Food Chains

Objective: Students will understand how energy is passed through trophic levels, starting with the sun.

Summary: Students will become members of a food chain and find the other links in their chain.

Time: ½ hour

Student Grouping: Three, four and/or five

Materials: Food chain cards* (see page 81)

Background Information:

It is possible to trace the foods we eat (and everything we use) back through a series of energy transformations to the sun's energy. This is a simple food chain: Sun, soil, air and water providing the energy for plankton (microscopic plants and animals that live in the sea). Plankton, in turn, are the food source of clams. Clams are eaten by people and otters. Sharks can eat people and otters! Another example might be the sun providing the energy for grass to grow, the grass feeding a dairy cow, that cow producing milk that people drink. In this activity students gain some awareness of the connections that exist between organisms.

Marin Ag. Facts: Did you know that oyster harvesting was one of the first agricultural industries in Marin County, dating back to the 1870s? Most of the oyster farms are in Tomales Bay and Drakes Estero. Clams are found in Marshall, where many people dig them for sport. In 2006, 7 growers used 1,400 acres of bay bottom (mostly Tomales Bay) to grow approximately 8,000,000 lbs. of shellfish (oysters, clams and mussels), worth about $2.5 million. Bay Area restaurants and grocers buy these fresh shellfish. Some of our local enterprises sell only from their watery farm, counting on people to stop in and buy their shellfish, thus saving money on transportation and complicated packaging. You can also buy these delicacies from the deep at the Farmer's Market.

Preparation:

1. Photocopy the food chain cards and cut them up. Enlarge and laminate, if desired.
2. Count the students and be sure you distribute chains that can be completed. The chains vary in length, and you can always leave out the last chain member. In this way they will always be adaptable to any class from three to 40 students.

Procedure:

1. Distribute the food chain cards, telling students not to show anyone the new identity they have been given. Ask them to consider this identity and think about who might use this particular food chain member for food, and what food they might need. If your cards are not laminated, you can have students color the picture as they take on their new "identity."
2. Discuss food chains with your students. Ask them where milk comes from and what cows eat. Have students sketch a sample food chain on the board as you discuss the various steps in producing milk.
3. Tell students to mingle around the room and find the other members of their food chain among the other students. Instruct students not to talk. This helps them concentrate and discover their food chain for themselves. They may show their card to everyone, but must find the other members of their food chain and put themselves in order without talking. If there is some confusion and no one picks up on the unique borders*, point it out to several students.
4. Once everyone has found their position, each group shares what they are and how they fit in their food chain.
5. Ignore the borders and see how many other food chains can be made. See how the chains can cross and intermingle.

Questions for Discussion:

