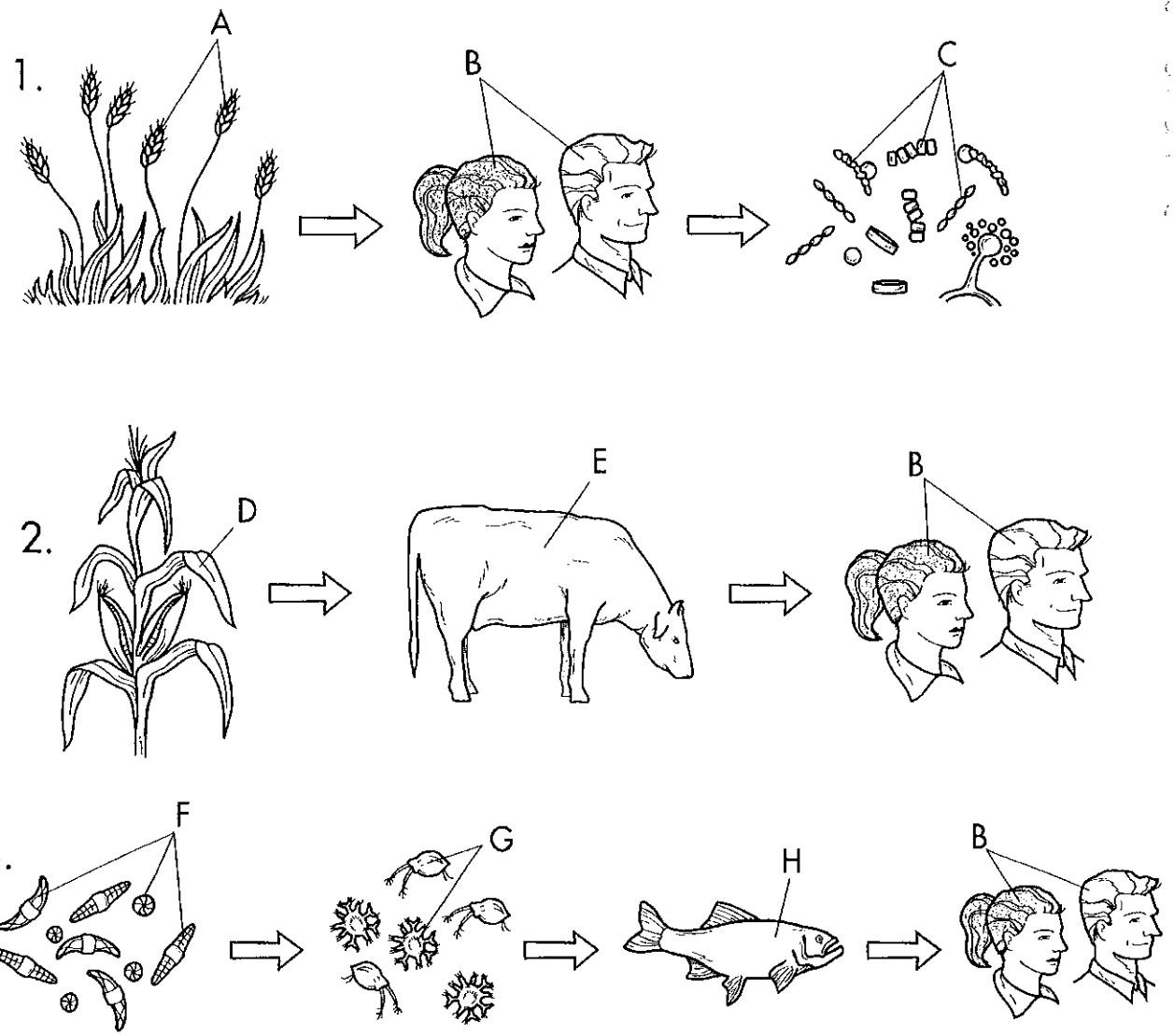

Food Chains

○ Rice Plants .....A	○ Corn Plants .....D	○ Phytoplankton .....F
○ Humans.....B	○ Beef Cattle .....E	○ Crustaceans .....G
○ Microorganisms.....C		○ Fish.....H

Chapter 11-7: Food Chains

The food chain accounts for the flow of energy and the cycling of matter in an ecosystem, and is one of the processes that unites communities within ecosystems. Organisms derive energy and nutrients through the dynamics of the food chain, as we will see in this plate.

