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SNC 1D - Ecology Unit Test

1. This question is about energy transformations. Please fill in each blank as appropriate. The size of the blanks are all the same and do not indicate how long the answers might be. Reread when done to see if what you have written makes sense!

The ultimate source of energy for almost all living things on our planet comes from the _____. In order for this energy to enter the _____, it must first be used to complete the process known as _____.

The process required the raw materials of _____ and _____. This process happens in all plants and algae as well as _____. In this process energy is trapped in molecules of _____ and there is a release of life giving _____ into the atmosphere. The energy in the glucose molecules is released as useable food energy, once it has entered a second process called _____.

This process occurs in all cells, both plants and animals. _____ from the air or water is required to make this process work. The bi-products of this process are _____ and _____.

In eukaryotic cells, this process occurs in cellular organelles known as _____. As energy is transferred up the food chain energy is lost at each step. This energy loss means that only about _____ of the energy makes it to the next _____. One thing that contributes to this energy loss is _____.

Pyramids are often used to describe food chain relationships. Food/Energy pyramids always get _____ as you go up the food chain. Inverted pyramids are possible if it is a pyramid of _____.

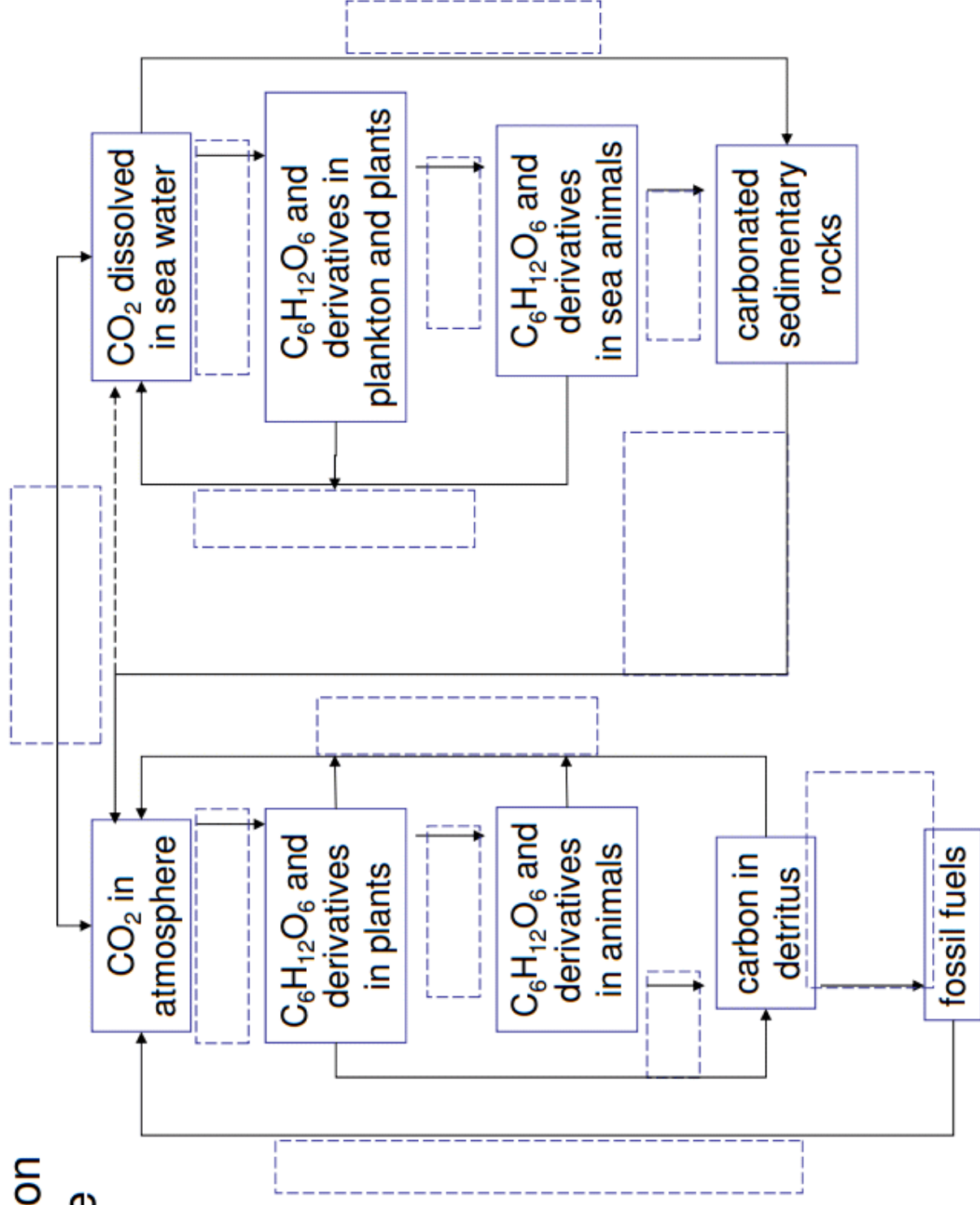
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| | a fancy word that is used to describe the accumulation of both living and non-living material that makes up soil |
| | also know as a herbivore and and always consumes at the second trophic level only |
| | an organism that is able to manufacture its own food, includes all plants |
| | an owl that eats carnivorous mice (mice that eat only bugs, such as the grasshopper mouse that, yes you guessed it, eats grasshoppers) |
| | any water based ecosystem |
| | any organism that eats other living organism in order to obtain food energy, must be a the second trophic level or higher |
| | available resources, either biotic or abiotic that will prevent unrestricted growth |
| | can become out of control and will frequently result in a correction based on limiting factors |
| | consumes producers and consumers |
| | could be a carnivore or an omnivore (depending on what it eats), cannot be a herbivore |
| | includes all locations on earth where living material can be found |
| | includes all water, whether found in oceans, lakes, rivers streams or in the ground (ground water) |
| | includes all living things in a given area and there interaction with their environment |
| | lives off of the dead remains of both plants and animals, helps to convert dead material back to soil |
| | never consumes producers |
| | number of species in a given location (an time) |
| | obtains its energy directly from the sun through photosynthesis (or directly from chemical substances through chemosynthesis) |
| | occurs when toxic substances from the environment build up in an organisms tissues |
| | occurs higher up the food chain when toxins found in prey concentrate in the predator |
| | occurs when birth and death rates become the same, creates a static population |
| | only consumes producers |
| | specializes in eating dead animal carcasses |
| | the fish that ate the fish that ate the fish that ate the fish that ate the plant |
| | the non-living components in an ecosystem |
| | the living parts of an ecosystem |
| | the population size that can can occur based on available resources |

- | | | | |
|---|-------------------|---|---------------------|
| A | abiotic | N | exponential growth |
| B | aquatic | O | herbivore |
| C | autotroph | P | heterotroph |
| D | bioaccumulation | Q | hydrosphere |
| E | biomagnification | R | limiting factor |
| F | biosphere | S | omnivore |
| G | biotic | T | population |
| H | carnivore | U | primary consumer |
| I | carrying capacity | V | producer |
| J | decomposer | W | quaternary consumer |
| K | detritus | X | scavenger |
| L | ecosystem | Y | secondary consumer |
| M | equilibrium | Z | tertiary consumer |

Name : _____

Carbon Cycle



Fill in each dashed box with the name of the process that is responsible for changing the carbon found in each carbon repository to the carbon in the next repository. The arrows point the direction that the carbon travels. Be sure to include the processes photosynthesis and cellular respiration in the correct spot.

Name: _____

4. Please answer the following questions about the nitrogen cycle:

a) Name two types (classifications) of molecules in living things that require nitrogen atoms.

b) Where is there an abundant supply of nitrogen and why is this supply difficult to use?

c) What is the name of the process by which nitrogen can enter a chemical form that can pass into living things and travel up the food chain?

d) What are three ways that the process you have named in c) can occur?

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e) Where do you get your nitrogen from?

5. Design a food chain that includes the sun and four trophic levels. Use and organisms you choose. Label each organism twice, once with trophic level and a second time with the alternate method frequently used in class. If you are stuck, revisit the mix and match page. Place your organisms in the second row of this table, the trophic level above and the alternate method below

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|-----|--|--|--|--|
| SUN | | | | |
| | | | | |
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Design a pyramid of numbers that represents your food chain.

If 10% of the suns energy is absorbed by the 1st level, what percent of the suns energy can make it to the last level?

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6. Design a food web given the following information. Be sure to include an arrow for every food relationship. Organize according to trophic level. Use the predominant trophic level when an organism eats at more than one level. Include the sun. You do not need to include any abiotic factors other than the sun. Please label the trophic levels and label as second time using: producer, primary consumer etc....

| Organism | What it Eats |
|--|--|
| PINE TREE that make seed containing cones | These four organisms are sun eaters!! Mmm! Mmm! Good to the last drop! (sun drop that is) |
| OAK TREE that make leaves and acorns | |
| FLOWING PLANTS that make seeds | |
| GRASSES that make small seeds | |
| song SPARROW | all seeds and caterpillars |
| CATERPILLAR | oak leaves only |
| red SQUIRREL | any larger seed and acorns, occasional caterpillar |
| herbaceous RABBIT | grass and flowering plants |
| sparrow HAWK | smaller birds, squirrels, young rabbits |
| COYOTE | anything that is flesh (except caterpillars) |
| VULTURE | any dead animals (not caterpillars) |

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7. An invasive species of fish, the "Asian Carp" (a herbaceous fish) is introduced in to an ecosystem and is able to effectively out compete the resident "Common Carp" (also a herbaceous fish). Please graph the following data. Please label your axis appropriately!

| Year | Asian Carp Population | Common Carp Population |
|------|-----------------------|------------------------|
| 1995 | 3 | 420 |
| 1996 | 12 | 440 |
| 1997 | 50 | 430 |
| 1998 | 188 | 400 |
| 1999 | 740 | 105 |

| Year | Asian Carp Population | Common Carp Population |
|------|-----------------------|------------------------|
| 2000 | 1040 | 85 |
| 2001 | 950 | 92 |
| 2002 | 975 | 73 |
| 2003 | 960 | 89 |
| 2004 | 1008 | 90 |

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- a) What type of growth is exhibited by the Asian Carp between 1995 and 1999?

- b) What happens to the growth rate of the Asian Carp after 1999? Why?

- c) Overall, what type of growth curve do the Asian Carp exhibit?

- d) What happens to the population of Common Carp over the ten year period of the study and why?

- e) How can the term carrying capacity and equilibrium be applied to help explain the observed populations?

- f) Predict what would happen to the Black Bear population. Why would the Black Bear population be slower to change than either fish species?

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