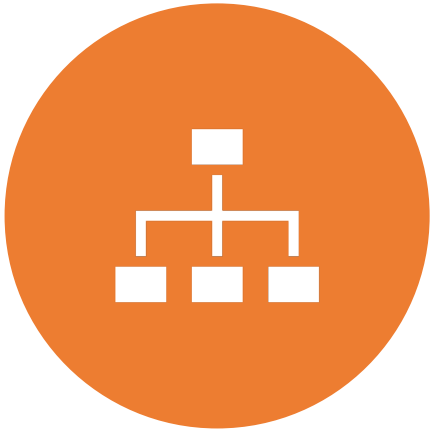
GED Science
Day 6

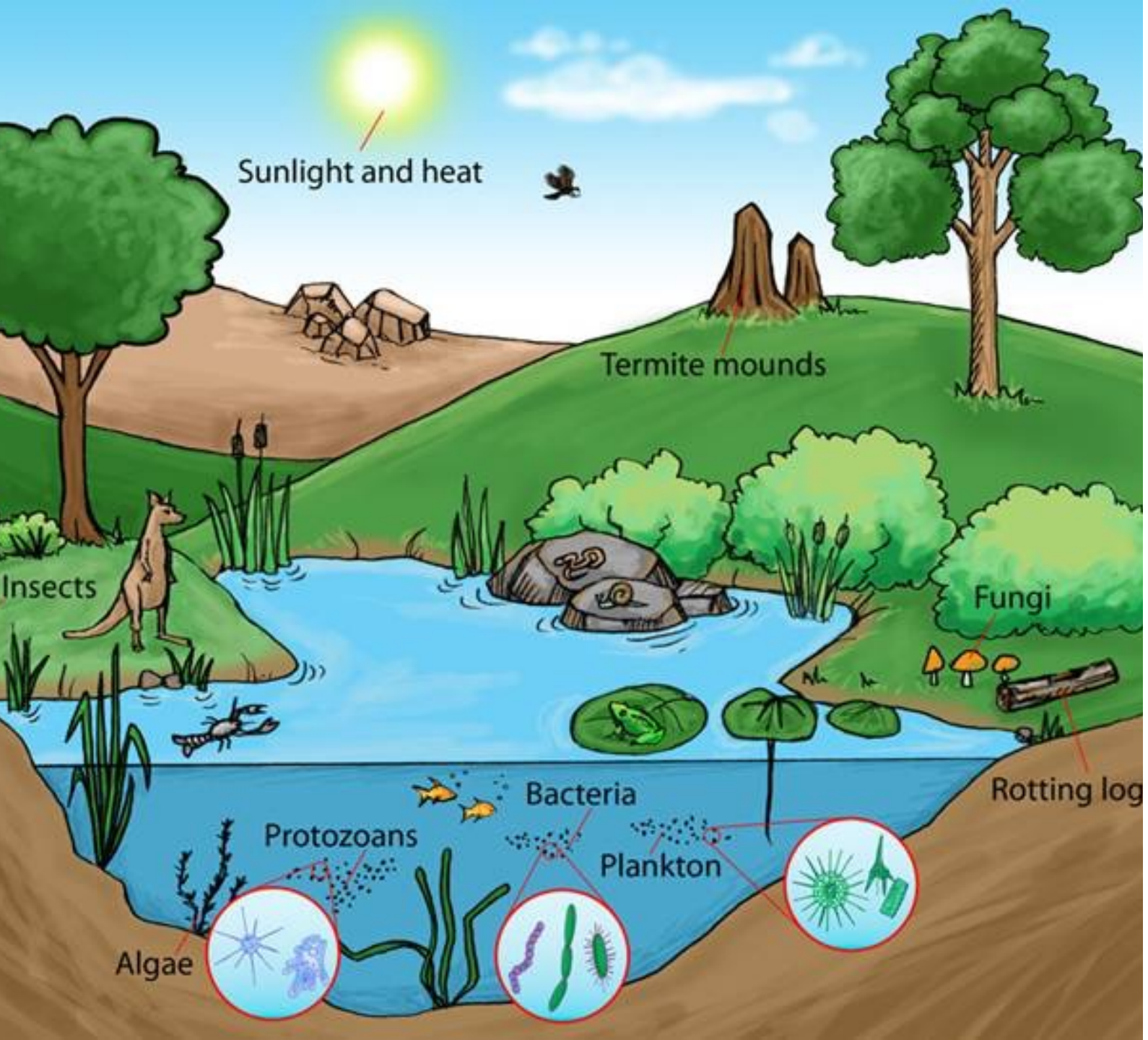
Essential Questions



WHAT IS THE OVERALL STRUCTURE OF AN ECOSYSTEM?

WHAT ARE THE DIFFERENT TYPES OF INTERACTIONS BETWEEN ORGANISMS IN THE ECOSYSTEM?

HOW DOES HUMAN INTERACTION AFFECT ECOSYSTEMS?


Sunlight and heat
Termite mounds
Insects
Fungi
Rotting log
Bacteria
Protozoans
Plankton
Algae

Ecosystems

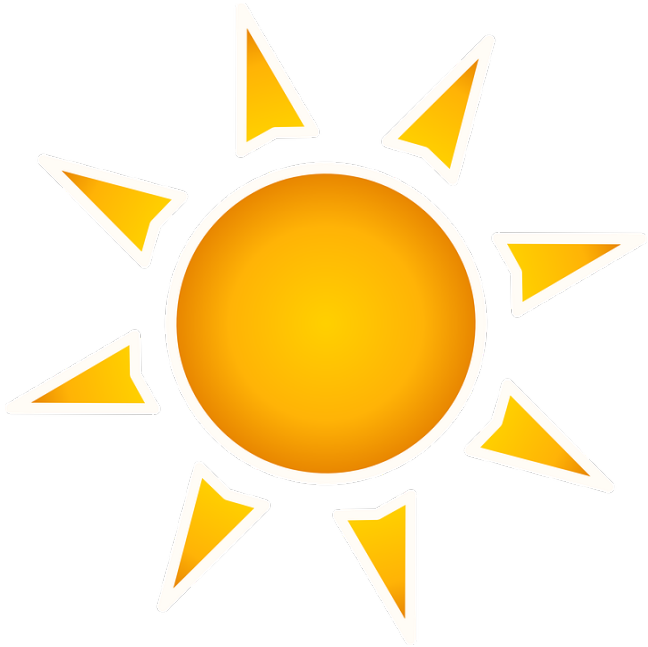
Ecosystems

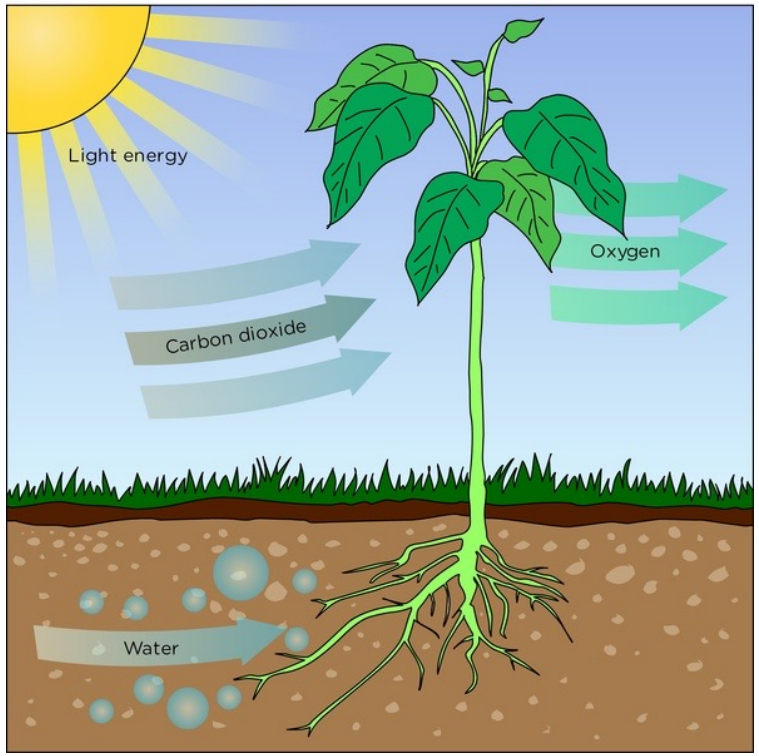
An ecosystem includes all the living things in an area, along with their nonliving environment.

Living

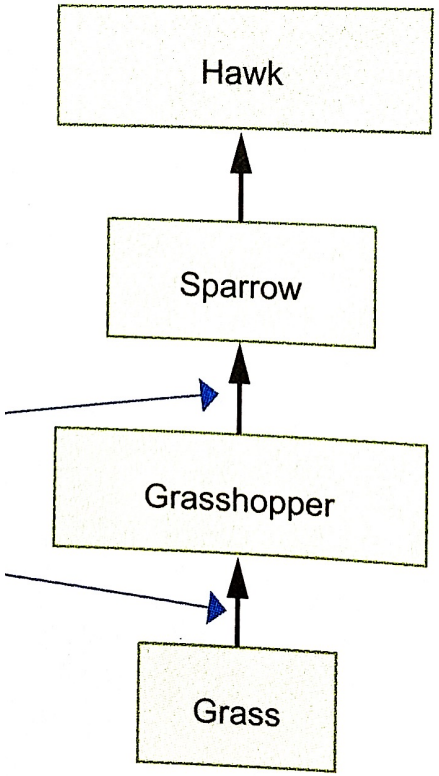
Nonliving (natural)

Energy flows through the living parts of an ecosystem. In most ecosystems, the energy originates from the sun. Plants use energy from sunlight and nutrients from air, water, and soil to make food.





