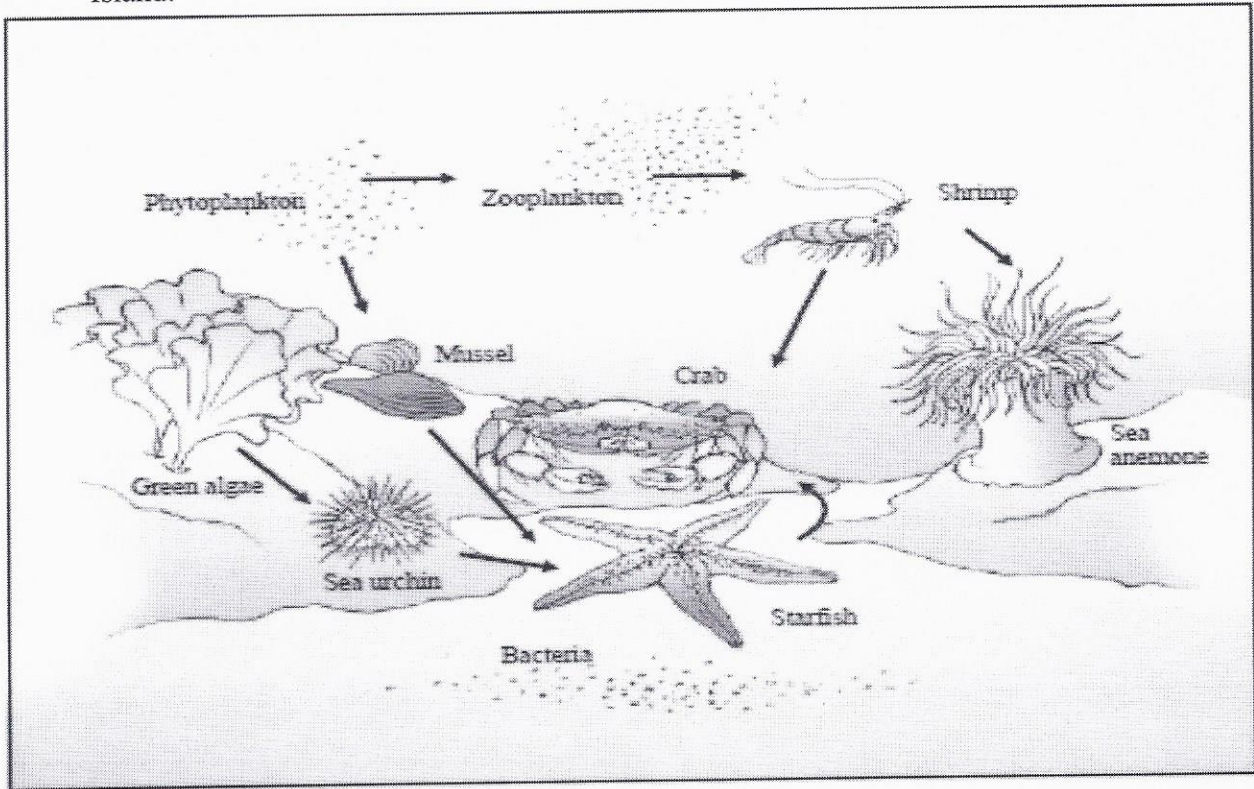


Ecosystems worksheet

1. The following diagram shows the food web for the coastal species living off Grand Island.



State in which trophic level each organism belongs to.

	Producers	Consumers	Decomposers
A	Green algae, phytoplankton and zooplankton	Shrimp, anemone, urchin, muscle and crab	Bacteria and starfish
B	Green algae, phytoplankton and zooplankton	Shrimp, anemone, urchin, muscle, starfish and crab	Bacteria
C	Green algae and phytoplankton	Zooplankton, shrimp, anemone, urchin, muscle and crab	Bacteria and starfish
D	Green algae and phytoplankton	Zooplankton, shrimp, anemone, urchin, muscle, crab and starfish	Bacteria

2. Using the same food web as number 1, biologists have noticed a rapid decline in the sea anemone population of the estuary near Grand Island. At first, they thought this was caused by abiotic factors, but they discovered that the direct cause of this rapid decline is a new type of fungus affecting sea anemones only. In the short term, what impact is this disturbance likely to have on the zooplankton population?

