Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Central Dauphin School District

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Final Exam Study Guide ANSWER KEY

Unit 7

**For questions 1-11** select from the following choices (you may have more than one

selection for some answers):

**A. proton B. neutron C. electron**

\_\_\_A\_\_ 1. The atomic number equals the number of \_\_\_\_\_\_\_\_\_\_.

\_\_\_\_B\_ 2. The mass number minus the atomic number equals the number of \_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_A,B\_ 3. Included in the mass number

A\_\_\_\_\_ 4. Positive charge

\_C\_\_\_\_ 5. Negative charge

\_\_B\_\_\_ 6. Neutral charge

\_\_\_C\_\_ 7. Located around the outside of the nucleus

\_\_A,B\_\_\_ 8. Located inside the nucleus

\_A,B\_\_\_\_ 9. Have about the same mass

\_B\_\_\_\_ 10. Determines the variety of isotopes for any element

\_\_A\_\_\_ 11. The number of this particle is unique for any given element

12. How can you determine the number of valence electrons for any A group element?

\_\_\_\_A Group numbers tells you valence number \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. What is the charge of the cation in the ionic compound potassium oxide (K2O) ? What is the charge of the anion?

\_\_\_\_\_1+, 2-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. How is an ionic bond formed? \_\_electrons are transferred from the cation to the anion\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. What is the overall ionic charge of a balanced ionic compound? \_\_\_\_0\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. Which pair of elements are more likely to form an ionic compound: phosphorus and sulfur **or** sodium and iodine? How do you know? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Sodium and iodine- opposite sides of periodic table. Sodium is a metal and iodine is a nonmetal\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17. What is a full octet? Which group has one? \_\_\_\_when highest energy level is filled with electrons and there are no empty orbitals. Group 8A, the nobel gases has a full octet\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. Why do some atoms share electrons and others give/take electrons? \_\_\_they need to have a full octet so they either share or transfer in order to do this. Typically it has to do with electronegativity and ionization energy. A very electronegative atom will easily take an electron from a atom with high ionization energy- IONIC. If the electronegativitiy and ionization energy are relatively similar the electrons will be shared- COVALENT\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. How do you make a Lewis Dot structure for ionic compounds and covalent molecules? \_\_in ionic compounds the electrons are transferred and in covalent the drawing must show that they are being shared.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. Which elements have the highest electronegativity? \_\_\_\_\_7A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

21. How is electronegativity related to polarity? Use a water molecule as an example. \_\_If one atom in a covalently bonded molecule is more electronegative, the electrons will be shared unequally. This creates a slightly negative charge on oxygen and a slightly positive charge on the hydrogens, thus resulting in a polar molecule\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. How are biological macromolecules formed? Why are they important to living organisms? \_\_\_\_\_\_they are formed between smaller monomers or subunits being covalently bonded over and over. They perform a variety of functions in all living things from being structural molecules, to providing energy, to storing genetic information\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 8

Fill in the sentences below using the word banks provided. **Words may be used once, more than once, or not at all.**

**acid(s) atoms base(s) chemical composition compounds elements**

**heterogeneous homogeneous hydrochloric acid largest metals mixture physical**

**size sodium bicarbonate smallest suspensions viscosity**

1. Substances that cannot be broken into simpler substances and are only made of one type of atom are

\_\_\_\_elements\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. Substances that have atoms of the same or different elements that are joined in a fixed proportion and can be

broken down into simpler substances are \_\_\_\_compounds\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. \_\_\_atoms\_\_\_\_\_\_\_\_\_\_ are the building blocks of all matter.

4. When materials are put together in different ratios so that the properties vary a \_\_\_\_\_\_mixture\_\_\_\_\_\_\_\_\_\_\_\_\_ is

formed.

5. Solutions, suspensions and colloids can be classified by the size of their \_\_\_\_largest\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

particles.

6. Mixtures that appear to be made of one type of material are called \_\_\_\_\_homogenous\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mixtures;

while those that appear to be made of many types of materials are called \_\_\_heterogeneous\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

mixtures.

7. \_\_\_\_\_\_metals\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are substances which are malleable and conduct electricity and heat.

8. Maple syrup, honey, corn syrup and oil are materials that have a high \_\_\_\_\_viscosity\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

9. \_\_\_\_\_suspensions\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are mixtures that have particles that will settle to the bottom.

10. When a pencil is sharpened, a piece of wood is sawed, or a paper is torn a \_\_\_physical\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

change occurs. During this type of change the \_\_\_\_\_\_\_\_\_composition\_\_\_\_\_\_\_\_\_\_\_ of the material does not change.

11. \_\_\_\_\_\_acids\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have a pH below 7 while \_\_\_\_\_\_bases\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have a pH above 7 to 14.

12. \_\_\_\_hydrochloric acid\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an example of an acid and \_\_\_\_sodium bicarbonate\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an example of a base.

