Name_____Date_____Hr._____

Final Exam Study Guide

1. Describe and explain the three types of heat transfer. Make sure to give an **example** of each type of transfer.

Type of Heat Transfer	*Define*	*Example*
radiation	**Energy transferred by rays or waves.**	**The sun's rays hitting the Earth.**
conduction	**Transfer of energy that occurs when molecules bump into each other.**	**Metal pan getting hot on a stove.**
convection	**Transfer of heat by flow of material.**	**How an oven heats up, the water in a pot boils, how the atmosphere is heated.**

2. Explain how heat is transferred in the troposphere.
   Convection, it circulates the heat through the atmosphere.

3. Explain the process of convection.
   It takes place because warm air or water is less dense then cold air or water. In the atmosphere, as the air heats up it rises until it begins to cool, and then it will sink. Cool air/water is more dense and flows under the warm air/water.

4. Compare and contrast global winds and local winds.

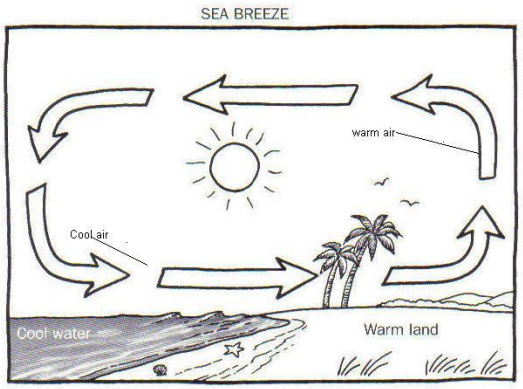
Global Winds | Local Winds

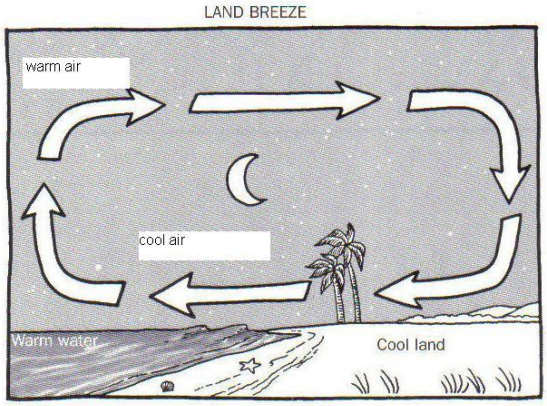
- **Global winds are caused by the Coriolis effect and are always blowing in the same direction.**
- **Determines major weather patterns**

- **All winds are caused by differences in air pressure.**

- **Local winds are caused by small wind systems such as sea and land breezes.**
- **Affect local weather.**

5. Draw and label a diagram of a sea breeze and a land breeze. Also, explain WHY each type breeze occurs.

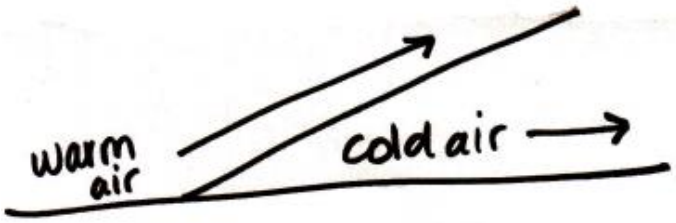
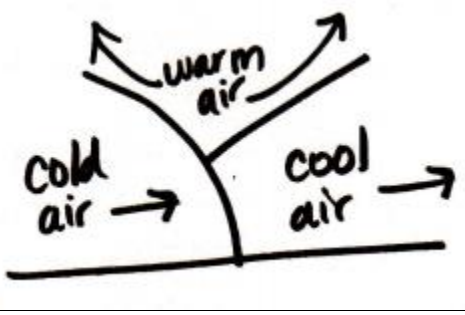
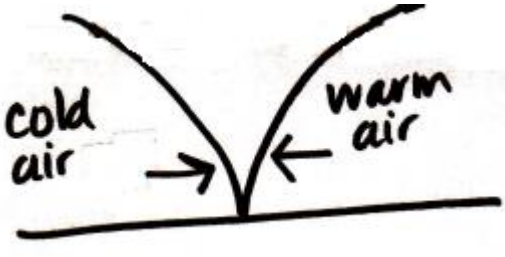




Is created during the day because solar radiation warms the land more than the water. Air over the land is heated, rises, and moves over the ocean. A convection current results because air over the ocean is cooler, more dense and moves toward the land.

