

K	C	A	T
45	10	28	28

/111 = % Name: _____

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 SUN. In order for this energy to enter the FOOD CHAIN, it must first be used to complete the process known as PHOTOSYNTHESIS. The process required the raw materials of CARBON DIOXIDE and WATER. This process happens in all plants and algae as well as SOME BACTERIA (BLUE GREEN). In this process energy is trapped in molecules of GLUCOSE and there is a release of life giving OXYGEN into the atmosphere. The energy in the glucose molecules is released as useable food energy, once it has entered a second process called CELLULAR RESPIRATION. This process occurs in all cells, both plants and animals. OXYGEN from the air or water is required to make this process work. The bi-products of this process are CARBON DIOXIDE and WATER. In eukaryotic cells, this process occurs in cellular organelles known as MITOCHONDRIA. As energy is transferred up the food chain energy is lost at each step. This energy loss means that only about 10 PERCENT of the energy makes it to the next TROPHIC LEVEL. One thing that contributes to this energy loss is HUNTING, GATHERING, DIGEST. Pyramids are often used to describe food chain relationships. Food/Energy pyramids always get SMALLER as you go up the food chain. Inverted pyramids are possible if it is a pyramid of NUMBERS.

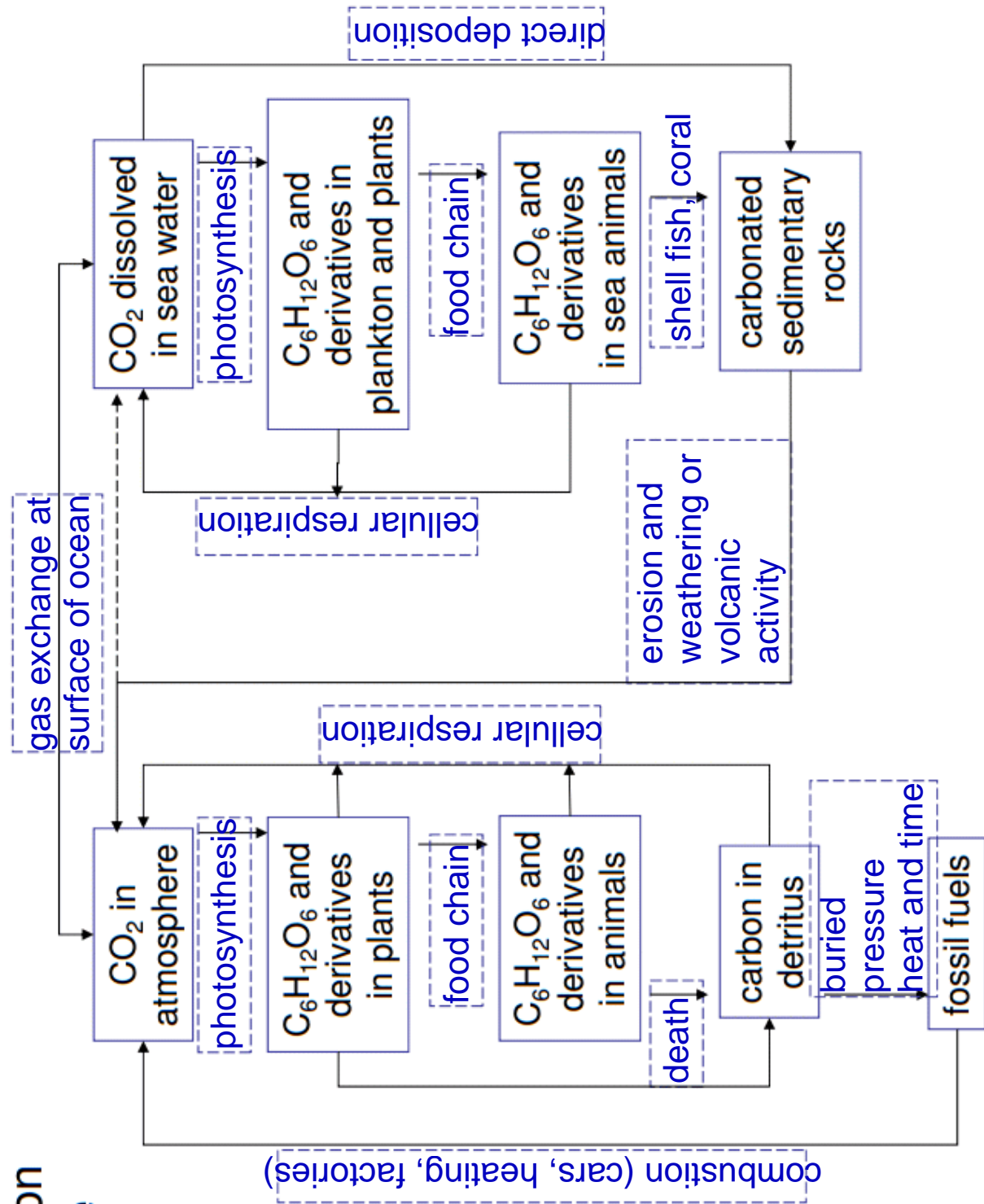
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K	a fancy word that is used to describe the accumulation of both living and non-living material that makes up soil
U	also know as a herbivore and and always consumes at the second trophic level only
C	an organism that is able to manufacture its own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