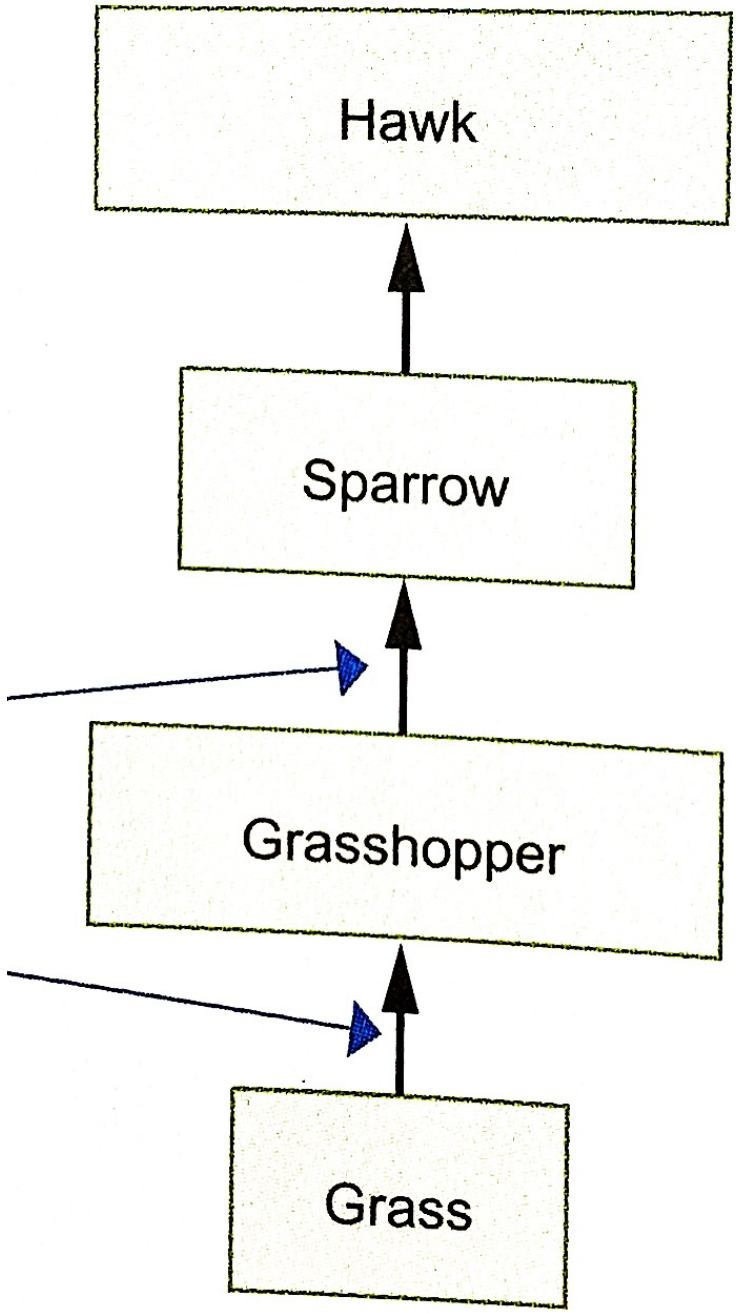
Each organism gets energy from its food and passes on energy to any organism that feeds on it. A food chain shows a single path of feeding relationships among certain organisms in an ecosystem. The diagram shows a food chain in a grassland ecosystem.



The arrows show the direction in which the food moves from one organism to another.

Which statement describes a feeding relationship shown in the diagram?

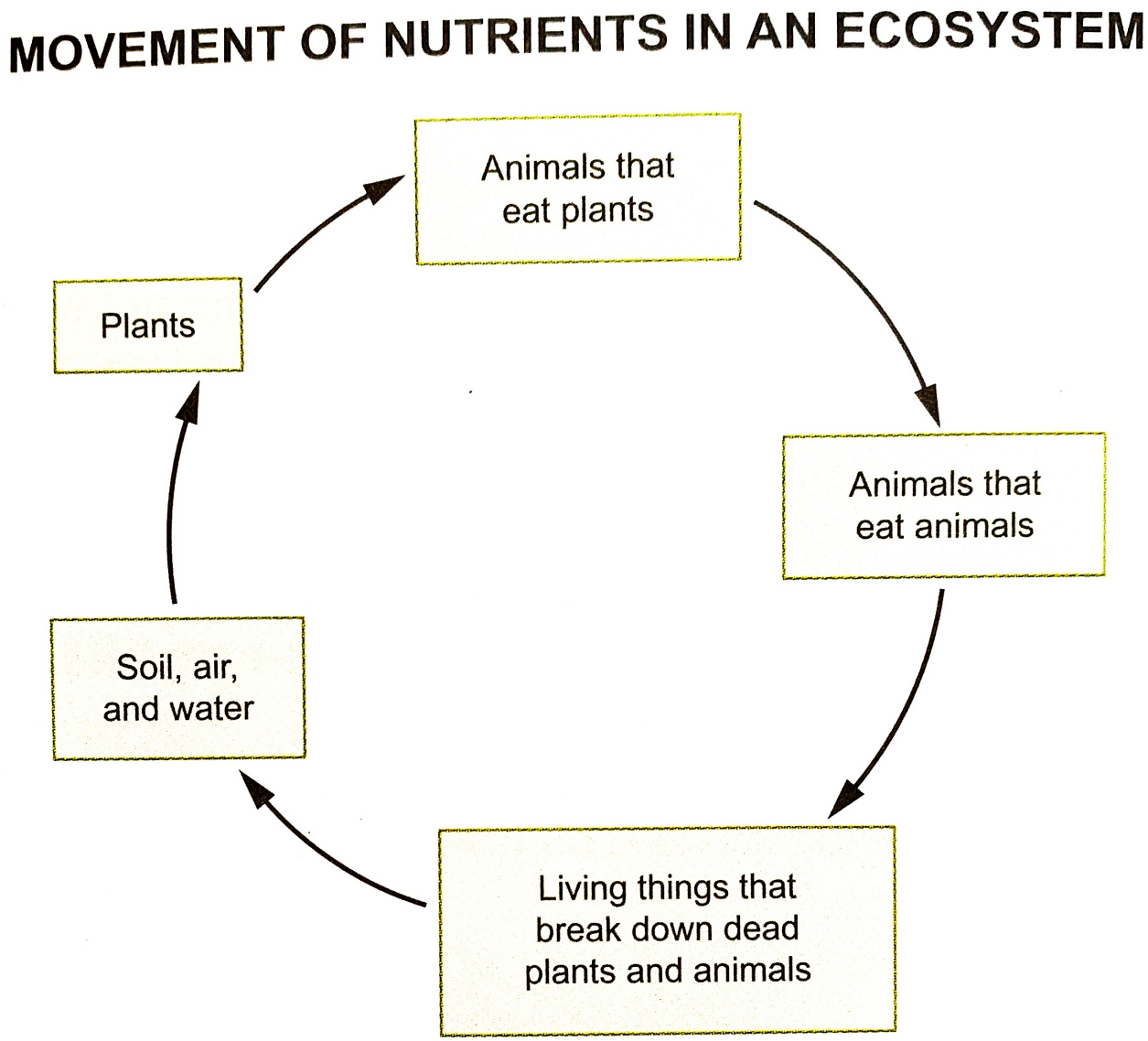
A. Hawks eat grass.
B. Grasshoppers eat sparrows.
C. Sparrows eat grasshoppers.
D. Hawks eat grasshoppers.



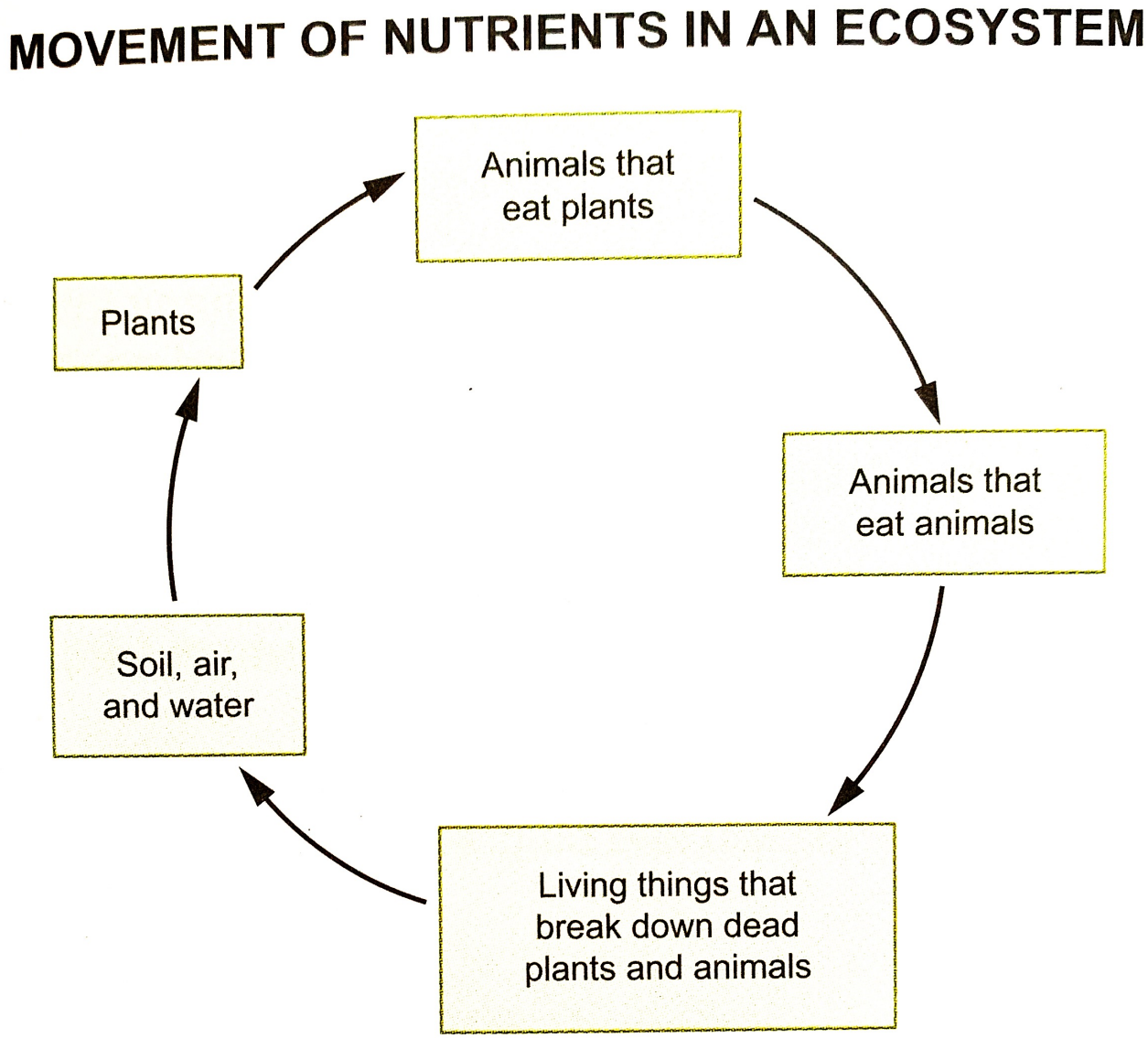
Movement of Nutrients in an Ecosystem

Matter, or the material that makes up everything around us, is continuously recycled in an ecosystem.