\*\*\*Know three indicators of chemical changes and examples of each.

\_\_\_\_\_\_\_smell, color change (rust)

Formation of a precipitate, gives off heat, gets cold, fizzing/bubbles (formation of a gas)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*Know the properties and structure of water and how to explain why they are important to living things.

\_\_polar molecule, freezes at 32 F or 0 C, boils at 100 C or 212 F, becomes less dense at freezing and therefor floats- important to aquatic organisms because top layer of water is what freezes and it insulates the water underneath and keeps organisms alive\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*Know how to neutralize an acidic or basic solution. \_\_\_\_\_\_if its acidic, add a base, if its basic add an acid\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 9**

**Terms to know:**

Ecology -the branch of biology that deals with the relations of organisms to one another and to their physical surroundings.

Population - all the [organisms](http://en.wikipedia.org/wiki/Organism) of the same group or [species](http://en.wikipedia.org/wiki/Species), which live in a particular [geographical area](http://en.wikipedia.org/wiki/Geographical_area), and have the capability of interbreeding

Community - an assemblage of interacting populations occupying a given area.

Ecosystem - a community of living organisms in conjunction with the   
nonliving components of their environment (things like air, water and mineral soil)

Biosphere – is the global sum of all [ecosystems](http://en.wikipedia.org/wiki/Ecosystem).

Niche - the position or function of an organism in a community of plants and animals.

1. **Examples of Abiotic Factors: \_rocks, gases, pollutants,water\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. **Examples of Biotic Factors: any living organism\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **Order of Ecological Levels from SMALLEST to LARGEST**

**\_\_population\_\_\_\_\_\_\_\_\_\_\_** 🡪 **\_\_\_\_\_community\_\_\_\_\_\_\_\_\_\_** 🡪 **\_\_\_\_ecosystem\_\_\_\_\_\_\_\_\_\_\_\_\_\_**🡪 **\_\_\_\_biome\_\_\_\_\_\_\_\_\_\_\_\_**🡪**\_\_\_biosphere\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_**

1. **Other names for Producers :** \_\_chemoautotroph, photoautotroph \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. **Original Source of Energy for Ecosystems** = \_\_\_\_\_SUN\_\_\_\_\_\_\_\_\_\_\_\_\_
3. **Examples of:**
   1. Producer – \_\_Plant\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Primary Consumer – rabbit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Secondary Consumer – \_coyote\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Tertiary Consumer – \_human\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. Detrivore – \_\_turkey vulture\_, earthworm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. Decomposer – \_\_\_\_\_bacteria\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. **Why are decomposers always at the end of a food chain/web?** \_everything dies and must be decomposed after life\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. **Energy Pyramids and trophic levels:**
   1. What is at the base of the energy pyramid and WHY: \_\_\_\_\_\_\_producers, they provide all the energy for higher trophic levels since those things cant access energy directly from the sun\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. What is at the top of the energy pyramid and WHY: \_\_top level consumers-there aren’t that many because by the time the energy is passed through several trophic levels, there is very little available. Numerous top level consumers are not sustainable.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. What does most of the energy from food get used for?: \_\_\_reproduction\_\_\_\_\_\_\_\_\_\_\_\_, \_\_movement\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_respiration\_\_\_\_\_\_\_\_\_
   4. How much energy is passed to the next trophic level? \_\_\_\_\_\_\_\_10 %\_\_\_\_\_\_\_\_\_\_
   5. Does ENERGY get recycled? \_\_\_\_\_\_\_NO\_\_\_\_\_\_\_
6. **Water Cycle : Processes involved: \_\_\_\_\_\_\_transpiration, evaporation, runoff, precipitation, condensation, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
7. **Carbon Cycle:** Reservoirs are \_places it is stored\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Examples of reservoirs: \_\_\_\_\_limestone deposits,atmosphere, ocean\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Processes involved: \_\_\_photosynthesis, respiration, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Nitrogen Cycle:** 
   1. Nitrogen fixation- \_\_N2 to NH4\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Nitrification - \_\_NH4 to NO2 and NO2 to NO3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Role players in cycle: \_\_\_bacteria\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_animals\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_plants\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Greenhouse Effect:**

Caused by: \_\_\_Atmospheric gases, notably CO2, trapping radiant heat from sun’s rays\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 10**

**Vocabulary to know:**

Carrying capacity - the maximum, equilibrium number of organisms of a particular species that can be supported indefinitely in a given environment.

Competition/Predation – attempting to gain resources over another individual from a different or same species for personal sustainability , a relation between animals in which one organism captures and feeds on others.

Density Dependent Factor – resources that are limited due to the amount of individuals of a species in a given area

Exponential Growth - development at an increasingly rapid rate in proportion to the growing total number or size; a constant rate of growth applied to a continuously growing base over a period of time

Limiting factor - an environmental factor that tends to limit population size.