Is created at night when the land cools faster than the ocean water. Air over the land becomes cooler than air over the ocean. Cooler, denser air over the land moves toward the water, as the warm air over the water rises and moves toward the land.

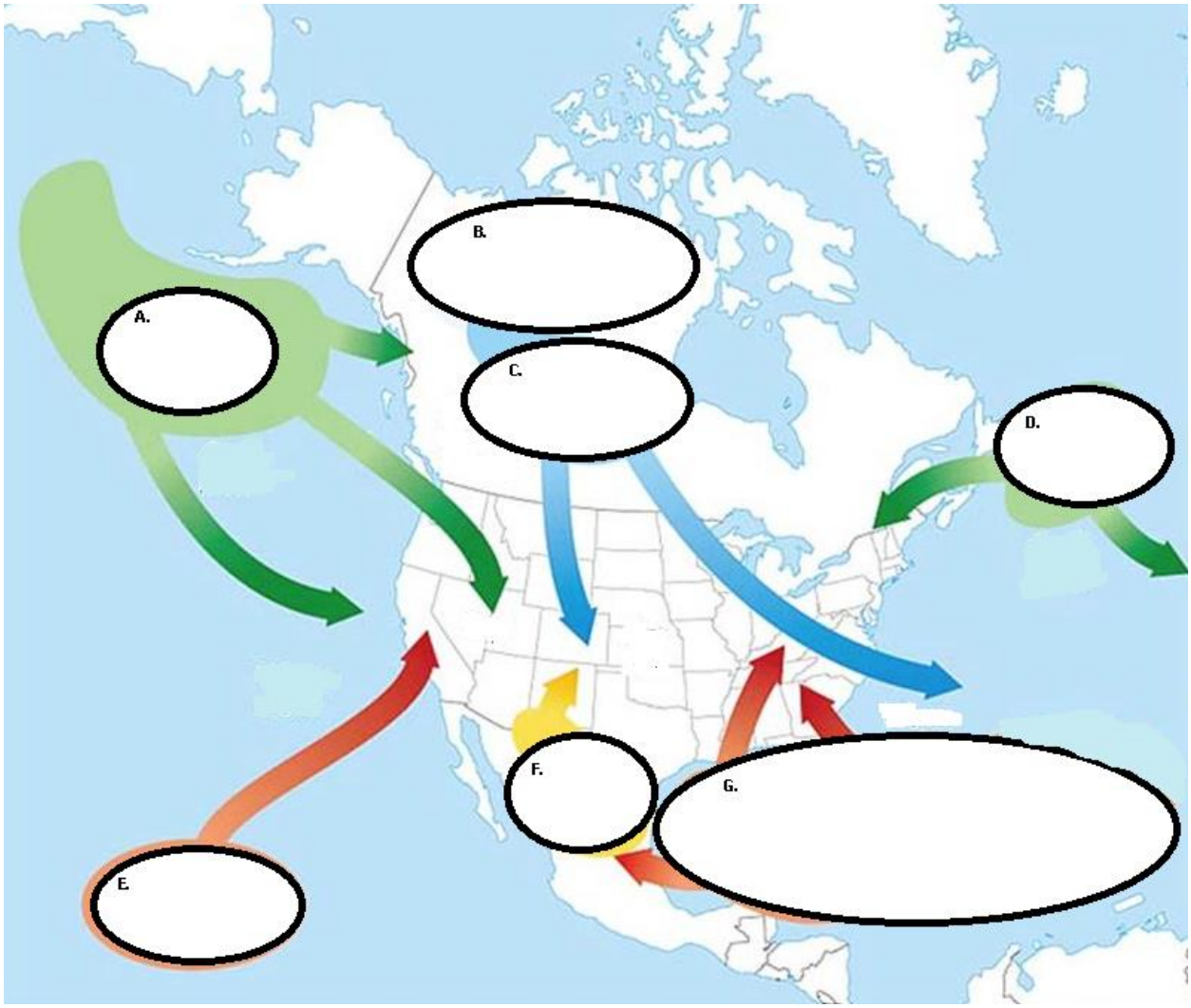
6. Complete the chart and describe each type of front (cold, warm, stationary, and occluded). Explain what type of weather would occur with each.