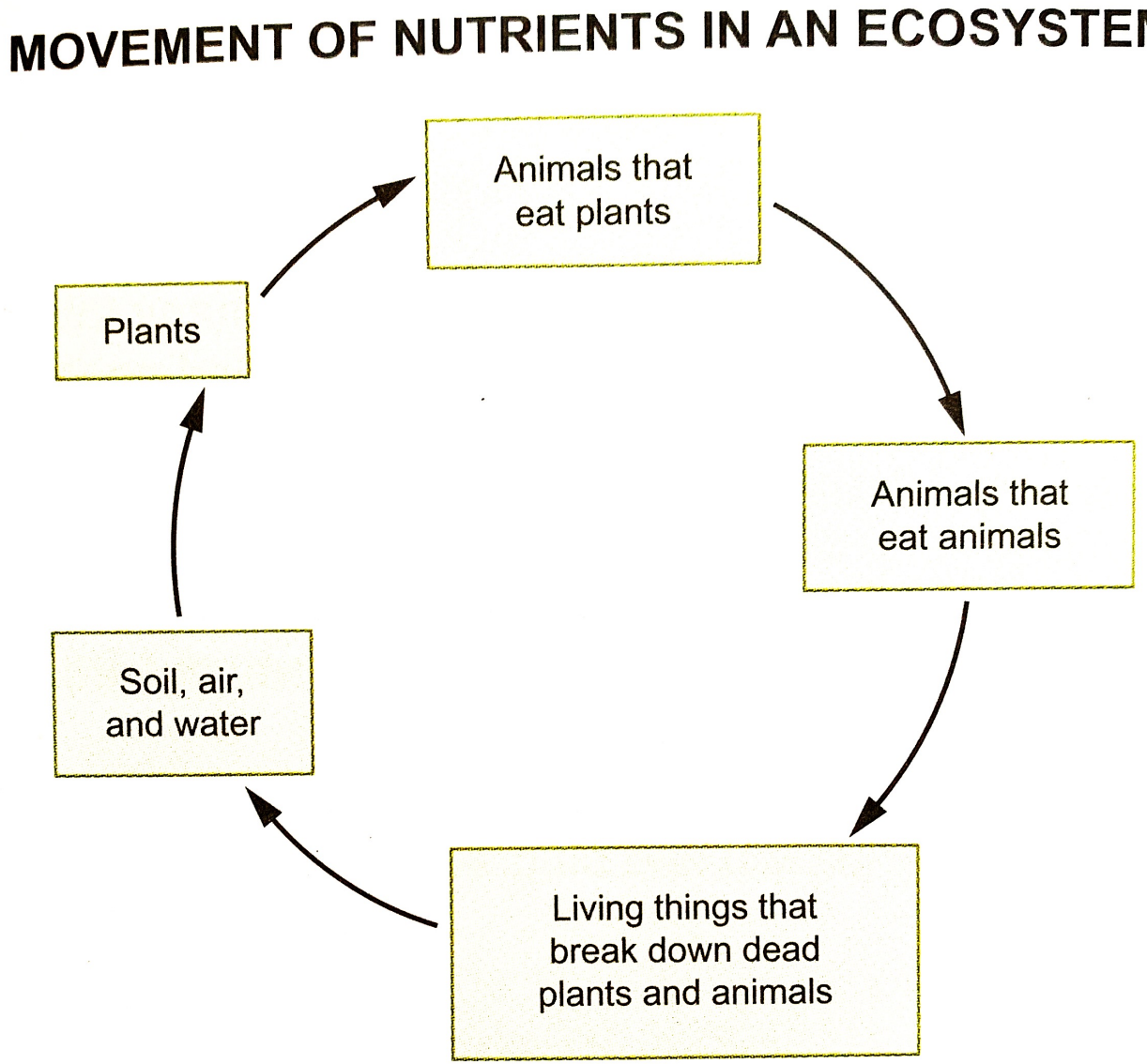
Organisms get materials they need to live from the environment. They then release waste matter back into the environment. Nutrients are one form of matter that cycles through an ecosystem. The diagram shows the movement of nutrients in a land-based ecosystem.



- Based on the diagram, which statement describes a flow of nutrients in a land-based ecosystem?
  - A. Most animals obtain nutrients by eating other animals.
  - B. Plants obtain nutrients from soil, air, and water.
  - C. Animals that eat animals are a source of nutrients for animals that eat plants.
  - D. Living things that break down dead plants and animals contribute no nutrients to the ecosystem.

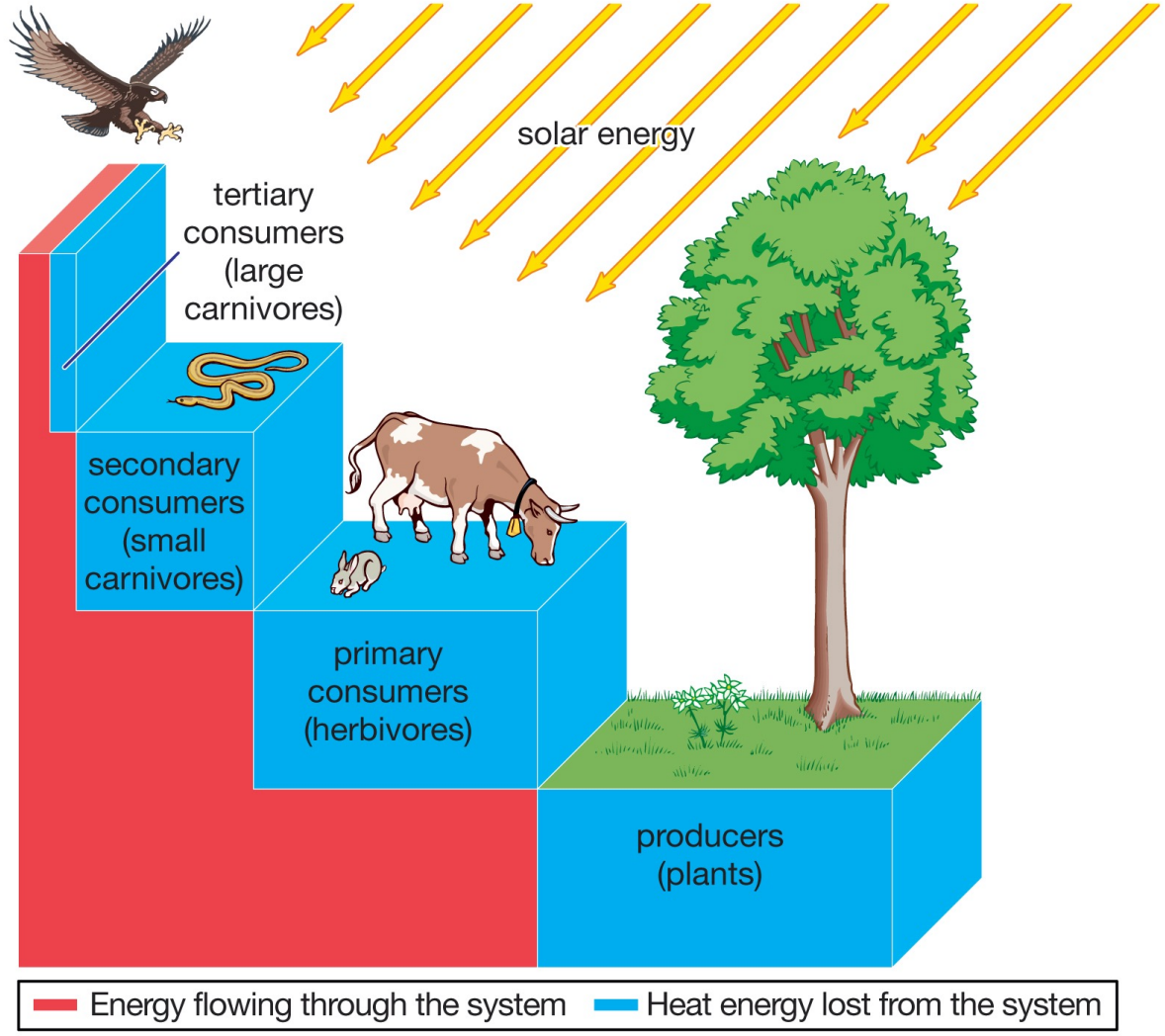


- What would happen to the movement of nutrients shown in the diagram if all the plants in the ecosystem died?
  A. Nutrients would continue to cycle through the ecosystem, skipping the missing step.
  B. Plant-eating animals would start eating other animals.
  C. The nutrients cycle would end.
  D. Soil, air, and water supplies would decrease and eventually end.