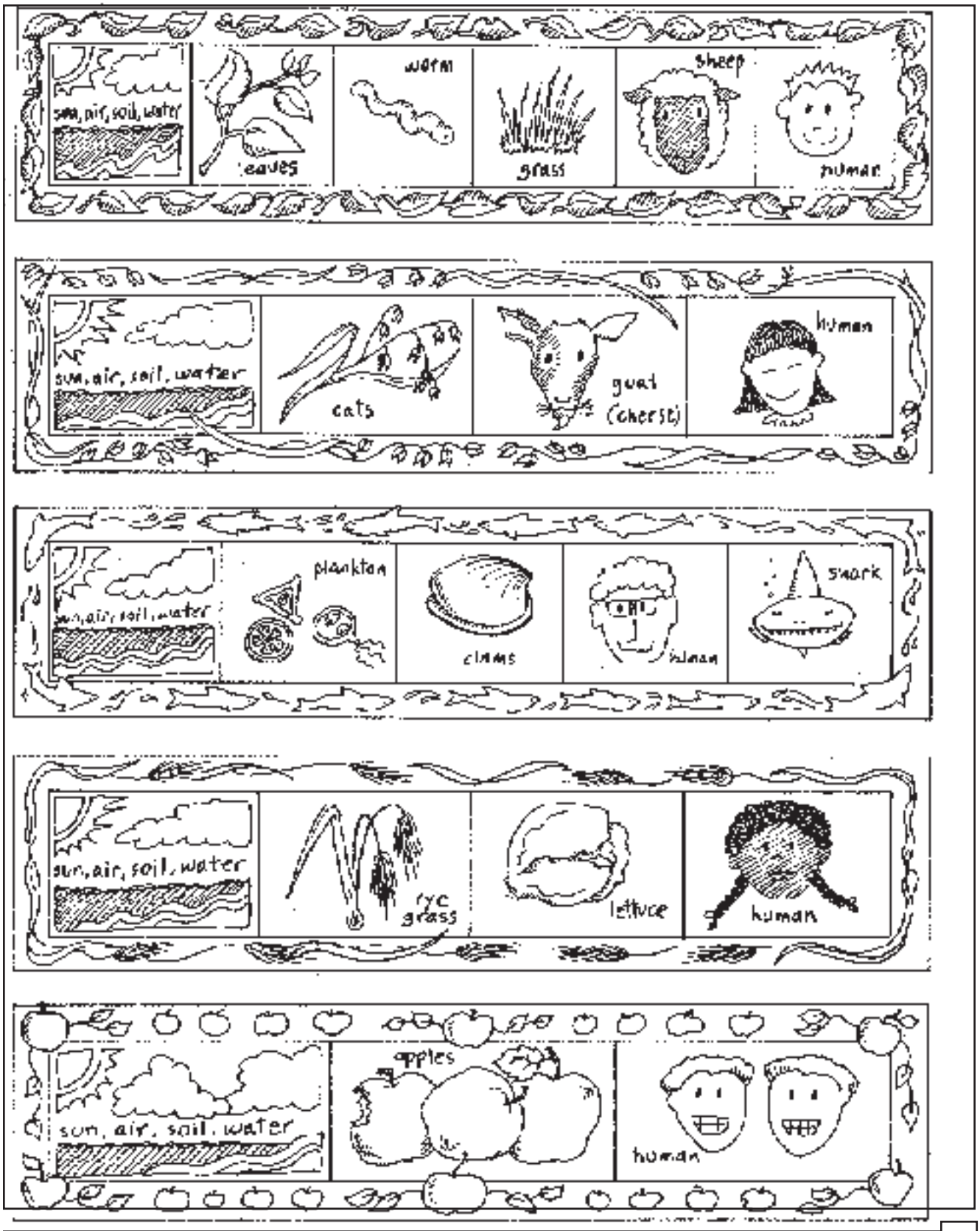
- Think of an item in your lunch. What is the food chain that created the bread for your sandwich? The milk?
- How many plants does it take to support a plant-eater? How many plants support a meat-eater?

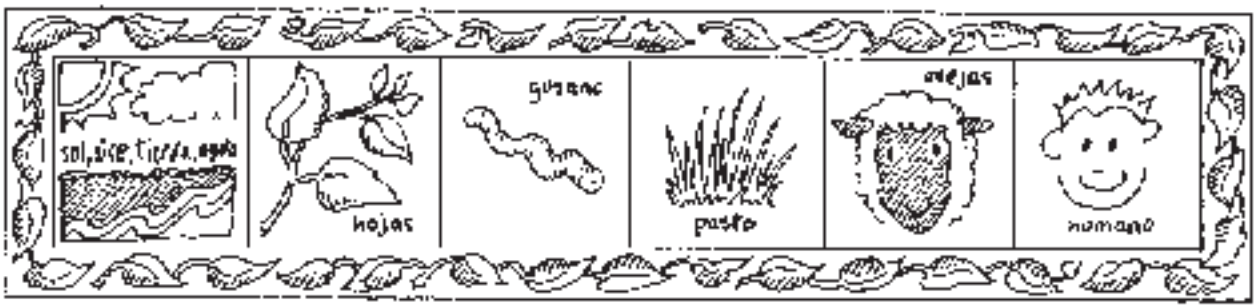
Extensions:

- Put together a model food chain in the classroom. