
- 6. Earthquakes produce P and S waves. P waves are primary waves that go through solids and liquids. S waves are secondary waves that only go through solids. The earth's interior has been learned by studying P and S waves.



- 7. The crust is the outer layer of the earth. The ocean crust is thinner than the continental crust.



- 8. The mantle is the earth's second layer. The magma in the mantle moves in currents which causes the tectonic plates to move. The magma in the mantle rises through the cracks in the ocean floor causing seafloor spreading. Seafloor spreading is proven by the age of the rocks with their relationship to the distance of the crack.

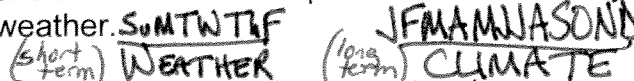


- 9. The outer core is the third layer and is a liquid.
- 10. The inner core is the fourth layer and is a solid.

- 11. All the continents fit together as one super continent called Pangaea.

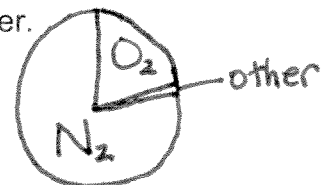


- 12. Weather is the daily conditions of the atmosphere. Climate is the yearly average of the daily weather.



- 13. The layers of the atmosphere are troposphere, stratosphere, mesosphere, and thermosphere. The troposphere is the only layer that has water.

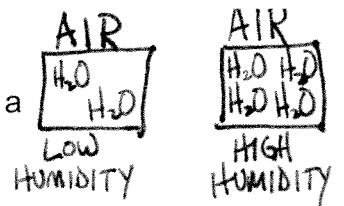
- 14. The atmosphere contains 78% nitrogen, 21% oxygen, and 1% other.



- 15. Air temperature is measured with a thermometer.

- 16. Air pressure is measured with a barometer.

17. Humidity is the moisture in the air that is measured with a hygrometer or a psychrometer.

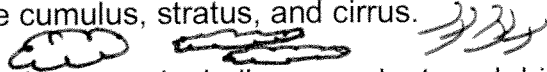


18. Wind speed is measured with an anemometer and wind direction is measured with the wind vane.



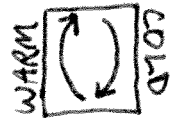
19. Wind is caused by the uneven heating of the earth's surface. We name wind by the direction in which it came from.

20. The three cloud types are cumulus, stratus, and cirrus.



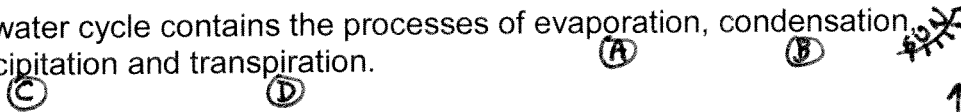
21. The five forms of precipitation are rain, hail, snow, sleet, and drizzle. We measure rain with a rain gauge.

22. Insolation stands for incoming solar radiation. Warm air rises cold air sinks. The earth's round shape causes different angles of insolation.



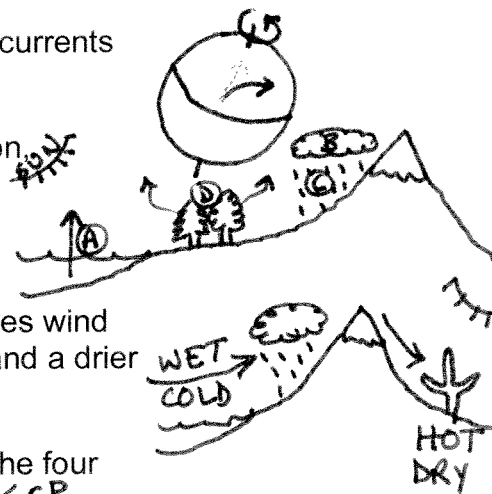
23. The coriolis effect is the turning or deflection of the wind and ocean currents caused by the earth's rotation.

24. The water cycle contains the processes of evaporation, condensation, precipitation and transpiration.

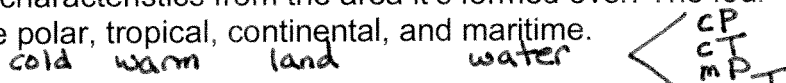


25. Climate is affected by latitude, bodies of water and mountains.

26. The windward side of the mountain is near the body of water, receives wind and clouds. The leeward side of the mountain has very little wind and a drier climate.



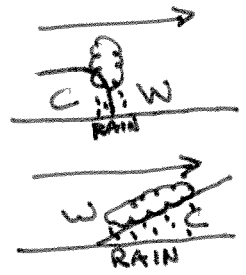
27. An air mass gets its characteristics from the area it's formed over. The four main conditions are polar, tropical, continental, and maritime.



28. High pressure systems bring dry weather and clear skies. Low pressure systems bring cloudy and damp weather.



29. A cold front is when a cold mass pushes a warm mass. A warm front is when a warm mass pushes a cold mass. Precipitation is found along fronts.