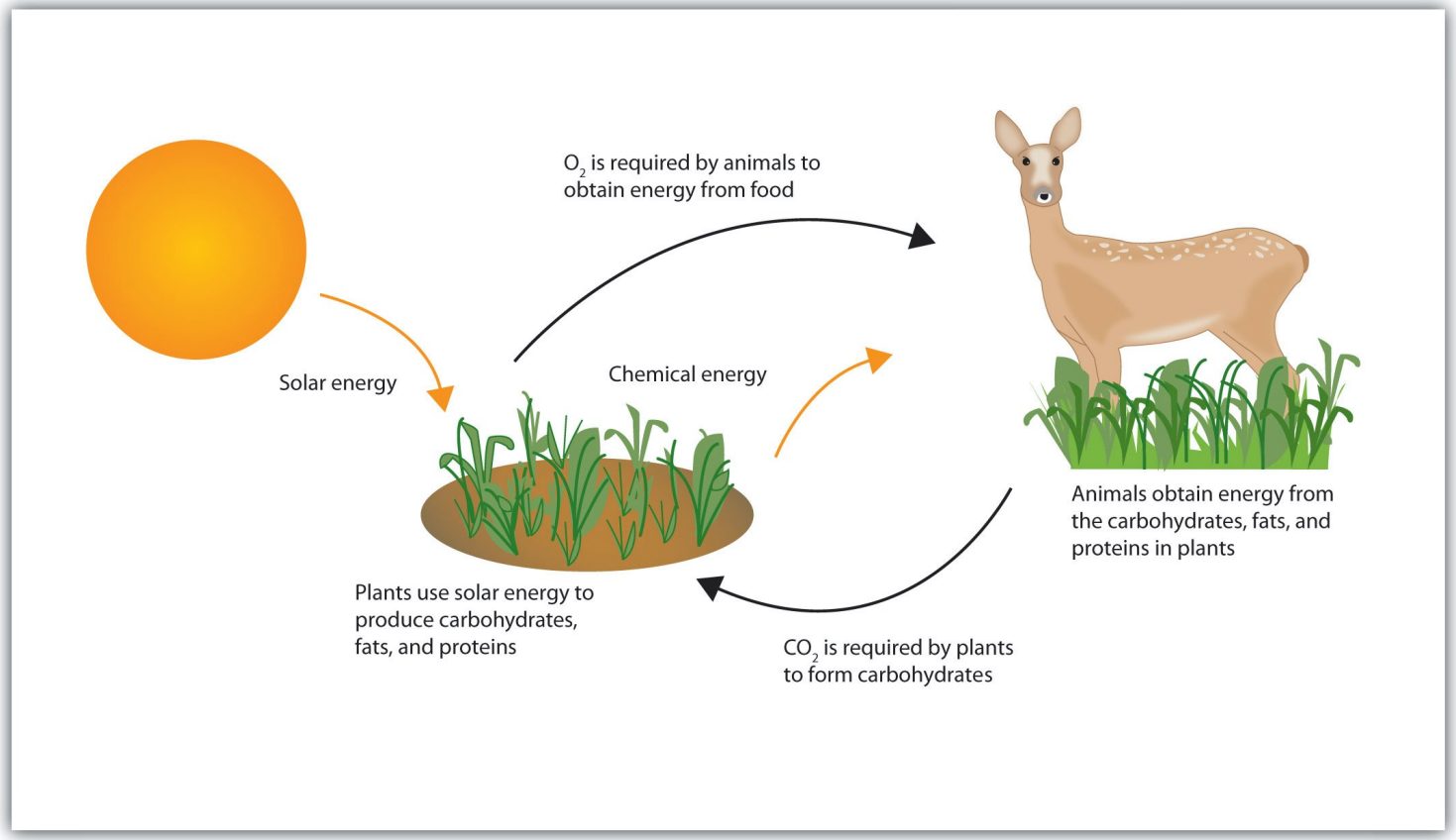


Movement of Energy in an Ecosystem

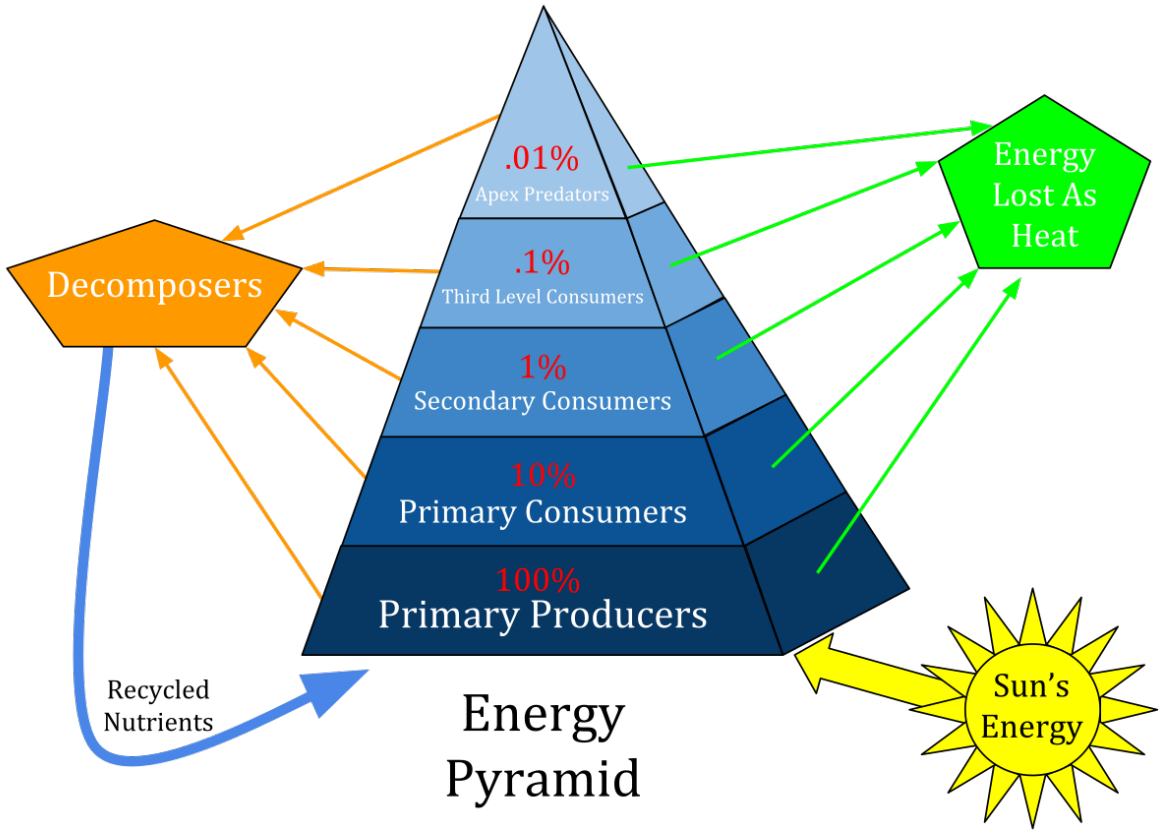
As energy flows through an ecosystem, it is conserved. That is, the amount of energy neither increases nor decreases.

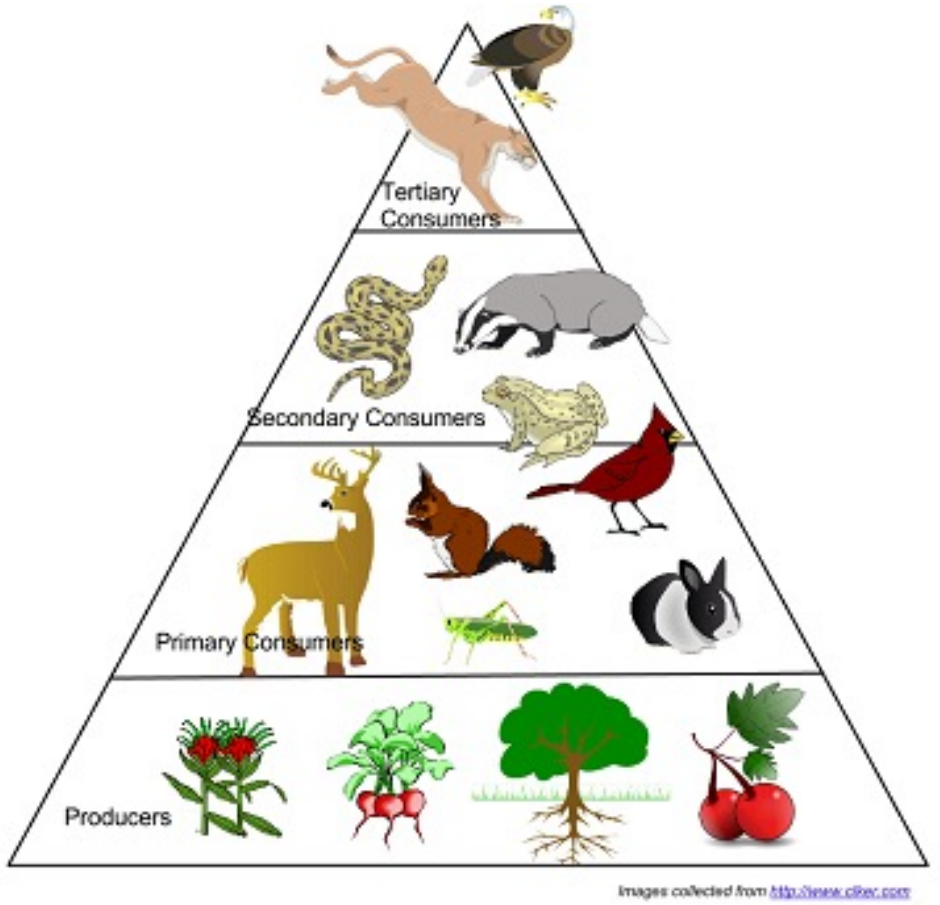


Plants get energy by making food. Animals get energy by eating food in the form of plants and other animals. Living things convert the energy stored in food into energy for movement, growth, and repair.



A small amount of energy that a living thing takes in is stored in the cells of the body. Most of the energy is lost to the environment as heat, sound, motion, and – in some cases – light. Energy pyramids show how energy flows through ecosystems