Type of Front	Definition	Picture/Sketch	Type of Weather that Occurs
cold	**A situation where a cold air mass advances upon a warm air mass. The cold air wedges under the warm air and the warm air rises and condenses quickly causing clouds.**		**big thunderstorms in summer; snowfalls in winter, possible tornadoes, high winds, followed by fair, cooler weather**
warm	**A situation where a warm air mass advances upon a cold air mass. This happens more slowly. As the warm air advances over the cold, the air cools and condenses causing clouds.**		**steady long lasting rains in summer; steady snowfalls in winter, very overcast, drizzle, fog, followed by warm, humid weather**
occluded	**Occurs when warm, cool, and cold air masses come together; warm air gets closed off from the surface of the Earth**		**cool weather, light rain or other precipitation**
stationary	**Occurs when cold air mass and warm air mass meet and neither takes over the other (neither one advances)**		**gentle to non-existent winds, stagnant, unchanging temperatures, light rain, many days of almost continuous precipitation**

Also, explain WHY that type of weather would occur.

Front	***Explanation of why the weather would occur***
Cold	A fast moving cold air mass that overtakes a warm air mass. Since cold air is denser than warm air, cold air undercuts a warm air mass. The cold air pushes the warm air up rapidly because the warm air is less dense. As the warm air rises, the water vapor condenses and forms storm clouds.
Warm	A slow moving warm air mass that overtakes a cold air mass. Since warm air is less dense than cold air, it rises above the retreating cold air. This creates a gentle sloping boundary between the two air masses. As the warm air rises, the water vapor condenses and forms layers of clouds.
Stationary	A warm air mass and a cold air mass meet and neither one is moving fast enough to overtake the other. The boundary between these masses stops moving. Some of the moisture in the warm air condenses and creates clouds. It can stay in place for several days
Occluded	A cold air mass moves toward a cool air mass with a warm air mass in between them. The cold air forces the warm air up. The warm air becomes closed off from the surface of the Earth. The moisture in the warm air condenses and creates clouds.

7. Label letters A-G on the diagram with the type of air mass and characteristics of each air mass. For example: Maritime polar brings cold and moist air.



Letter	Name of Air Mass	Type of Air/Weather
A	**Maritime Polar**	**Moist/cold**
B	**Continental Arctic**	**Dry/Very cold**
C	**Continental Polar**	**Dry/cold**
D	**Maritime Polar**	**Moist/Cold**
E	**Maritime Tropical**	**Moist/Warm**
F	**Continental Tropical**	**Dry/Hot**
G	**Maritime Tropical**	**Moist/Warm**

8. Complete the chart

Type of Pollution	*Definition*	*Causes*	*Effects*
Water pollution	**The addition of any substances that has a negative effect on the water or living things that depend on the water.**	**sewage, industrial wastes, agricultural runoff, runoff from roads, oil spills.**	**birth defects, cancers, irritated skin, overgrowth of algae or plants in ponds due to runoff, animals and plants killed, makes the water undrinkable.**
Air pollution	**Any chemical that is released into the air by natural (forest fires) or human activities. The presence of any harmful substance in the air.**	**car exhaust, motor vehicles which is the biggest source, power plants, home furnaces, carbon monoxide, CFCs. toxic pollutants.**	**smog; acid rain from the burning of coal, oil and gasoline; eye irritation and breathing difficulties; ozone depletion.**

9. List several solutions to reduce pollution.
   Use sand on roads instead of salt, farmers collect run-off to use for irrigation, sewage treatment plants clean up water, use cars less often, use more public transportation, use clean energy.

10. Complete the chart.

Word	*Definition*	*Example*
Atom	**Smallest particle of an element.**	***Sodium***
Element	**A substance composed of atoms that CANNOT be broken down into other substances by chemical or physical means.**	***Oxygen***
Compound	**A substance made of two or more elements that can be chemically combined.**	***H_2O (water)***

11. Describe how the periodic table is organized. (remember to explain groups, periods, and atomic #)
    It is organized by atomic # which is the # of protons each elements nucleus contains. The atomic # increases from left to right. Also, all elements in the same GROUP have similar properties and react similarly. You can predict an element's properties by looking at its location on the periodic table. The elements in the same PERIOD get LESS reactive as you move from left to right.

12. Fill in the blanks on the chart with the correct information.

Atoms of Some Common Elements

Element	Atomic Number	Mass Number	Protons	Neutrons	Electrons
Boron	**5**	**11**	**5**	**6**	**5**
Fluorine	**9**	**19**	**9**	**10**	**9**
Potassium	**19**	**39**	**19**	**20**	**19**
Chlorine	**17**	**35**	**17**	**18**	**17**

13. Describe the properties for Groups #1, 11, 17, and 18.

Group 1--- Reacts VIOLENTLY with water; they are alkali metals, soft and shiny.

Group 11---All react with water slowly or NOT at all, transition metals.

Group 17--- Reacts VIOLENTLY with group #1, halogens, nonmetals, most are dangerous to humans.

Group 18--- Inert, they DO NOT or rarely react, called noble gases, they do not form compounds. They are chemically stable, they can't lose or share electrons, exist in small amounts.

14. Define physical properties and chemical properties. Give several examples of each.

Type	*Definition*	*Examples*
Physical Properties	**Properties that can be observed or measured without changing the composition of matter.**	**boiling point, melting point, freezing point, density, color, smell, magnetic attraction, viscosity, opacity.**
Chemical Properties	**Properties that describe a substance's potential to undergo a chemical change or reaction.**	**reactivity, flammability, toxicity, combustibility, ability to corrode, pH.**

15. Define physical and chemical change. Give two examples of each.

Type	*Definition*	*Examples (two)*
Physical Change	**Change in state; alters the FORM of a substance but DOES NOT change it to another substance.**	**melting ice, boiling water, freezing water, salt dissolving, paper ripping, etc.**
Chemical Change	**A substance is changed into a NEW substance (a chemical reaction occurs).**	**burning paper, baking a cake, cooking an egg, etc.**

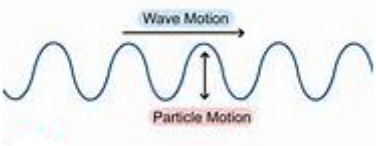
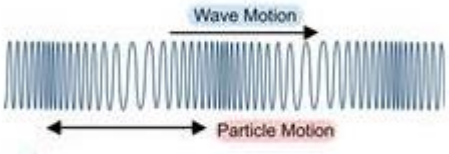
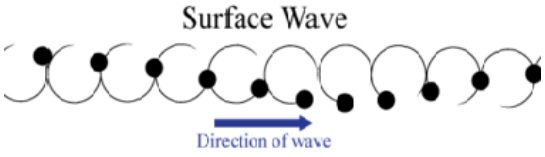
16. What evidence would you look for to identify that a physical change has taken place?