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

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

PROTEINS

DNA AND RNA

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

ATMOSPHERE IS 78% NITROGEN

ATMOSPHERIC NITROGEN IS INERT, UNREACTIVE

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?

NITROGEN FIXATION

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

LIGHTENING

NITROGEN FIXING BACTERIA

MAN-MADE FERTILIZERS

e) Where do you get your nitrogen from?

FROM THE FOOD WE EAT

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

	1 ST TROPHIC LEVEL	2 ND TROPHIC LEVEL	3 RD TROPHIC LEVEL	4 TH TROPHIC LEVEL
SUN	PLANT	HERVIBORE	CARNIVORE 1	CARNIVORE 2
	PRODUCER	PRIMARY CONSUMER	SECONDARY CONSUMER	TERTIARY CONSUMER

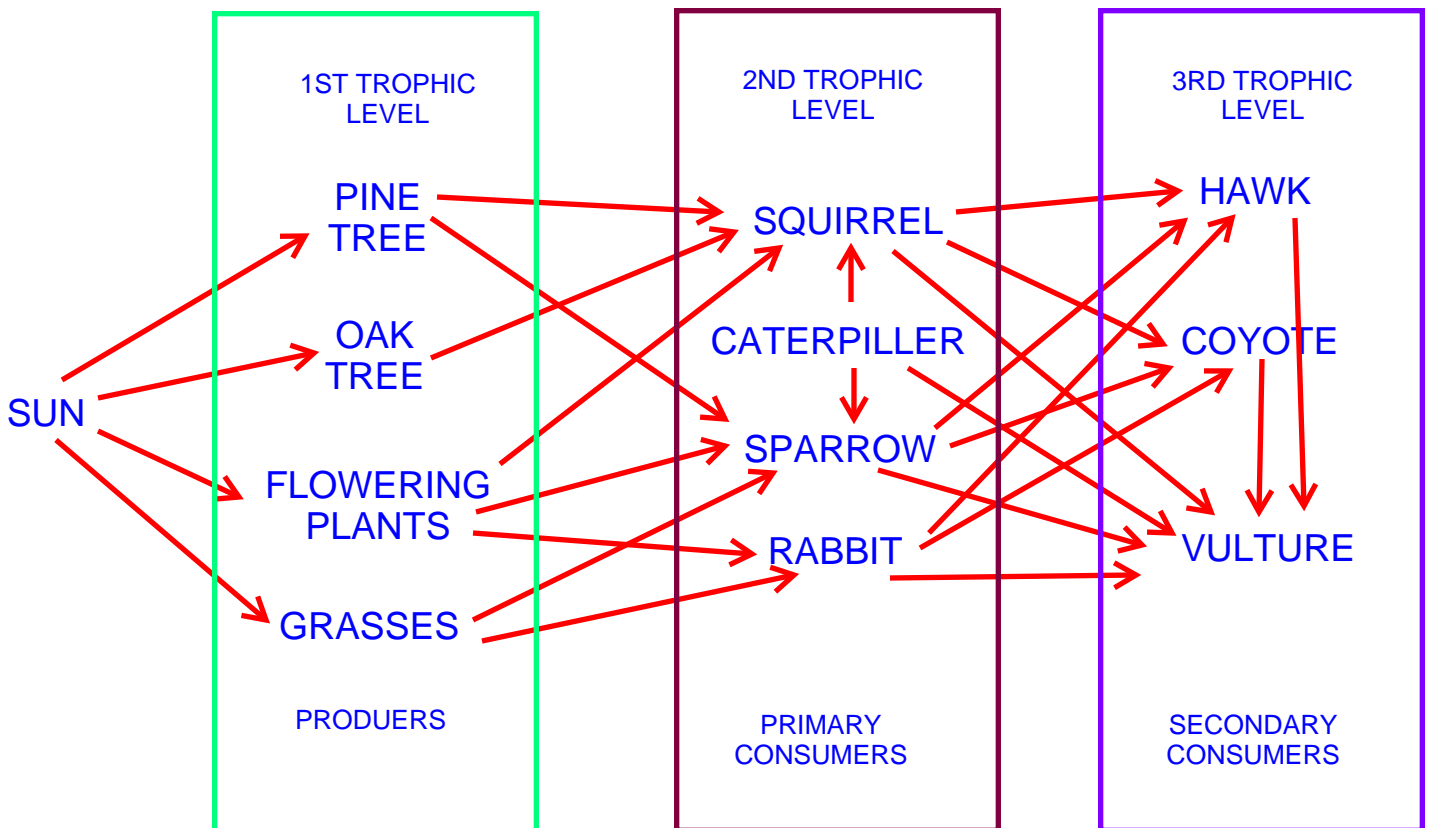
Design a pyramid of numbers that represents your food chain.