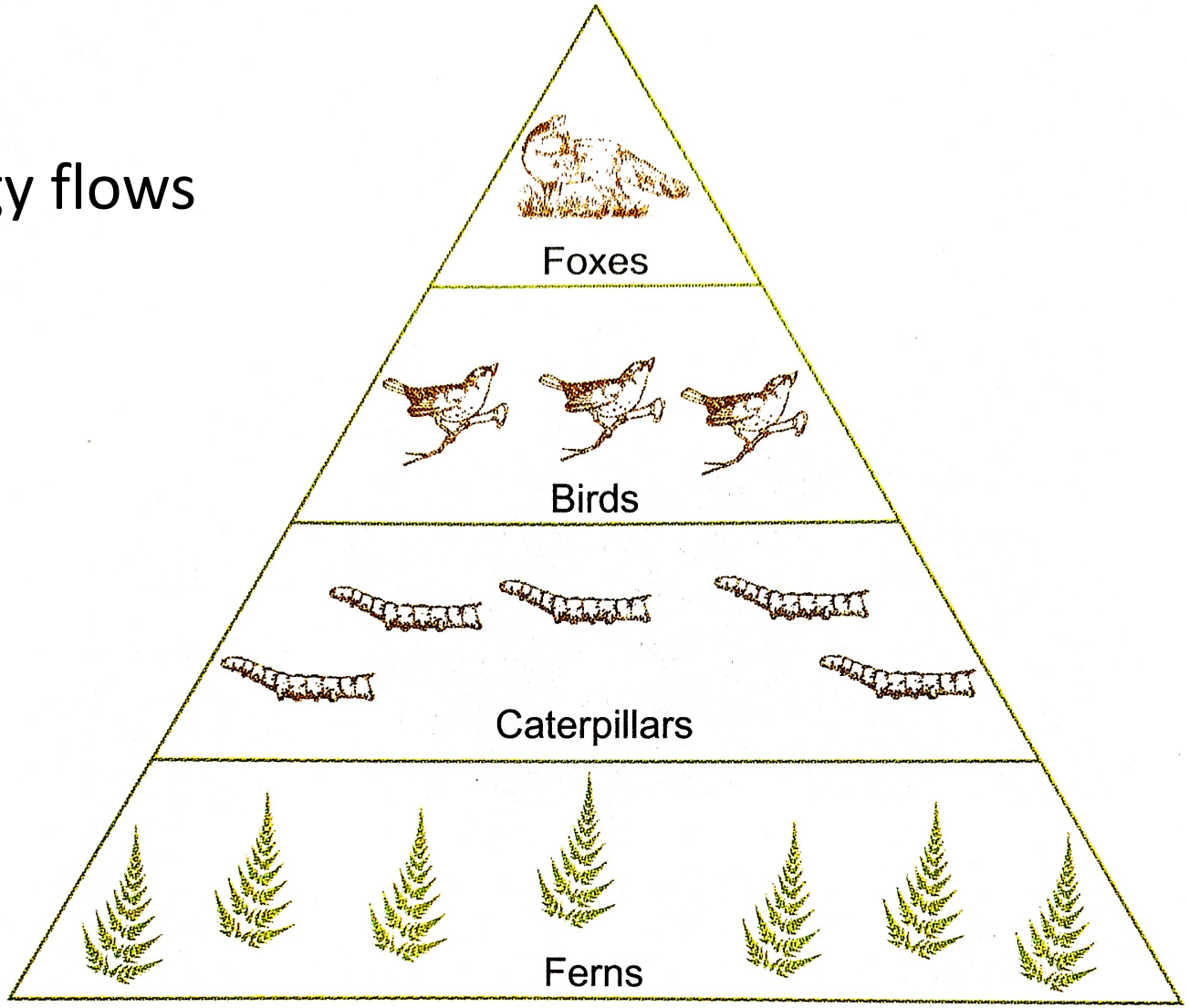




The diagram shows an energy pyramid for a forest ecosystem.

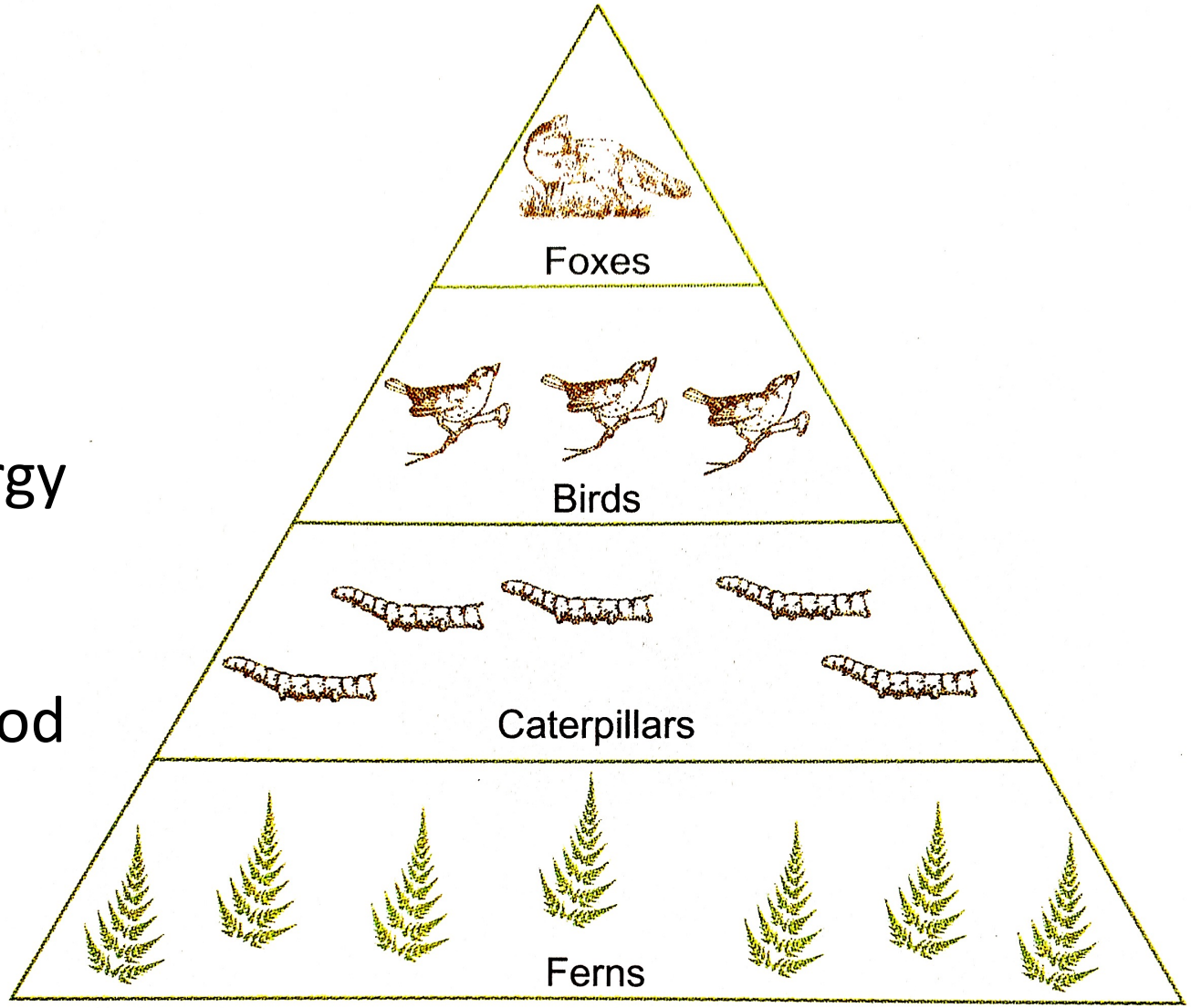
- What is one way in which energy flows through the forest ecosystem represented by the diagram?

A. From ferns to caterpillars
B. From foxes to ferns
C. From birds to ferns
D. From birds to caterpillars



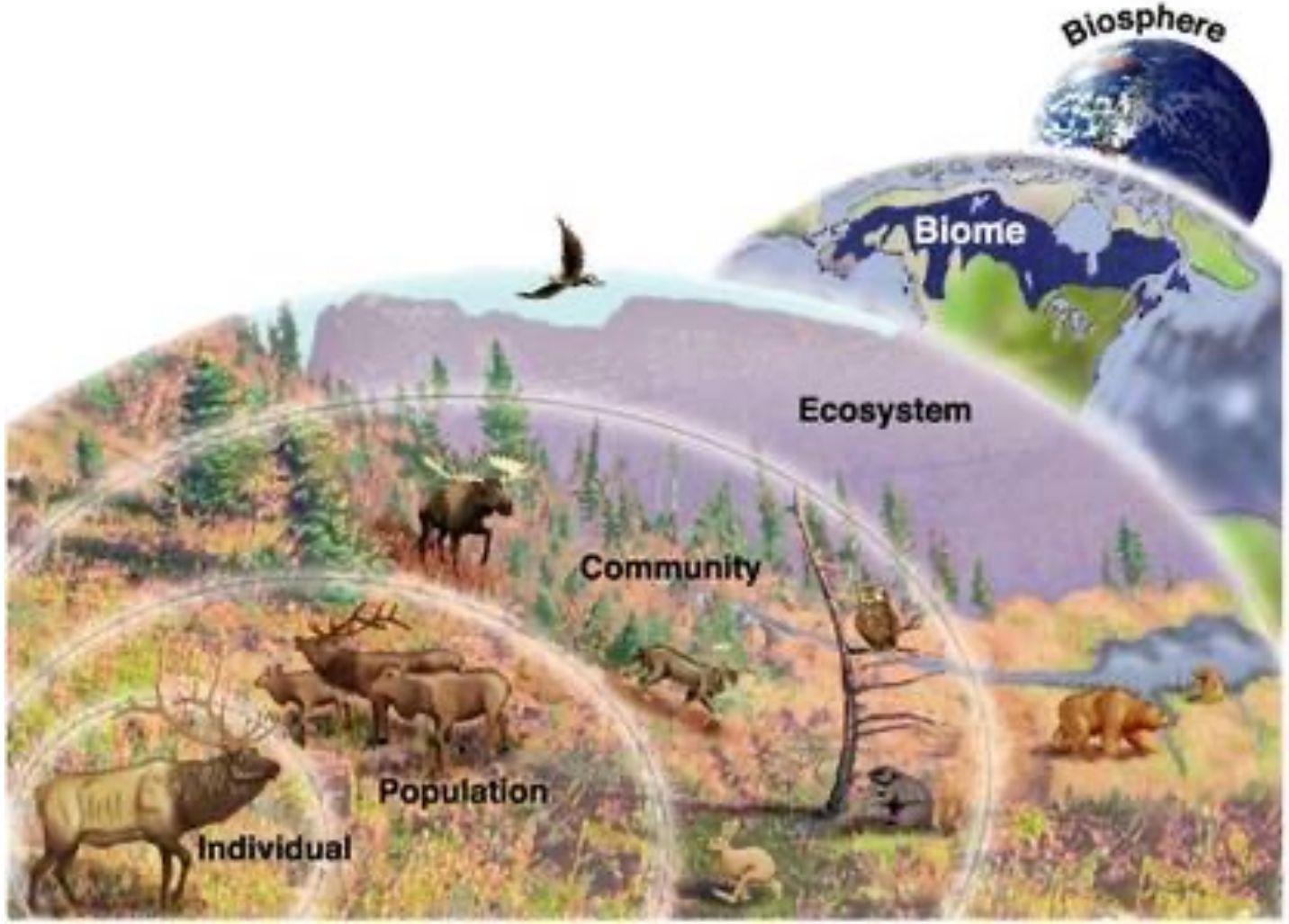
- What idea does the shape of an energy pyramid **most likely** reinforce?

A. In general, larger animals in an ecosystem eat smaller animals.
B. Plants use sunlight to obtain energy and form the basis for all food chains in an ecosystem.
C. Organisms at higher levels of a food chain live at higher levels in an environment.
D. The amount of available energy decreases as the energy passes from organism to organism.