↓ in zooplankton because there is an ↑ in shrimp.

3. The table below gives a list of disturbances. Some are natural, and others are the result of human activity. Table I - Different Possible Disturbances

Disturbances			
1.	Volcanic eruption	4.	Tree cutting
2.	Acid rain	5.	Forest fire
3.	Snowstorm		

Which of these disturbances result from human causes only?

A) 1, 2 and 3

B) 1 and 3

C) 1, 3, 4 and 5

D) 2 and 4

4. Which of the following descriptions does not correspond to an ecosystem? Explain your answer. (It is a multiple choice)

A) Bears, hares and beavers live in the Forêt rare du Lac-Duparquet, a forest in the Abitibi region. Fir and birch are the predominant tree species that benefit from the rich soil and the long hours of summer sunshine.

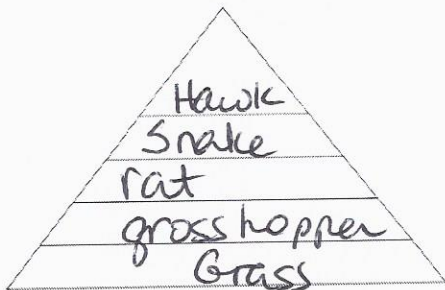
B) Felix owns a terrarium, home to his pet lizard. He has equipped the terrarium with a heat lamp, a water dispenser and a hollow branch to shelter the lizard, and he feeds his pet crickets.

C) On one of the continents lies a desert of rocks. Conditions there are extreme: daytime temperatures are very high, precipitation is low, and high winds buffet the area.

D) Sparrows and thrushes frequently visit my small urban back yard. Squirrels come by, too; last summer they ate the sunflowers I had planted, while the birds feasted on the grapes from my vine. My garden thrives nonetheless because I water it frequently and the soil is fertile.

5. Place the following words in the correct level on the food pyramid.

Hawk – Grass – Rat – Grasshopper – Snake



6. The Earth contains many biomes, including the arctic tundra, the tropical forest, the desert, the boreal forest and grasslands.

a) Which of these biomes has the greatest primary productivity? *rainforest*

b) Which of the factors that affect primary productivity make this biome the most productive?

light, temperature, nutrients + water

c) Which organisms are responsible for producing new organic matter (biomass)?

Autotrophs - producers

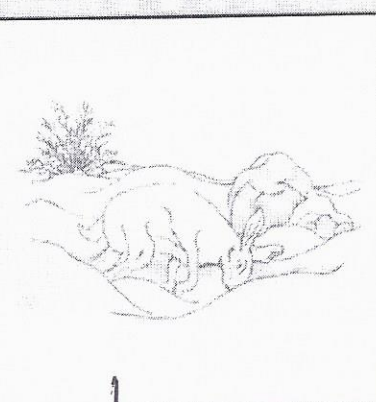

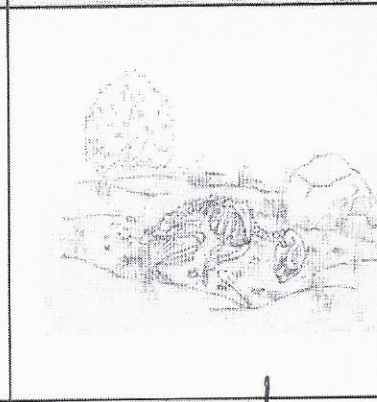
7. An ecosystem is composed of water, trees, beavers, ducks, aquatic plants and soil. Which of these elements are not calculated as part of the biomass?

Water + Soil

8. A carnivore cannot be a primary consumer in a food chain. Explain your answer.

Primary must eat producers. Carnivores do not eat producers

9. A hare died in a field in December. Explain the steps in the chemical recycling process by describing what happens in each of the months indicated.