Niche - the position or function of an organism in a community of plants and animals.

Population - all the individuals of one species in a given area.

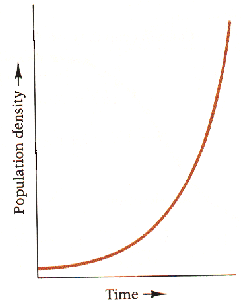
Population Density - the number of organisms of a given species living per unit of an area (e.g. per square mile); the number of organisms of a given species relative to the space occupied by them

Succession/primary and secondary – Primary the development of plant and animal life in an area without topsoil; the development of biotic communities in a previously uninhabited and barren habitat with little or no soil

Secondarythe development of plant and animal life in an area that has undergone some kind of natural disaster (ie forest fire) and still has soil available.

Symbiosis – a relationship between different species where individuals of the species live closely together and perform some role for the other

**Population Graphs**



What type of graph is shown? \_\_\_Line graph\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What does it mean to say it is exponential growth? It grows at a constant rate over given intervals

What are the few factors that would limit growth? Food, water, shelter

What type of graph is shown? \_\_\_\_line graph\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What range of amounts of yeast represent exponential growth?0-3.5 mg/cc

At what amount is the birth rate = death rate? 6.25 mg/cc

What environmental factors may have acted to decelerate (slow) growth? Amount of foodavaiable

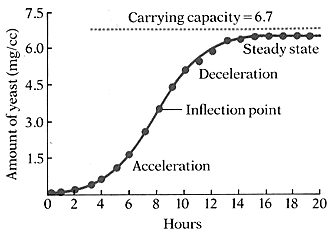
The line marked A is showing a yeast population grown at the same time but not in the same environment. How are the graphs the same? Same shape just with lower amounts of yeast in a shorter time frame

a.

b.

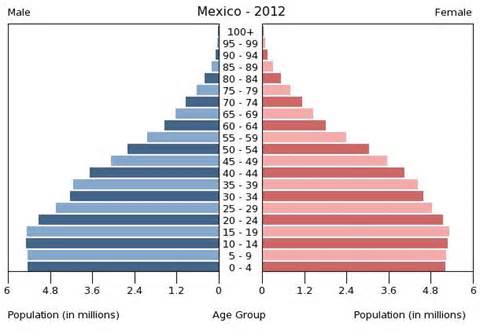
What may have caused the A yeast to not grow in the same way?

a. more space available b.more food available



**A**

**A**



What comparison is this graph making? Population densities of males and females of various age groups

What predictions can you make about Mexico’s population from this graph?

a. short life span

b. rapid growth

c. high birth rate

A Hawaiian volcano just erupted. It was part of the National Park system. In the table below list the succession of the park. Identify the types of species that would appear at stage.

|  |  |  |
| --- | --- | --- |
| One year after eruption | 3 years after eruption | 5 years after eruption |
|  |  |  |
|  |  |  |
|  |  |  |
| XXXXXXXXXXXXXXXXXXXX |  |  |
| XXXXXXXXXXXXXXXXXXXX |  |  |
| XXXXXXXXXXXXXXXXXXXX |  |  |
| XXXXXXXXXXXXXXXXXXXX | XXXXXXXXXXXXXXXXXXXX |  |
| XXXXXXXXXXXXXXXXXXXX | XXXXXXXXXXXXXXXXXXXX |  |
| XXXXXXXXXXXXXXXXXXXX | XXXXXXXXXXXXXXXXXXXX |  |

How would the species change from 5 years after to 20 years after the eruption? What could limit the rate of succession at any stage?

**Unit 11**

**WORD BANK:**

**CFC’S GLOBAL WARMING CARBON CYCLE ACID RAIN FOSSIL FUELS**

**POPULATION GROWTH CARRYING CAPACITY RENEWABLE RESOURCES SMOG OZONE LAYER**

**SUSTAINABLE DEVELOPMENT CO2 EMISSIONS EUTROPHICATION HUMAN ACTIVITY CARBON DIOXIDE**

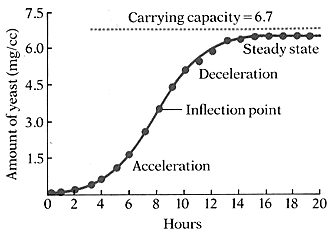
**COAL, PETROLEUM, NATURAL GAS ZERO POPULATION GROWTH U.V. RADIATION**

There is no doubt that \_\_Human \_\_\_\_\_\_ \_\_\_\_\_\_\_\_growth\_ has had the greatest impact on our environment, and is the most important source for environmental change on earth. Over the last 150 years humans have used non –renewable resources such as \_\_oil\_\_\_\_\_, \_\_\_\_coal\_\_\_\_\_\_\_, and \_\_\_\_natural\_\_\_\_\_ \_\_\_gas\_\_\_\_. These energy sources, also known as \_\_\_\_fossil\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_fuels\_\_\_\_\_\_\_\_ are non-renewable because they require millions of years to form. Increased use of fossil fuels as an energy source has caused a variety of problems. \_\_\_Carbon\_\_\_\_ \_\_\_\_dioxide\_\_\_, a gas, is released into the atmosphere when fossil fuels are burned. The increase in the levels of this gas and other gases in the atmosphere ultimately causes an increase in the earth’s average temperature. This phenomenon, known as \_\_\_global \_\_\_\_\_\_ \_\_\_\_\_warming\_\_\_\_\_, can cause rising sea levels and melting of the polar ice caps. The increase in the use of fossil fuels has increased the level of \_\_carbon\_\_(greenhouse effect?)\_\_dioxide? \_\_\_\_\_\_\_, which is the primary driver of global warming. Scientific research and technology have demonstrated that the use of \_\_\_\_\_renewable\_\_\_\_ \_\_\_\_\_\_\_energy\_\_\_\_\_\_, water, wind and geothermal energy, can reduce pollution in the environment. These energy resources come with their own set of problems such as cost and sustainability.

\_\_Acid\_\_\_\_\_ \_\_\_\_rain\_\_\_\_\_\_\_\_\_, caused by the elements sulfur and nitrogen combining with water in the atmosphere, has harmful effects on the environment. \_\_\_Smog\_\_\_\_\_, which is made up of sulfur and nitrogen compounds suspended in the atmosphere, is a source of pollution that harms the environment and causes respiratory problems. The increased use of \_\_\_\_CFCs\_\_\_\_, also known as chlorofluorocarbons, is the major cause of ozone depletion. The \_\_\_ozone\_\_\_ \_\_\_\_\_layer\_\_\_\_\_ is so important. It is made up of a form of oxygen (O3) and is responsible for protecting living things from the harmful radiation of the sun. Overexposure to one type of this harmful radiation, \_UV\_\_ \_\_\_\_(ultraviolet)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, can result in cancer, a decrease in resistance to disease, and eye diseases such as cataracts.

The \_\_\_\_greenhouse\_\_\_\_\_\_\_ \_\_\_\_\_effect\_\_\_\_\_\_\_ is influenced by the burning of fossil fuels, the destruction of vegetation that forms carbon dioxide, and the use of electrical labor saving devices. The most harmful human activity has been the polluting of our environment. Fertilizers are necessary to promote rapid and successful growth of plants and crops. The presence of excessive fertilizer in runoff water after a rainstorm results in \_\_\_\_\_eutrophication\_\_\_\_\_\_\_\_. This process causes the excessive growth of algae in bodies of water, killing fish and other aquatic life.

Early in human history, \_\_\_zero\_\_\_\_\_\_\_\_ \_\_\_population\_\_\_\_\_\_ \_\_\_\_growth\_\_\_\_\_\_\_\_ was the trend with regard to the human population. During this time in history the number of deaths equaled the number of births. Currently, the population of planet earth is growing faster than we can manage. With a population that is well over 7.3 billion people, resources are being utilized at a faster rate than we can replenish them. If the \_\_\_growth\_\_\_\_\_ \_\_\_\_\_\_\_\_rate\_\_\_\_ continues at the rate it has, and we do not find creative ways to replenish our resources and manage our global population, we may eventually exceed the \_\_\_\_\_\_carrying\_\_\_\_\_ \_\_\_\_\_\_capacity\_\_\_\_\_\_\_\_\_ of our planet. When this happens, our planet will no longer be able to sustain the human population, and the death rate globally will rise. \_\_\_\_\_Sustainable\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_practices\_\_\_\_\_\_\_\_\_\_ is one practical way that we can use our resources in such a way that it ensures the availability of these resources in the future.



**The following is a graph that illustrates yeast growth over a period of time. Yeast, just like other organisms, require food, water, and favorable conditions to grow. Yeast also need to get rid of wastes as well. Refer to this graph and answer the following questions:**

1. **What type of growth curve does this illustrate?**

**s-curve**

1. **What are some reasons why the yeast are experiencing growth during hours 4-8?**

**Unlimited resources (space, food)**

1. **The graph refers to a carrying capacity. What is the carrying capacity of this yeast culture?**

**6.2 mg/cc**

1. **What does the carrying capacity tell us?**

**Sustainable population density**

1. **Although it is not represented on this graph, the scientists allow this culture to stay in the incubator beyond 20 hours. They noticed a small decline in the number of yeast cultures after two more hours, followed by a rapid decline to almost no active yeast after 4 more hours. What do you think might have happened? Why do you believe this happened?**

**Population crash caused by the end of limited resources**