> Looking over the plate, you will note that we present three different food chains. Each is a series of linkages in which we identify the individual organisms. You can compare these to the trophic levels in an energy pyramid, which are made up groups of organisms.

In general, plants are eaten by animals which are in turn eaten by other animals. In the first diagram, we show a highly simplified food chain that involves humans. Each link in the food chain is a trophic level.

In the first food chain, we start by looking at a **rice plant (A)**. Plants are autotrophs, which means that they use photosynthesis to produce their own food. In the food chain, autotrophs are producers; they use the sun's energy to produce carbohydrates, which are rich in energy. Rice plants also absorb minerals from the soil to produce inorganic matter for use by other organisms.

Humans (B) feed on the rice plants, and occupy the second trophic level. They are heterotrophs because they consume organic matter rather than producing it themselves, and are acting as herbivores because they consume plants. In this case, they are also the primary consumers, because they are feeding directly on the autotrophs.

The next organisms we see in diagram 1 are **microorganisms (C)**. After humans die, microorganisms feed on their decaying bodies. These microorganisms, which include bacteria and fungi, are also called decomposers or detritivores, since they feed on detritus. The decomposed matter becomes nutrients in the soil that are consumed by the autotrophs, returning them to the food chain.

> You should now have some idea of how the food chain operates. One organism feeds on autotrophs, and then becomes food for another organism. We will study a second food chain in diagram 2, in which humans play a different role. Continue your coloring as you read the following text.

In the second food chain, shown in diagram 2, the autotroph, or primary producer, is a **corn plant (D)**. The corn plant provides food for the primary consumers, which in this case are **beef cattle (E)**. The cattle, in turn, are food for humans (B). In this chain humans are acting as carnivores, since they eat meat. They are also secondary consumers in the food chain, and occupy the third trophic level. Since humans are herbivores in the first food chain and carnivores in the second, you can see that they are able to feed at several trophic levels; in other words, they are omnivores.

> We now focus on a third food chain, one that exists in the ocean. Once again, humans are involved, but they occupy a high trophic level. Continue your reading below as you color the third diagram.

In the third section of art, we show a typical oceanic food chain. Here the autotrophic producers are microscopic organisms called **phytoplankton (F)**. Phytoplankton are food for a number of microscopic, insect-like **crustaceans (G)**, which are food for **fish (H)**, which are the secondary consumers in the food chain. Humans (B) are at the fourth trophic level, and are tertiary consumers.

Much energy is lost as it travels from producers to tertiary consumers, so the fourth food chain is the least efficient—it contains the most participants. Unfortunately, humans could not subside on phytoplankton or crustaceans, which are low on the food chain.

These food chains are simplifications of the relationships inherent in ecosystems because many different organisms feed on producers and consumers along the chain. In addition, a consumer may be both a herbivore and a carnivore. The tangled mass of interconnections that evolves as a result of this is the food web.

11.7 Food Chains

1. The food chain accounts for the _____ and the _____ in an ecosystem.

2. What is another name for a link in a food chain? _____

3. What are two names for an organism that uses photosynthesis to make its own food? _____

4. What is the specific name for a consumer that feeds directly on autotrophs? _____

5. What are two types of microorganisms that feed on decaying bodies? _____

6. What are two names for microorganisms that feed on decaying bodies? _____

7. What happens to decomposed matter? _____

_____

8 What do we call consumers, such as humans, that are able to feed at several trophic levels? _____