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?

0.01 %

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)

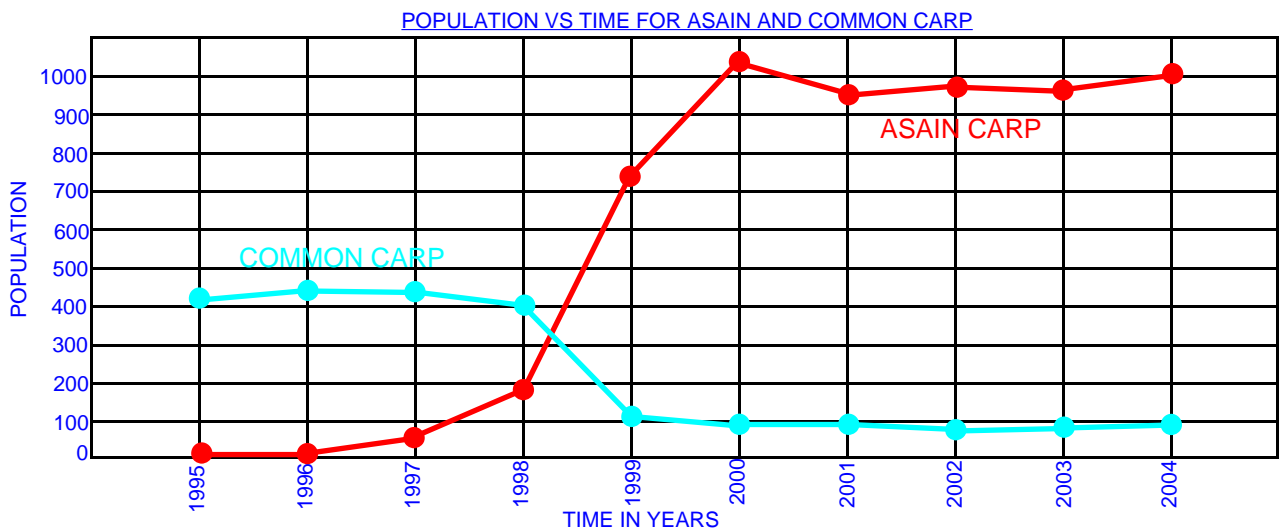


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7. An invasive species of fish, the "Asian Carp" (a herbaceous fish) is introduced in to an ecosystem and is able to effectively out compete the resident "Common Carp" (also a herbaceous fish). Please graph the following data. Please label your axis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



- a) What type of growth is exhibited by the Asian Carp between 1995 and 1999?
EXPONENTIAL
- b) What happens to the growth rate of the Asian Carp after 1999? Why?
GROWTH RATE DECREASES - STABILIZES
LIMITING FACTOR ARE REACHED - LIMITS GROWTH
- c) Overall, what type of growth curve do the Asian Carp exhibit?
LOGISTIC
- d) What happens to the population of Common Carp over the ten year period of the study and why?
DECREASE AND THEN STABILIZES
COMPETITION FOR FOOD RESOURCES WITH ASIAN CARP
- e) How can the term carrying capacity and equilibrium be applied to help explain the observed populations?
ASIAN CARP REACH THE CARRYING CAPACITY OF THEIR ENVIRONMENT
AND ACHIEVE A POPULATION EQUILIBRIUM
- f) Predict what would happen to the Black Bear population. Why would the Black Bear population be slower to change than either fish species?
BEAR POPULATION SHOULD INCREASE DUE TO AVAILABL
BEAR HAVE A SLOW REPRODUCTION RATE - TAKES MORE

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