30. Isotherms connect points of equal temperatures.



31. Isobars connect points of equal air pressure.

32. Greenhouse effect traps CO² in the atmosphere increasing global warming.

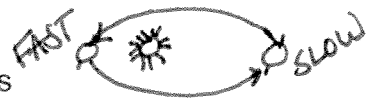
33. Rotation is to spin on its axis. Earth's Rotation rate is 15 degrees per hour = 24 hours.

$$\frac{360^\circ}{24 \text{ hrs.}} = 15^\circ/\text{hr}$$

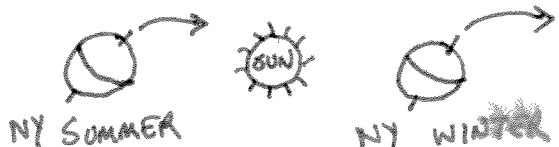
34. Revolution is to orbit around the sun. Earth's revolution rate is 1 degree per day = 365 days.

$$\frac{360^\circ}{365 \text{ days}} \approx 1^\circ/\text{day}$$

35. When the Earth is close to the sun, we travel faster and the pull of gravity is stronger.



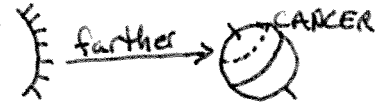
36. The main reason for seasons is the tilt of the earth.



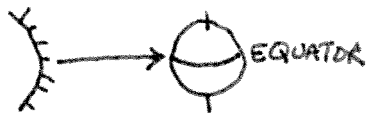
37. Winter solstice is Dec. 21, 9 hrs of light, sun strikes tropic of Capricorn 23.5°S, and we are close to sun.



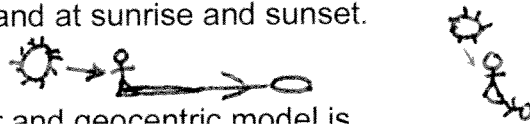
38. Summer solstice is June 21, 15 hrs of light, sun strikes tropic of cancer 23.5°N, and we are far from the sun.



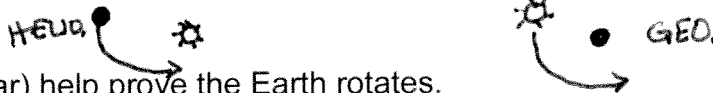
39. Equinoxes are fall – March 21, spring – Sept. 23, 12 hrs of light, and the sun strikes the equator.



40. The angle of the sun affects your shadow. The lower the angle of the sun, the longer your shadow. Low angles occur in winter and at sunrise and sunset. High angles occur in summer and at noon.



41. Heliocentric model is when the sun is in the center and geocentric model is when the earth is in the center.



42. Constellations and the sun (a star) help prove the Earth rotates.

43. My very educated mother just served us nine pizzas – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, (and Pluto.)

44. Asteroid belt separates the small solid planets from the giant gaseous planets which are between Mars and Jupiter.

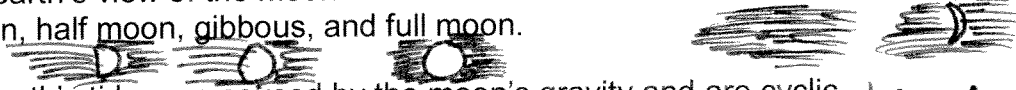


45. The farther the planet is from the sun, the longer the revolution.

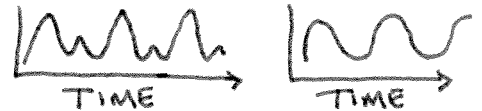


46. The Moon orbits the Earth and spins on its axis at same rate of 29 1/2 days. Rotation = revolution. (the dark side of the moon...Pink Floyd)

47. The phases of the moon are the apparent changes in the shape caused by the earth's view of the moon. Phases of the moon are: new moon, crescent moon, half moon, gibbous, and full moon.



48. The earth's tides are caused by the moon's gravity and are cyclic.



49. An eclipse occurs when the earth, sun, and moon line up.

A lunar eclipse occurs when the moon passes through the earth's shadow. A solar eclipse occurs when the moon casts its shadow on the earth.



50. In space, a rock is called a meteoroid, in the atmosphere it's a meteor and on earth's surface it's a meteorite.

51. The earth is in the solar system which is in the Milky Way galaxy which is in the universe. Planet → Solar System → Galaxy → Universe.



52. The color of the star determines its temperature, red is cool, and blue is hot.

53. Hydrogen (H) is the main fuel of the sun, H + H = Helium (He). This is called nuclear fusion.

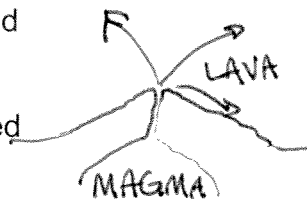


54. Gas and dust make a star which has a life cycle: star → stable star → compact star → red giant → nova → white dwarf.

55. All rocks are composed of minerals.

56. Physical properties of minerals are tested by streak, hardness, luster, cleavage, and color. Chemical properties of minerals are tested by the acid test.