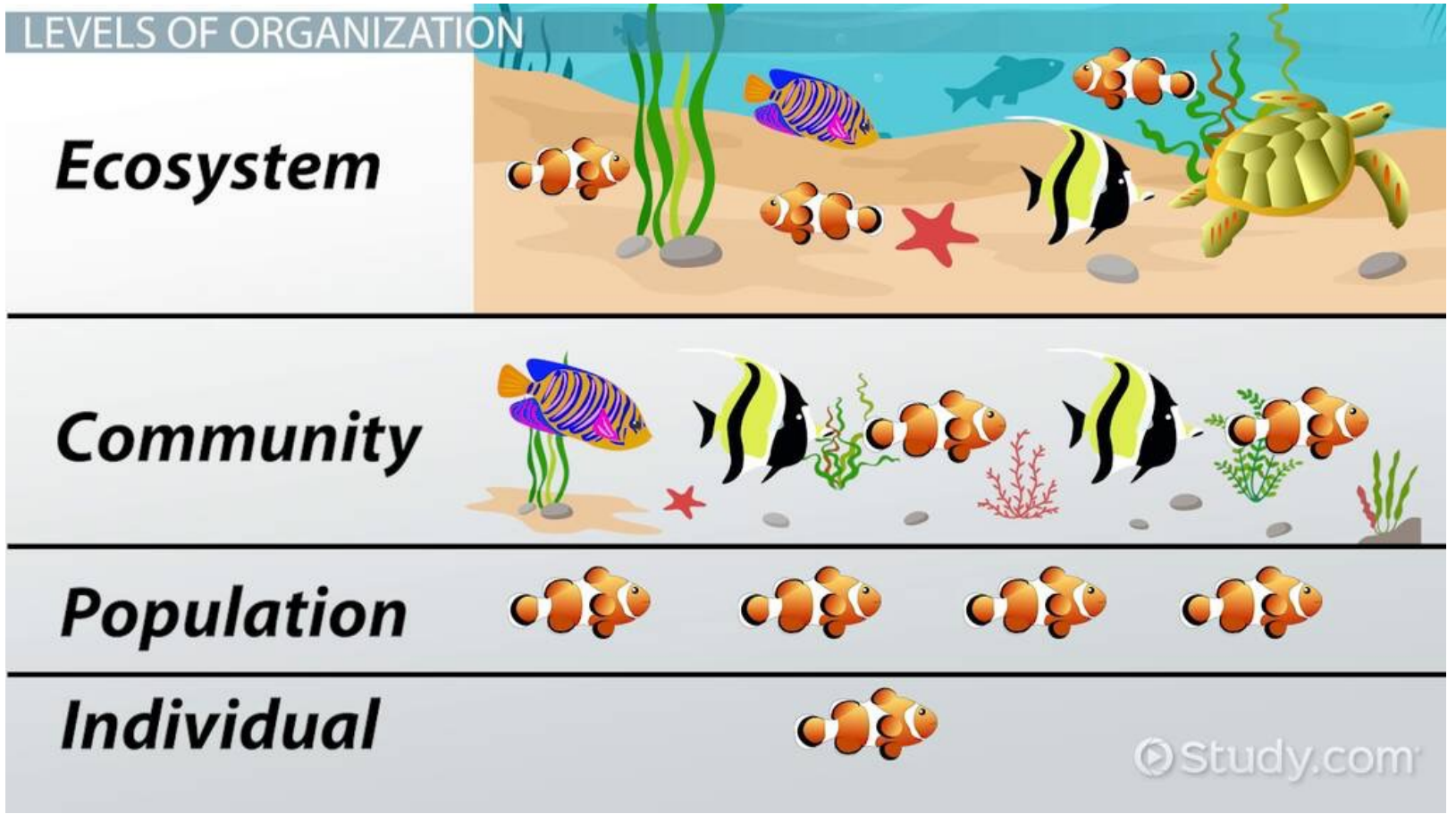
Levels of Organization in an Ecosystem

An ecosystem is made up of different kinds of living things. Scientists often think of the living things in an ecosystem as being organized in levels.



The lowest level of organization is the individual organism. Individual organisms are arranged into populations. A population is a group of organisms that are all the same species and that all live in the same area. For example, all the blue jays in a forest make up a population.

Populations are organized into communities. A community is all the populations in an area. Most communities contain many populations, and these populations affect each other in various ways. Groups of communities make up ecosystems.



Making Generalizations

- When you generalize, you use specific information to make a broad statement that applies to an entire group of objects, places, or events.
- A generalization can be valid or invalid. Valid generalizations are supported by facts and examples whereas invalid ones are not.

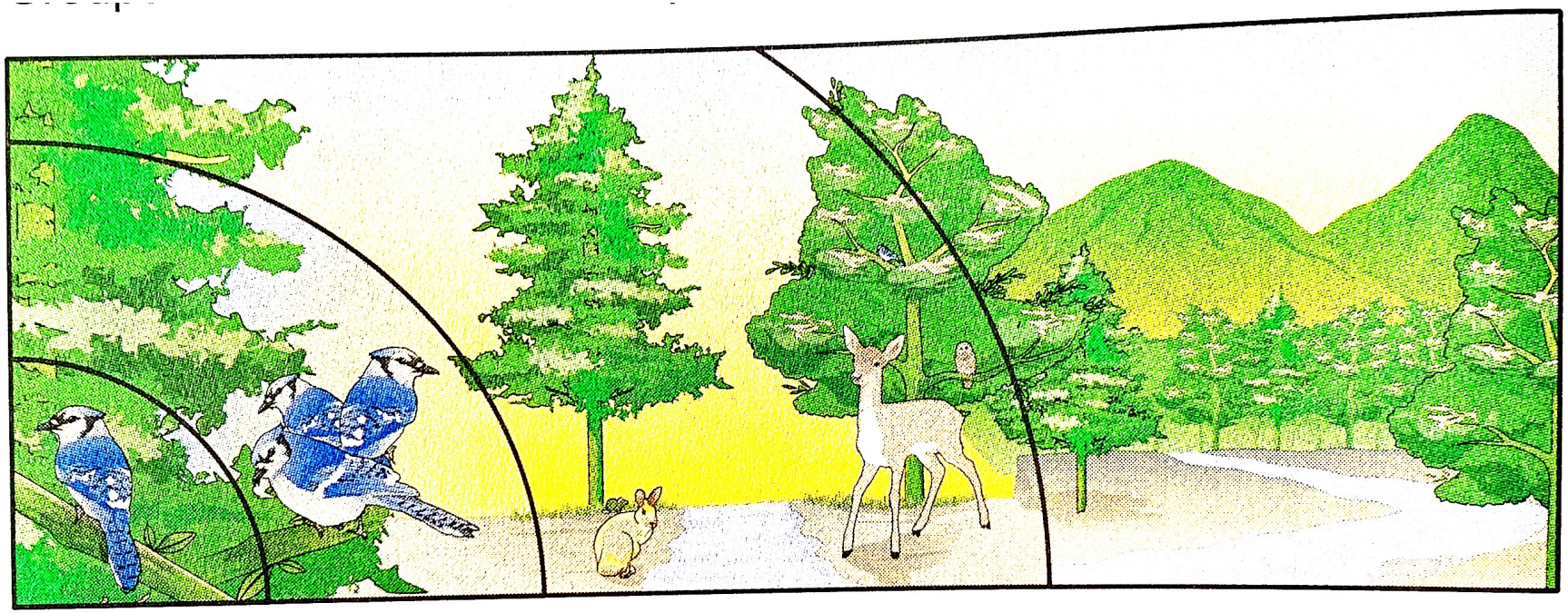
To make a generalization, first gather and compare information about a topic. Then use the information to make a statement that is usually true. This statement is your generalization.

Even if a statement describes all the members of a particular group, it is not necessarily a generalization. For instance, the statement that a community is all the populations in an area is a fact, not a generalization.

Generalizations – both valid and invalid – may contain key words such as *all, always, every,* and *never,* as well as *most, mostly, typically, often, overall, almost* and *usually.*

Based on the information, which statement is a valid **generalization** about the living things in an ecosystem?

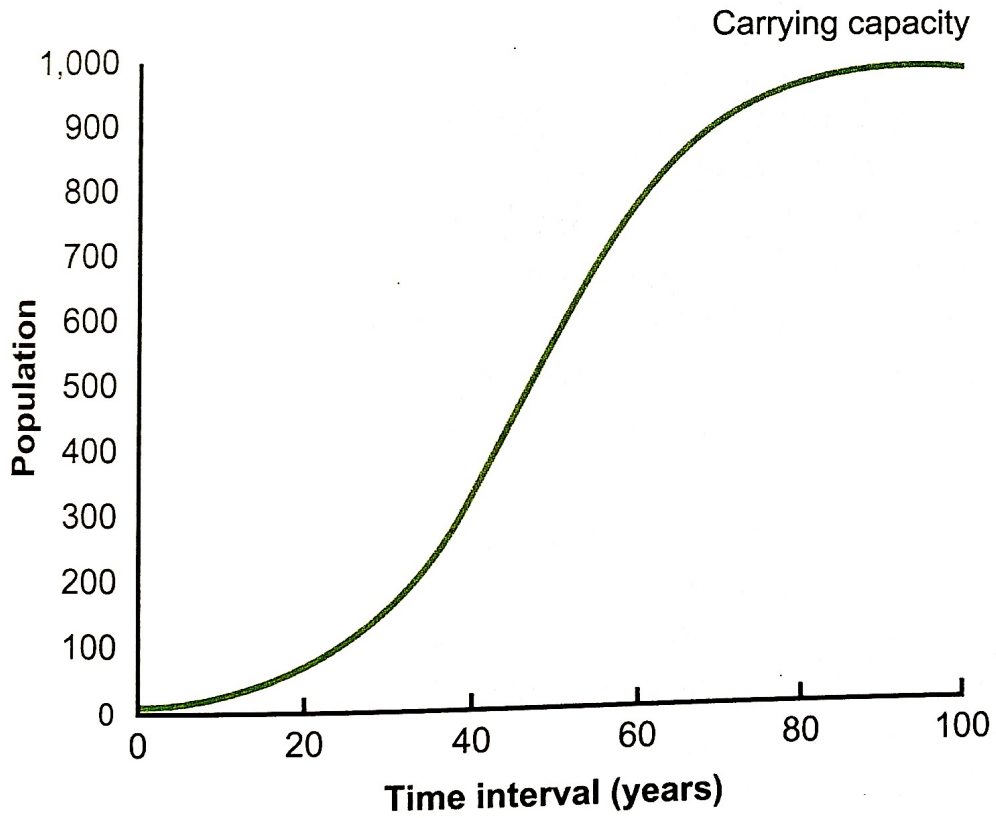
a. There are different kinds of living things in an ecosystem.
b. The communities in most ecosystems are made up of many different species.
c. Populations in an ecosystem are made up of individual organisms.
d. All organisms in a population are of the same species.



DIRECTIONS: Study the information and graph. Then complete each statement by filling in the box.