January	March	May
		

↓
decomposition begins by decomposers

↓
decomposition continues

↓
Chemical recycling occurs. Organic to inorganic by decomposers & make soil rich in nutrients

10. The forest in Québec is home to a surprising carnivore: the fisher. It is the principal predator of the porcupine, which feeds on shoots and various plants. Meanwhile, the fisher is sometimes the prey of the black bear, whose menu varies widely, from relatively large carnivores like the fisher to handfuls of wild berries. The forest floor beneath these animals contains many fungi and insects, which live off dead plants and trees.

a) Create a food chain, using the information above.

Shoots → porcupine → fisher → bear → fungi

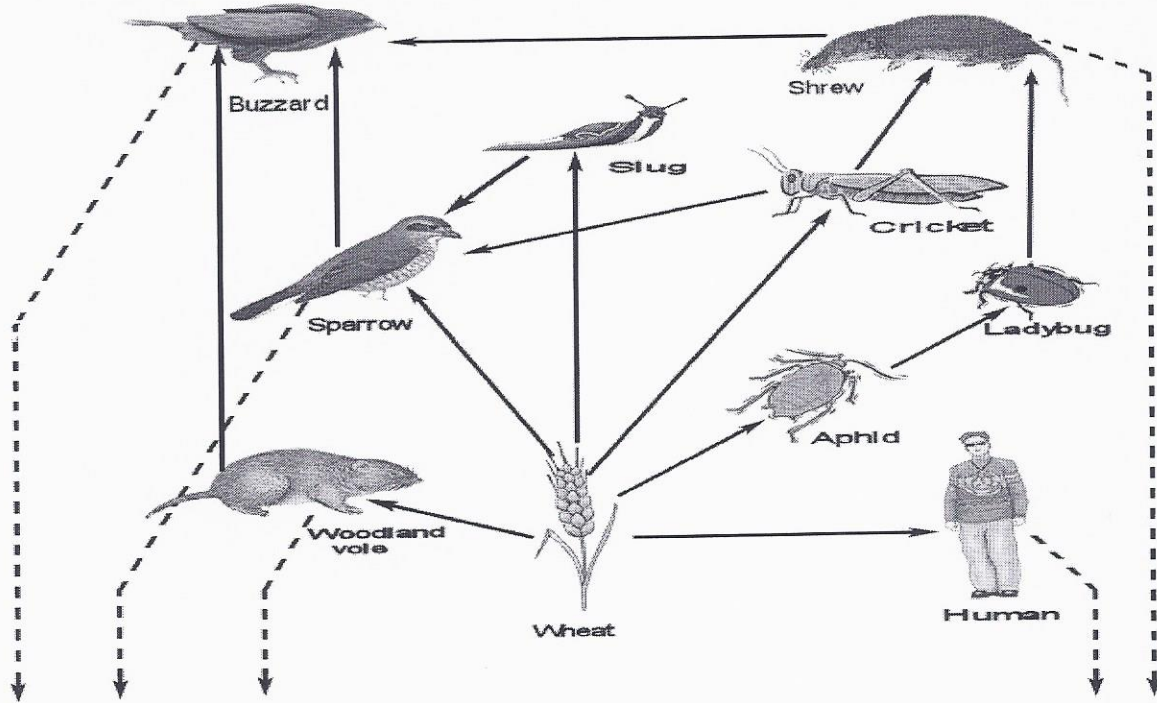
b) Put each organism in the information above in the trophic level they belong to.

Producers
Shoots of plants
wild berries

Consumers
fisher
bear
porcupine

decomposers
fungi
insects

11. In recent years, wheat farmers have noticed a sharp increase in the woodland vole population. Wheat, an important food source for humans, is also an important part of the diet of woodland voles. Woodland voles are often labelled as pests since they can carry bacteria and viruses. The farmers are worried about their harvest and are considering the possibility of spreading a rodent poison that will eliminate the voles.



a) Give three consequences to the food web if the vole population continues to increase.