57. Hot liquid rock below the crust is called magma and above the crust is called lava.



58. Igneous rock is made by cooling magma.

59. Sedimentary rocks are made by the compression and cementation of sediments. They are classified by the size of their sediments. This is the only rock type that can contain a fossil.

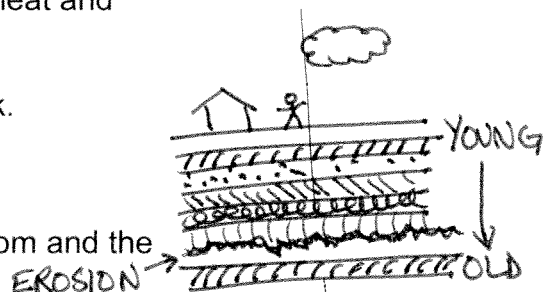


60. Metamorphic rocks are any rocks exposed to magma causing heat and pressure.

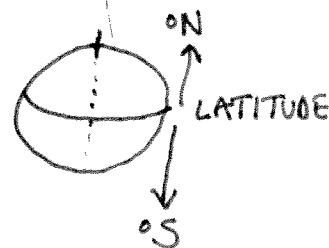
61. The rock cycle shows how any rock can be turned into any rock.

62. Rules for sequencing the history of rock layers are:

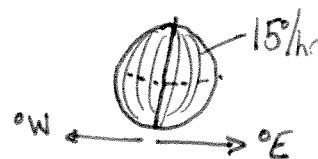
Layers form horizontally. If not overturned, the oldest is on the bottom and the youngest on the top. A wavy line indicates erosion.



63. Latitude lines are North and South and never touch. Longitude lines are east and west and meet at the poles. They also separate time zones which equals 15° per hour.

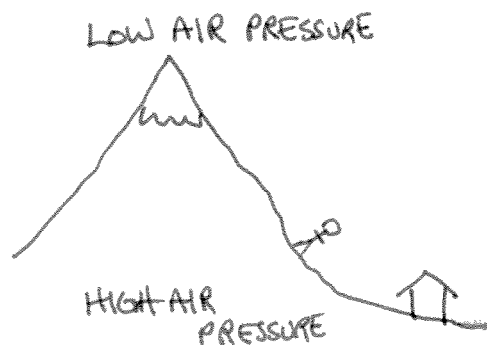
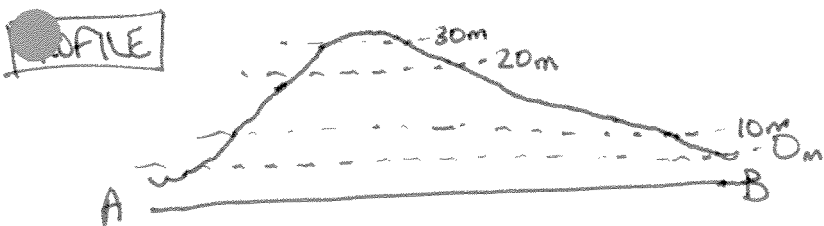
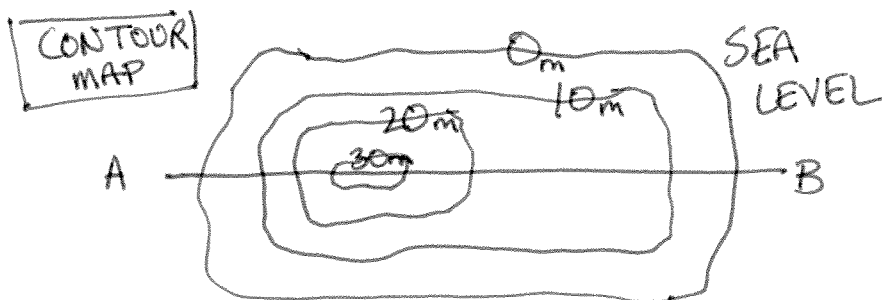


64. Contour lines connect equal points of elevation. The rules for contour maps are: the contour interval is the space between contours lines, the closer the lines the steeper the slope, hachure lines indicate a depression or hole, when a line crosses a body of water it points uphill, sea level is 0, lowest elevation ends with a 1 and highest elevation ends with a 5 or 9.



65. A profile is a side view of a contour map.

66. As you increase elevation or altitude, air pressure decreases.



LIFE SCIENCE

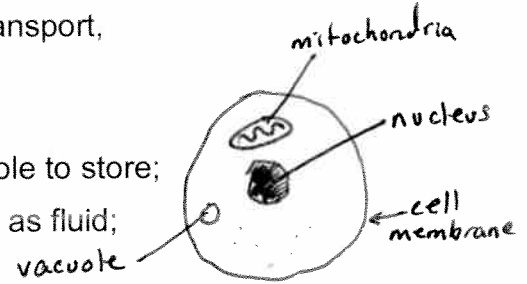
1. Cells are the basic unit of living things:

cells → tissues → organs → systems → organisms.