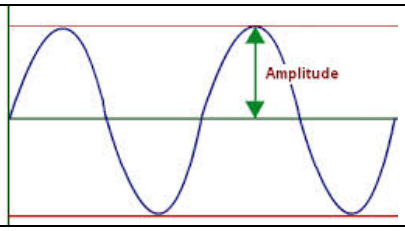
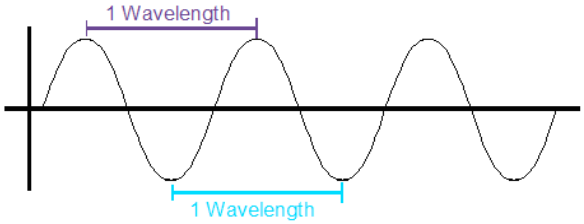
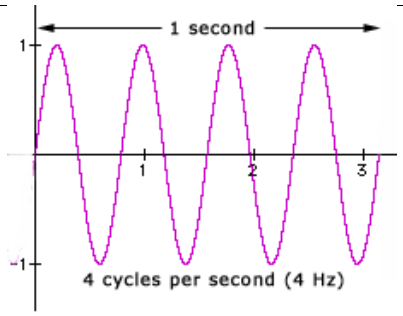
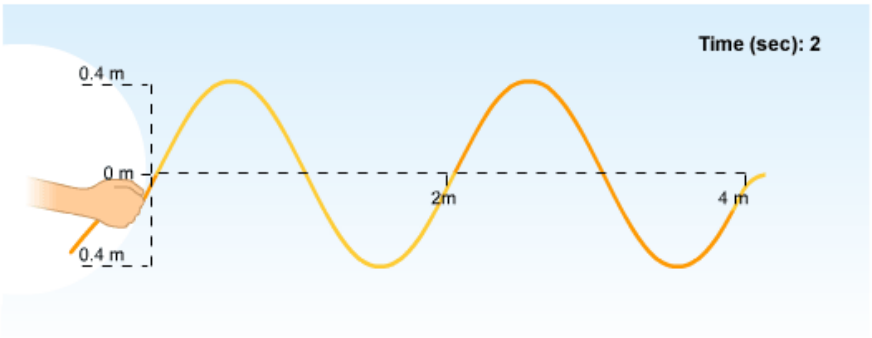
When the substance changes form or state, has no change in chemical composition, no new substance is created----for example: freezing water into ice, melting ice into water, mixing kool-aid into water

17. What evidence would you look for to identify that a chemical change has taken place?

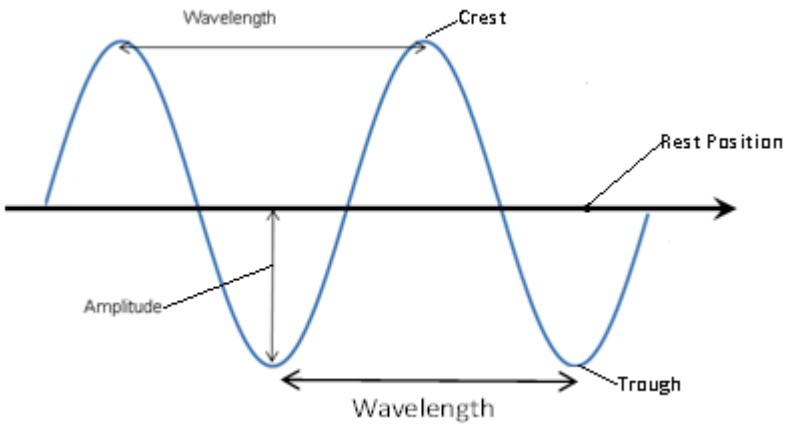
Substances combine or break apart to form a new substance
When a new substance is formed. (For example: ash is formed after burning paper)
Color change
Temperature change
Gas formation
Production of heat or light
Solid formation (not a phase change)

18. Define and draw a picture of the following terms:

Word	*Definition*	*Picture*	*Examples*
Transverse wave	***Wave that moves the medium at right angles to the direction in which the wave is moving.***		***waves in a rope, seismic waves, light waves***
Longitudinal wave	***Wave that moves the particles of the medium in the same direction as the wave is traveling.***		***sound waves, waves in a slinky***
Surface wave	***A combination wave that combines transverse and longitudinal waves.***		***ocean waves***

Word	Definition	Picture
amplitude	***The maximum distance that a wave travels from the rest position.***	
wavelength	***The distance between two corresponding parts of a wave.***	
frequency	***Number of complete waves that travel past a given point in a certain amount of time.***	
speed	***The speed at which a wave travels can be found by S= Wavelength X Frequency.***	

19. Label all parts of the wave below with the corresponding term.



20. Define the following terms:

Reflection—when an object or wave hits a surface through which it can't travel and bounces back.

Refraction—when a wave moves from one medium to another at an angle, it changes speed as it enters the second medium, which causes it to bend.

Diffraction—when a wave passes a barrier, or moves through a hole in a barrier it bends and spreads out.

Interference— an interaction that occurs when two or more waves meet

Resonance—occurs when vibrations traveling through an object match an objects natural frequency.

21. Explain how a sound wave travels through air.

The sound wave's energy passes from air particle to air particle. The air particles vibrate in place and do not move out of position.