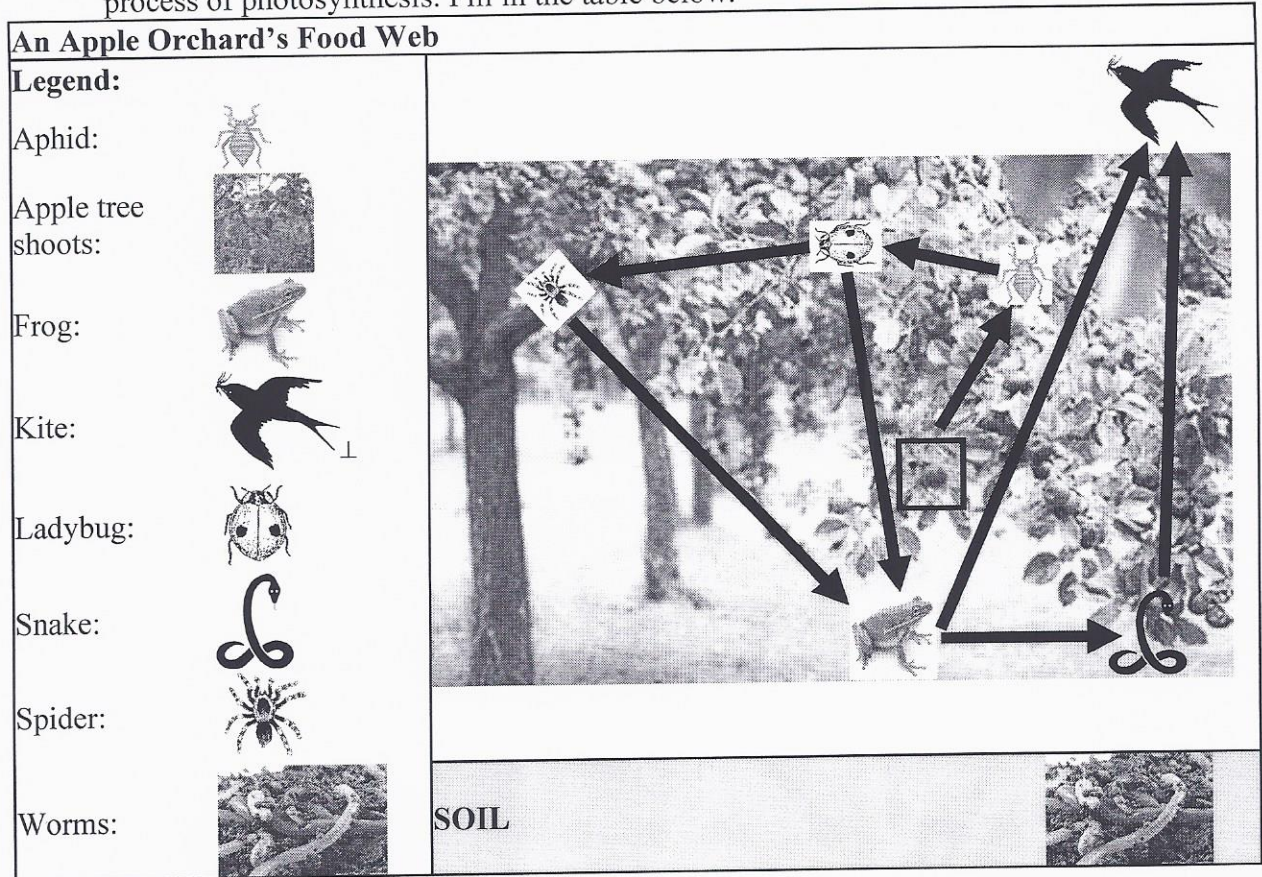
↓ wheat, ↓ sparrow, slug, cricket & aphid less food for them

↑ buzzard - has more prey

b) Give an explanation to why the increase in the vole population may have occurred.

Buzzard population may have decreased ∴ vole has less predators & can reproduce.

12. Apple cultivators must consider all aspects of the Orchard's ecosystem in order to ensure the highest possible crop yield. The trees in the orchard obtain their energy through the process of photosynthesis. Fill in the table below.



Producer(s)	apple shoots	4 th consumer(s)	frog + snake
1 st consumer (s)	aphid	5 th consumer(s)	snake + kite
2 nd consumer(s)	lady bug	6 th consumer(s)	kite
3 rd consumer(s)	spider + frog	Decomposer(s)	Worms