2. Organisms must carry out the following life processes: nutrition, transport, respiration, excretion, regulation, reproduction, and growth.

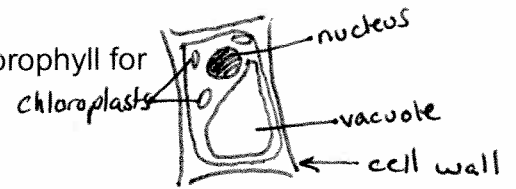
3. All cells have the following organelles:

nucleus to controls activities; mitochondria to give energy, vacuole to store; cell membrane to control what gets in and out of cell, cytoplasm as fluid; ribosome to make proteins.



4. Only plant cells have the following organelles:

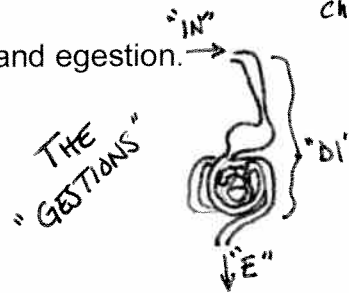
Cell wall for supports and chloroplasts – which contains chlorophyll for photosynthesis.



5. Nutrition consists of ingestion, digestion and egestion.

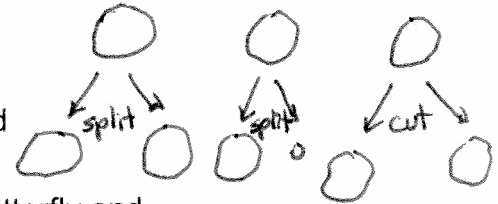
6. The following nutrients are important:

- proteins – growth and repair
- carbohydrates - quick energy,
- fats and oils – stores energy
- vitamins and minerals – assists in the life processes.



7. Sun is the main source of energy for plants, animals and humans.

8. Three types of asexual reproduction are: binary fission, budding, and regeneration.

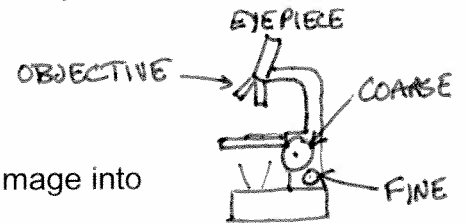


9. *Metamorphosis is the life cycle* of organisms such as the frog, fly, butterfly and humans.

10. A compound microscope uses two lenses to view small objects.

Eye piece X objective lens = total magnification.

11. The coarse knobs moves image into view and the fine knob brings image into focus.



12. A stain is used to see clear objects in the field of view.

13. Cancer is abnormal cell division.

14. A response to a stimulus is the way we respond to a change.

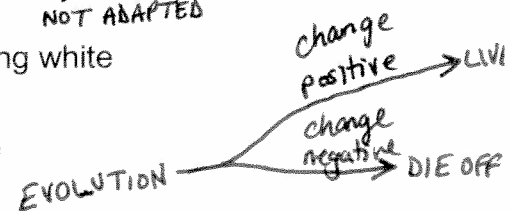
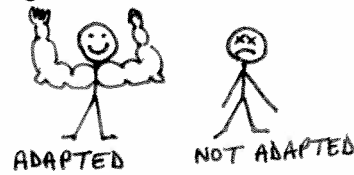
15. Responses can be involuntary.

16. Physical adaptations enable us to survive.

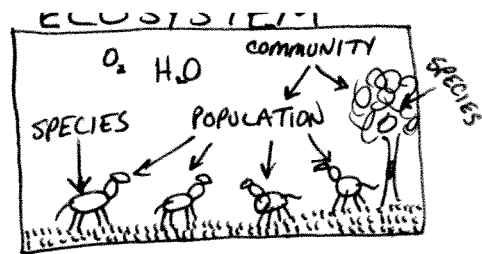
ex. birds having hollow bones or owls seeing at night.

17. Animals adapt to their environment or habitat like a polar bear having white fur or cactus with waxy skin.

18. Changes in an organism's environment can cause them to become endangered or extinct.



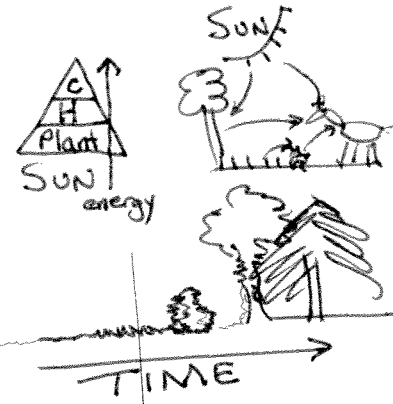
19. An ecosystem is where living and non-living interact. Sun = source.
 Species → population → community → ecosystem.