CARRYING CAPACITY

Carrying capacity is the maximum number of individuals of a given species that an area's resources can sustain. Competition for resources and many other factors can affect carrying capacities. The graph shows a pattern of change over time for one population in one ecosystem.



2. Based on the graph, a population generally

   [ ]

   until it reaches its carrying capacity.

3. The graph represents one population in one ecosystem. A generalization can be made that similar populations in similar ecosystems are

   [ ]

   between years 40 and 60.

4. Suppose that a new competitor of the population represented in the graph is introduced in the ecosystem. The graph would change by showing a generally lower

   [ ] .

Representing Data

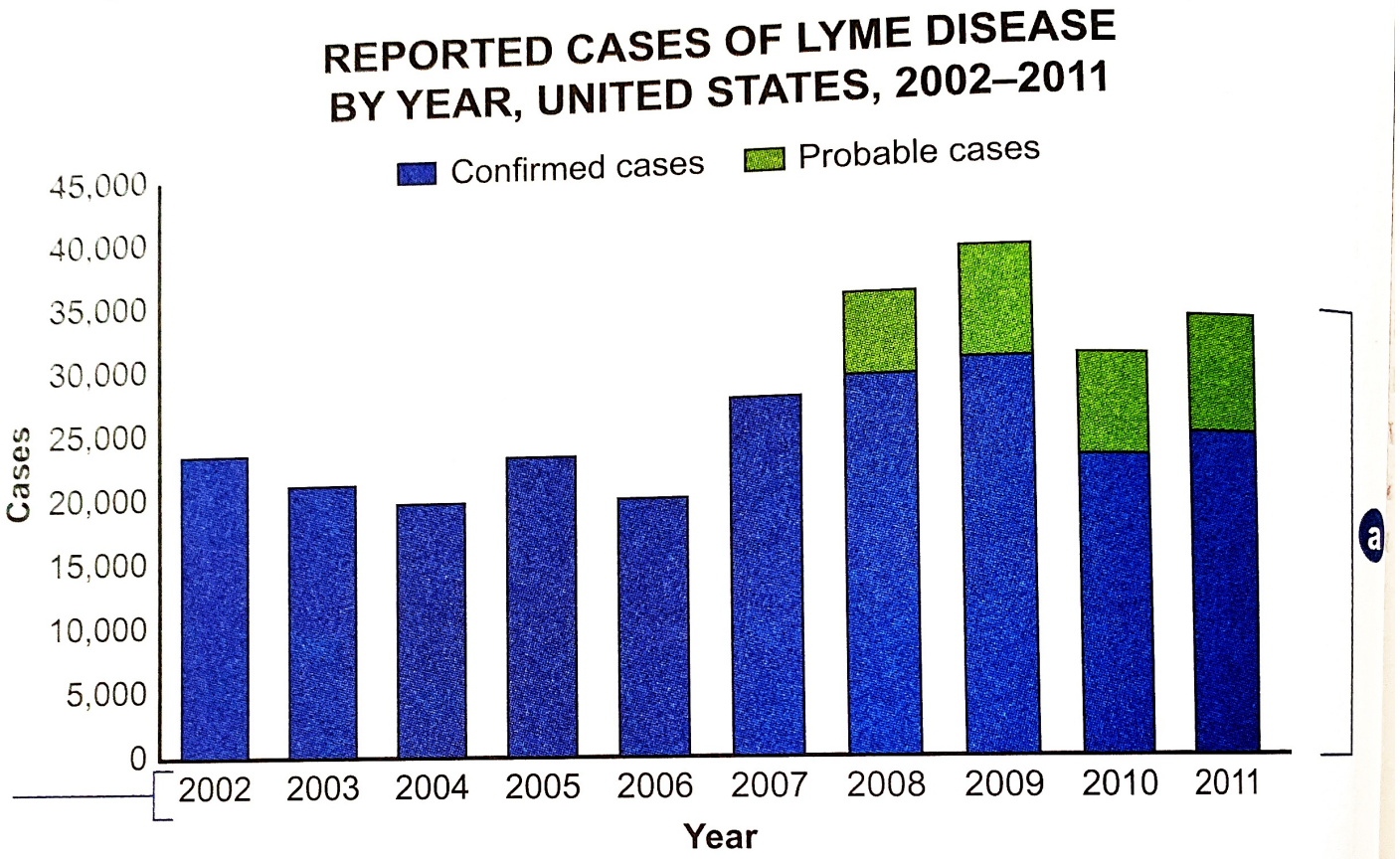
What are some ways we can represent data?

How do graphs, maps and charts help to compare and contrast data?

What types of graphs and charts do you know?

Bar Graphs:

- A bar graph may be stacked, having bars that are divided to show subcategories. In this graph, the two subcategories are confirmed and probable cases.
- A bar graph compares data. This graph compares the number of cases of Lyme disease reported each year over a 10-year period.

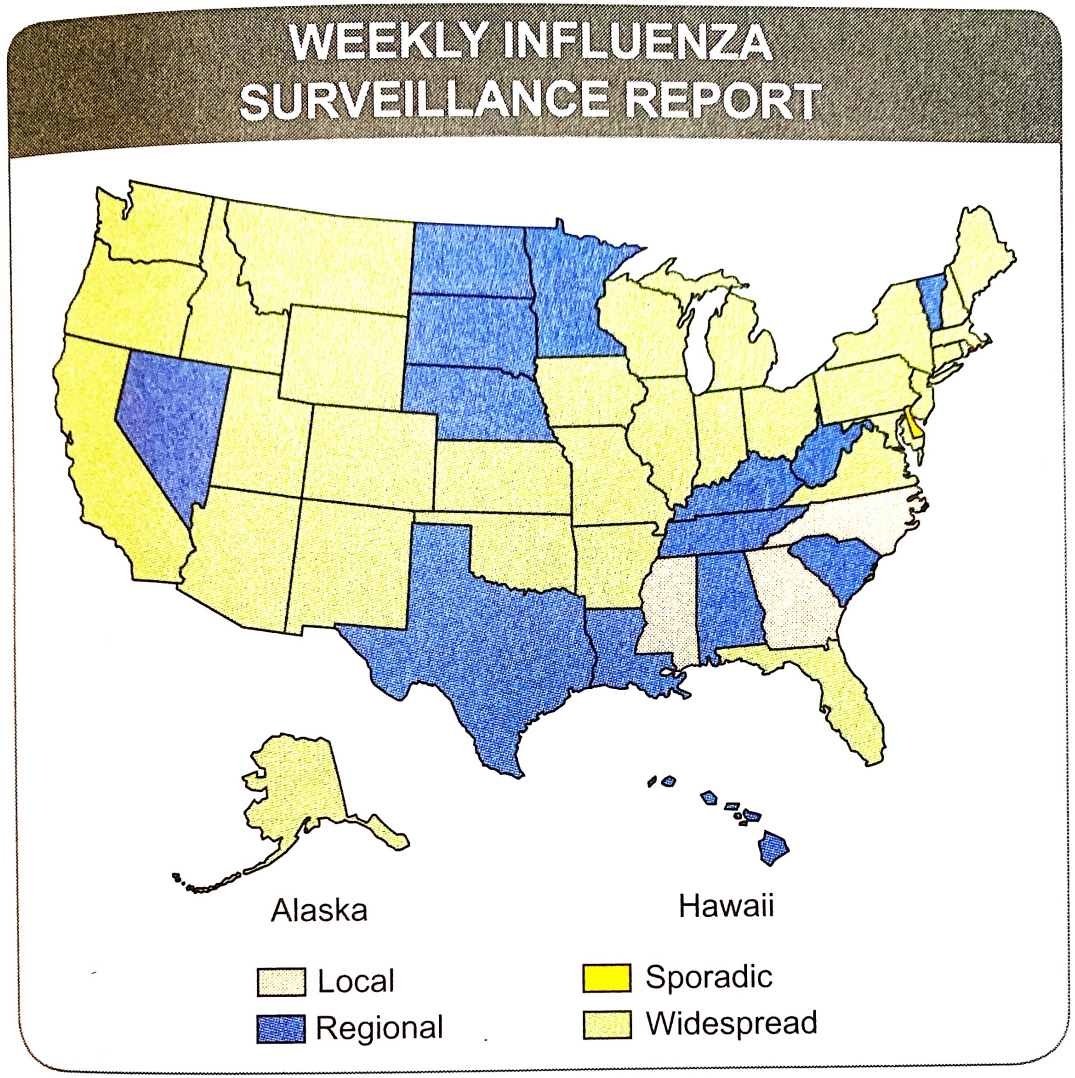


Source: Centers for Disease Control and Prevention

1. According to the graph, in which year were the most confirmed and probable cases of Lyme disease reported?

   A. 2007
   B. 2008
   C. 2009
   D. 2010

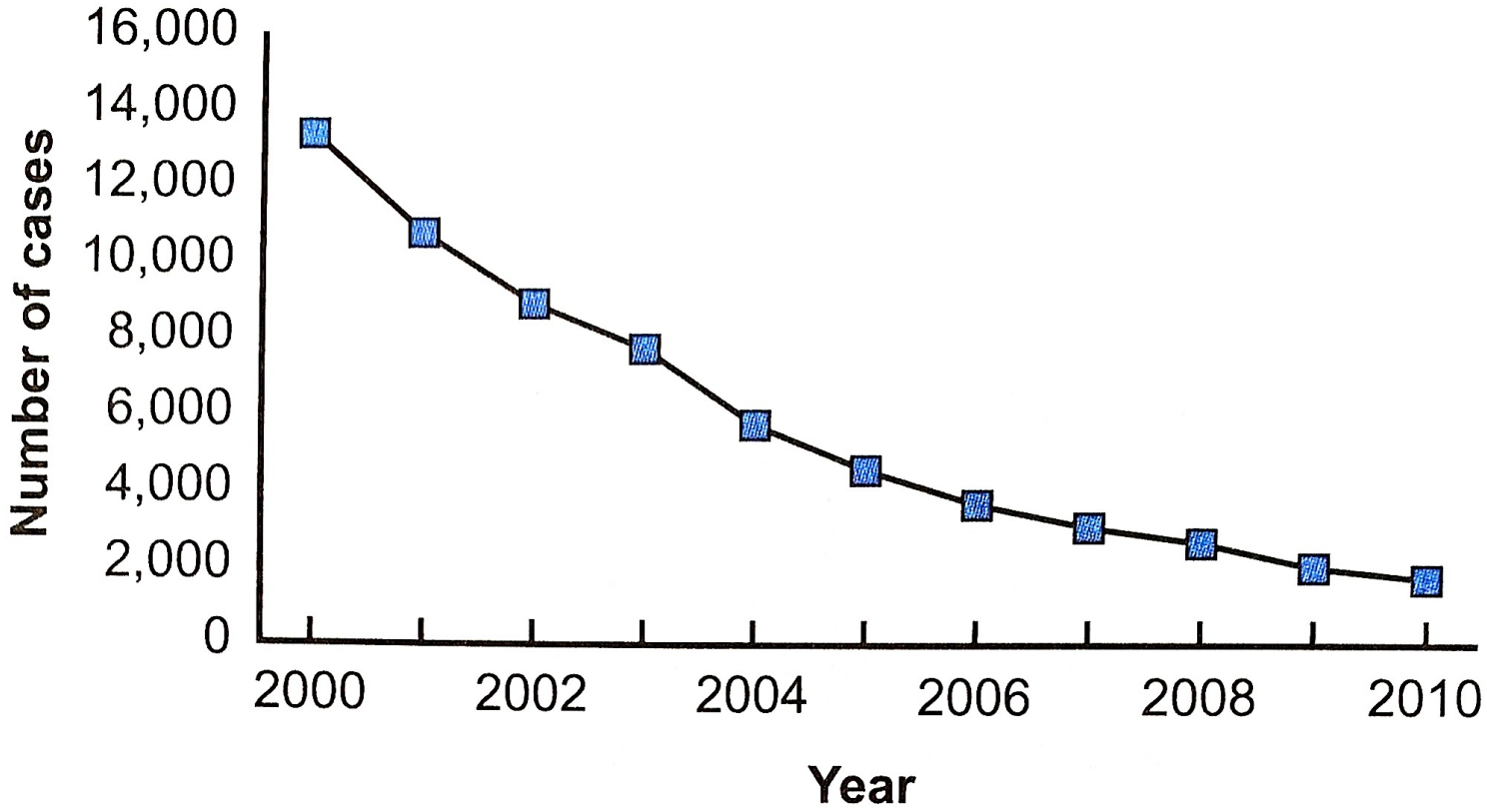
Maps:



2. Which category of geographic spread of the flu applied to the most states during the week addressed by the map?

A. sporadic
B. local
C. regional
D. widespread

ACUTE HEPATITIS A CASES, UNITED STATES, 2000–2010



Source: Centers for Disease Control and Prevention

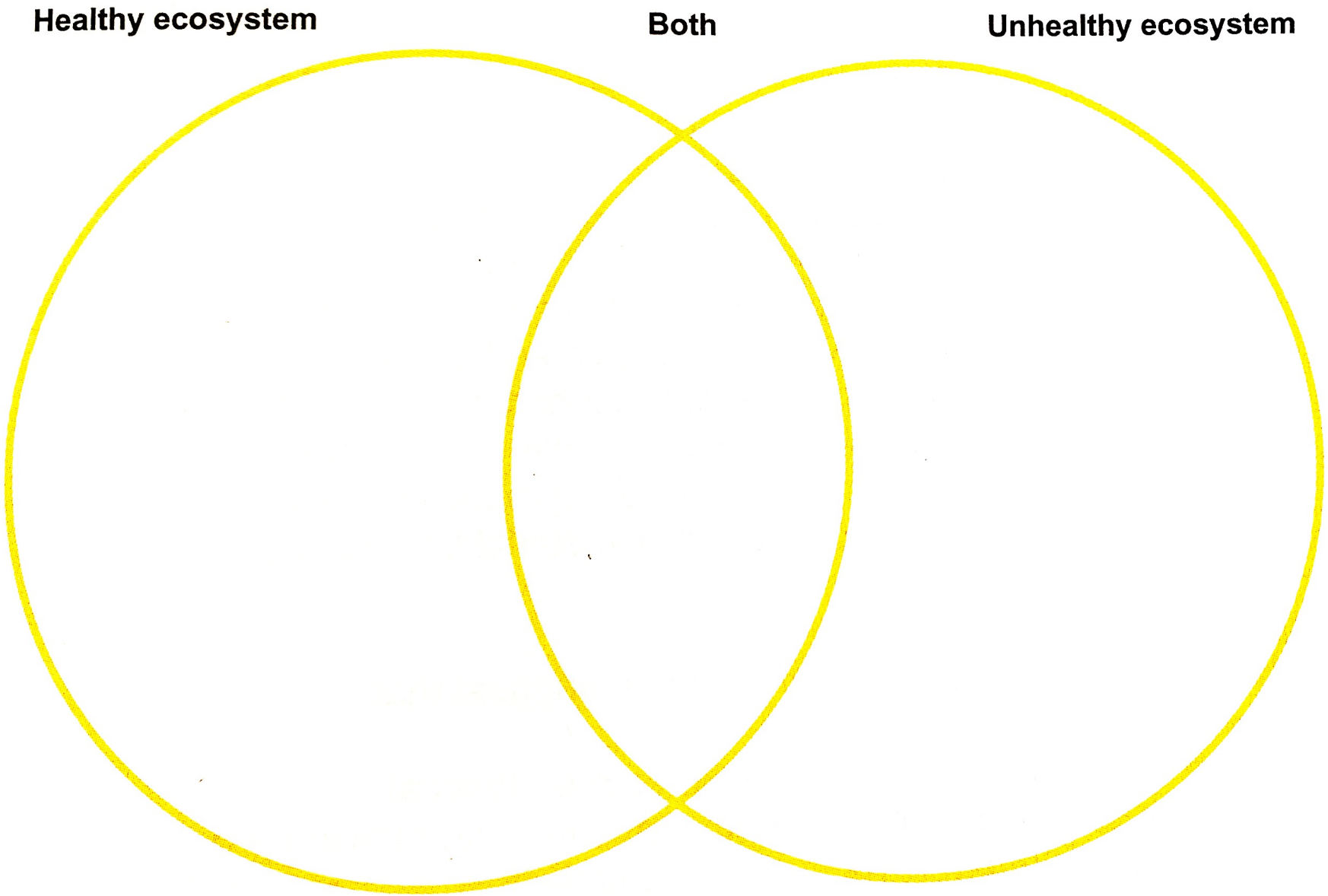
3. Based on the graph, which statement describes the trend in the occurrence of hepatitis A cases in the United States between 2000 and 2010?

   A. The number of cases decreased.
   B. The number of cases stayed the same.
   C. The number of cases increased.
   D. The number of cases doubled.

4. Which assumption could be supported by the passage and the trend shown in the graph?

   A. The number of viral infections is increasing due to fewer prevention options.
   B. The hepatitis A virus is becoming weaker and less contagious.
   C. Greater knowledge about control of the spread of hepatitis A has led to fewer infections.
   D. Fewer people are going to the doctor when they have symptoms of hepatitis A.

Venn Diagram: compare and contrast healthy and unhealthy ecosystems with the options below



Drag-and-Drop Options

living and nonliving parts
correct proportions of nutrients and sunlight
loss of habitat
nonnative species
high level of biodiversity
polluted water

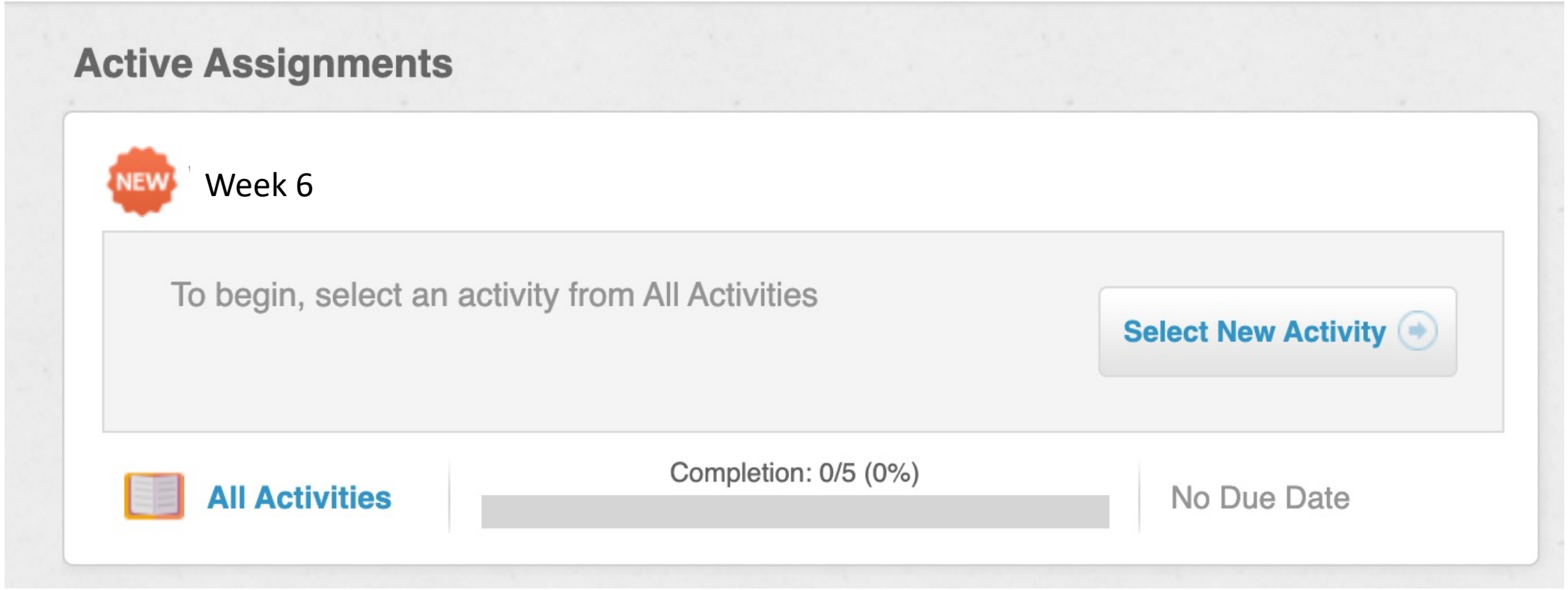
- What are some ways we can represent this data?
- What is this data “telling us”?

Populations of Selected North American and Caribbean Countries

Country	Population Estimate
United States	321,234,000
Mexico	121,006,000
Canada	35,819,000
Cuba	11,252,000
Haiti	10,994,000
Dominican Republic	9,980,000

Data from https://en.wikipedia.org/wiki/List_of_North_American_countries_by_population on 9/7/17

Homework!


Active Assignments
NEW
Week 6
To begin, select an activity from All Activities
Select New Activity
All Activities
Completion: 0/5 (0%)
No Due Date