20. Organisms get energy from the food they eat.

- Producers are plants
- Consumers eat producers.
- Herbivore eats plants,
- Carnivores eats animals
- Omnivore eats plants and animals.

21. More than one food chain makes a food web. Food pyramid shows energy being passed with plants/ most energy on bottom.



22. The three symbiotic relationships are mutualism, commensalism, and parasitism.

23. An ecological succession is when one community is replaced with another until climax community is achieved.

24. Renewable resources (can be recycled) water, solar, wind, and soil.

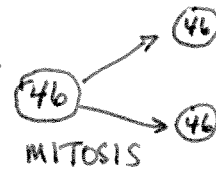
Non-renewable resources (can't be recycled) fossil fuels ex. Coal, oil, gas

25. Living things are classified based upon their properties.

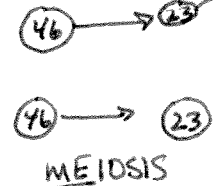
- King Phillip came over from Great Spain
- Kingdom → Phylum → Class → Order → Family → Genus → Species.
- The further you go down the groups, the more they have in common or are related.

26. Two types of cell division are asexual and sexual reproduction.

27. Mitosis – cell division with same number of chromosomes.



Meiosis – cell division with half the number of chromosomes.



28. Sperm + egg = zygote through fertilization.

Zygote → embryo through cleavage and differentiation.

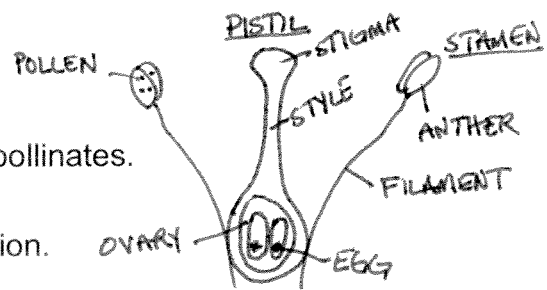


29. Female parts of the flower: pistil → stigma + style + ovary-egg

Male parts: stamen → anther + filament and pollen (sperm)

30. Pollination – when pollen fertilizes the egg.

- Self-pollination – flower has both male and female parts-self pollinates.
- Cross-pollination – flower pollinates another flower.



31. Seed dispersal spreads the seeds by wind, animal, and explosion.

32. A trait is determined by the genetic material on your genes.

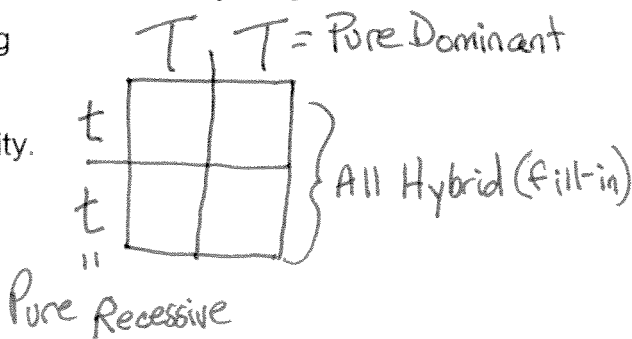
Dominant – trait that is showing

Recessive – not showing.

Punnet square shows probability.

Pure – same TT or tt

Hybrid – Tt



33. Evolution causes great variety of living things.

ex. natural selection, genetic engineering, mutations, genetic diseases.

34. The skeletal system supports the body. Consists of bones, cartilage, joints, ligaments – bone to bone and tendons – bones to muscle.

35. Muscular system – moves organs and body parts.

Voluntary - you control ex: walking.

Involuntary – no control. ex: heart beating

36. Regulatory consist of both nervous and endocrine together.

37. Nervous system – controls body activities. It contains the brain, spinal cord, nerves and sense organs. Neurons are nerve cells. Sensory and motor neurons.

38. Endocrine system regulates body activities with hormones secreted by the glands.

39. Digestive system breaks down food. It contains the digestive tract and the accessory organs – pancreas, gall bladder, and liver.

40. Two types of digestion are physical and chemical digestion.

41. Digestive juices: mouth – saliva, stomach – gastric juice and HCl, small intestine – intestinal juice, pancreas – pancreatic juice and liver – bile.

42. Circulatory system transports materials. It consists of heart and blood vessels.

43. Blood vessels: arteries – carry blood away from the heart

veins carry blood to the heart

capillaries connect arteries to veins and is the place of gas exchange.

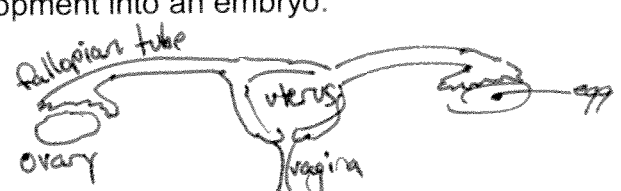
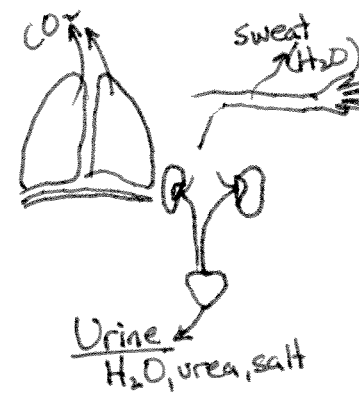
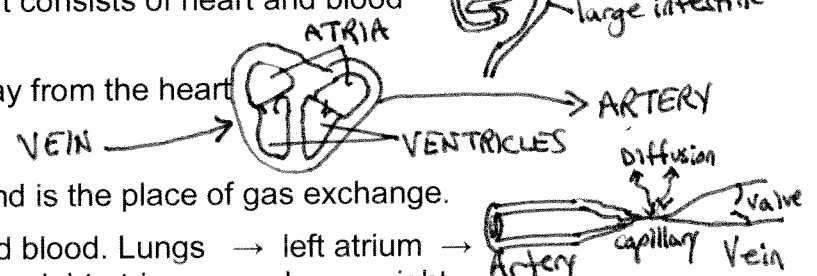
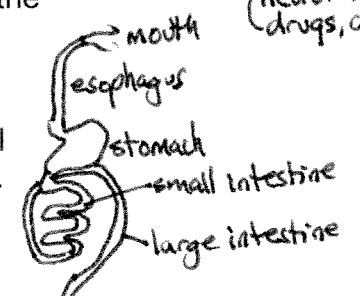
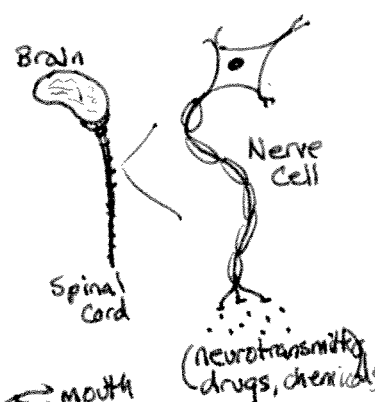
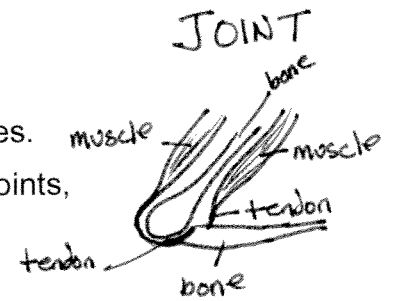
44. Left side of the heart gets the oxygenated blood. Lungs → left atrium → valve → left ventricle → rest of body → right atrium → valve → right ventricle → lungs.

45. Respiratory system exchanges gases with the environment. It contains the respiratory tract to your lungs which end in air sacs. Gas exchange takes place between sacs (alveoli) and capillaries.

46. Excretory system removes wastes from the body. It contains the lungs, skin, kidneys – makes urine and liver- makes urea.

47. Reproductive system produces offspring. Males testes makes sperm and testosterone and female ovaries makes eggs and estragon.

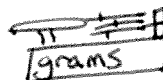
48. Fertilization takes place in the oviduct, then it is dropped into the uterus for development into an embryo.



PHYSICAL SCIENCE

1. Matter is anything that has mass and takes up space.

2. Mass is the amount of matter in an object.

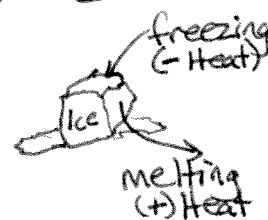


3. Volume is the amount of space an object takes up.



4. The 4 phases of matter are solid, liquid, gas and plasma.

5. The phase changes are melting and evaporation (where it gains heat) and condensation and freezing (where it loses heat).



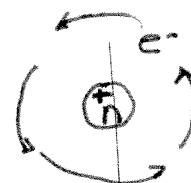
6. Elements are the basic building blocks of matter.

7. An atom is the smallest particle of an element.



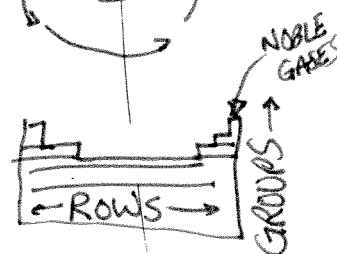
8. A compound is two or more elements. Each element in a compound gets a capital letter. Ex: H₂O

9. The parts of an atom are protons (+), electron (-), and neutron (no charge - neutral).



10. Protons and neutrons are found in the nucleus and the electrons are found moving around the outside of the nucleus.

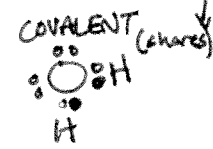
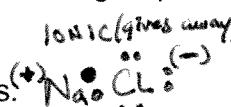
11. Elements are organized by their properties on a periodic table. Groups are the vertical columns and rows are the horizontal columns.



12. Metals are on the left side and non-metals are on the right side. They are separated by a staircase of metalloids. Noble gases are the last group.

13. The smallest part of a compound is called a molecule.

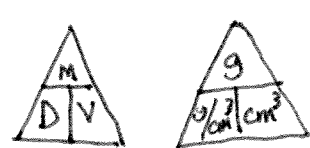
14. Molecules are bonded together by ionic and covalent bonds.



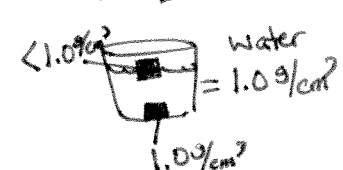
15. Mixtures are when two or more substances are put together and do not make a new substance. Ex: Salt water

16. A Solution is an undisturbed mixture. The two parts of a solution are solute (gets dissolved) and solvent (does dissolving).

17. Density is mass divided by volume. The density of water is 1 g/cm³. If an object has a density more than 1 it will sink and if less than 1 it will float, called buoyancy.



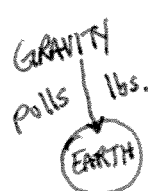
18. Physical changes alter the size and shape but remains the same substance. Chemical change creates a new substance.



19. Chemical change is represented by a chemical equation. The starting materials (reactants) are on the left and the final materials (products) are on the right. Change = → Ex: C + O₂ → CO₂

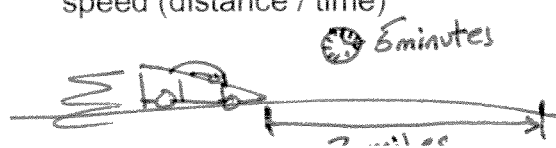
20. The law of conservation of matter states that matter can not be created nor destroyed, only changed from one form to another.

21. A force is a push or pull.



22. Weight is the amount of gravitational pull on an object.

23. The 3 ways to describe the motion of an object are speed (distance / time)



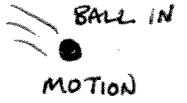
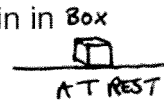
$$\text{Speed} = \frac{2 \text{ mi}}{5 \text{ minutes}}$$

velocity (distance / time with a direction)

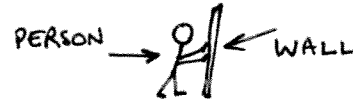
acceleration (final velocity – starting velocity / time).

24. Newton's laws of motion:

- 1st – an object at rest will stay at rest and an object at motion will remain in motion, unless an outside force acts on the object-inertia
- 2nd - Acceleration = Force / Mass or Force = Mass X Acceleration
- 3rd – For every action there is an equal and opposite reaction



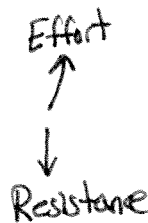
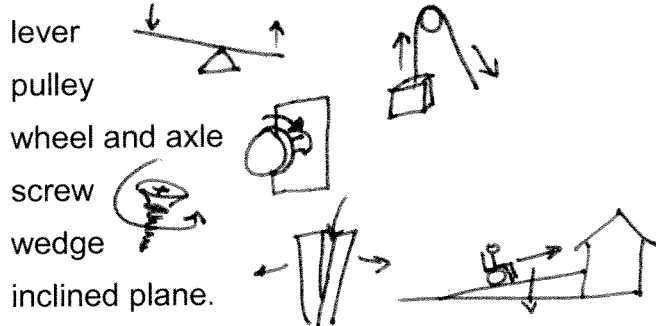
25. Work = Force X Distance.



26. A machine transfers mechanical energy.

27. The resistance is the force it must overcome and the effort is the force applied. Fulcrum is the pivot point.

28. The six simple machines are:

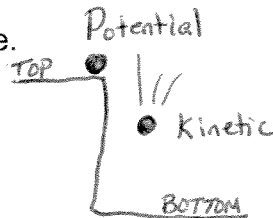


29. Friction reduces the efficiency of a machine.

30. Energy is the ability to do work.

Potential energy – stored energy

Kinetic energy – energy of motion.



31. The five forms of energy are: chemical, nuclear, heat, electrical, and light.

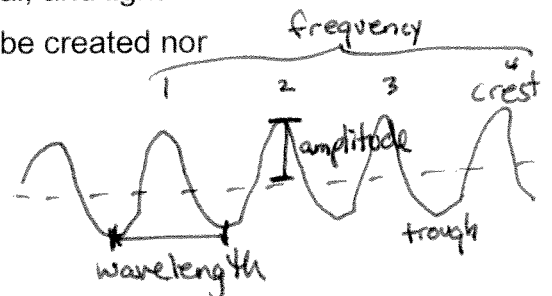
32. The law of conservation of energy states that energy can not be created nor destroyed, only changed from one form to another.

33. Light and sound travel in forms of waves.

34. Wavelength is the distance from crest (top) to crest or trough (bottom) to trough.

Amplitude – is the height of the wave.

Frequency – number of waves that pass a given point in a certain time.



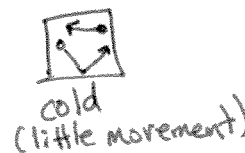
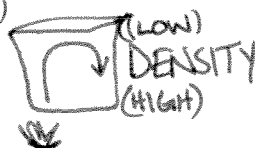
35. The three types of waves are transverse, longitudinal, and compression.

36. Heat is produced by vibrating molecules. The more heat that is added, the faster it moves. The addition of heat causes expansion and the lose of heat causes contraction. Heat travels from warm to cold.

37. The three ways heat moves:

radiation – space

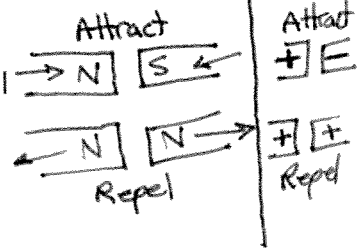
convection – fluid (liquid or gas)



conduction- touching molecules (solid)

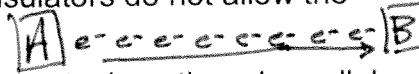


38. The law of magnetic poles states that like poles will repel and unlike poles will attract. The closer the distance, the stronger the pull.

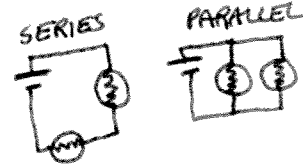


39. The law of electric attraction and repulsion states that items with like charges repel each other and items with unlike charges attract each other.

40. Electricity is produced by the flow of electrons from one point to another. Conductors allow electricity to flow through it. Insulators do not allow the electricity to flow through it.

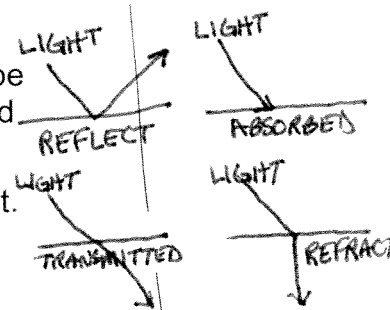


42. The two types of electric circuits are: series circuit - single path and parallel circuit - two or more paths. If one bulb blows out, the series circuit dies and the parallel circuit still works.



43. Sound is produced by a vibrating object. The speed of sound depends on the density of the substance. The denser, the faster it moves. Sound travels faster through solids.

44. Light is a visible form of energy that travels in paths called rays. Light can be reflected (bounced off), absorbed (taken in and transferred), or transmitted (go right through).



45. Refraction is the bending of light. Ex: A pencil in a glass of water looks bent.

46. Dark colors and rough surfaces absorb more light.



47. Concave lens curves inward and a convex lens curves outward.

48. Electromagnetic spectrum shows the frequency and wavelengths of light waves. The longer the wavelength, the less harmful they are.



49. A calorie is the unit for measuring energy in food and fuel.

50. A watt is the rate at which energy is used over a period of time.

51. Hydroelectric energy is electricity produced by the power of flowing water.

Ex: Niagara Falls

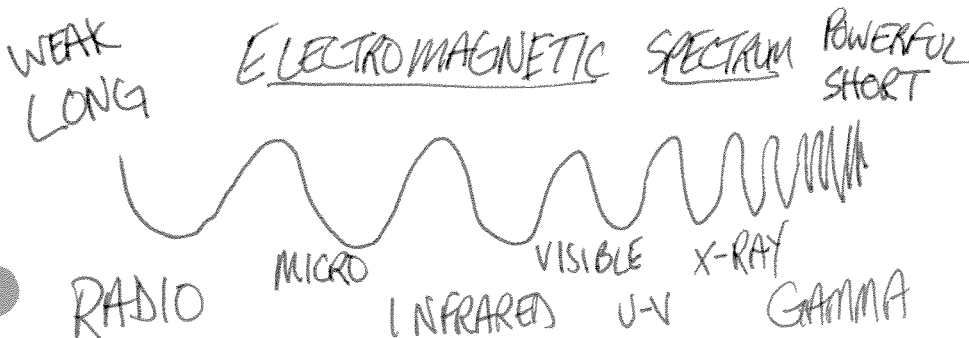
52. Nuclear energy is energy stored in the nucleus of an atom.

Ex: splitting uranium releases heat energy. It creates thermal pollution and nuclear waste.



53. Problems with fossils fuels: pollution, acid rain, lung disease, oil spills, and the greenhouse effect.

54. Conservation means the saving of natural resources through wise use.



MISCELLANEOUS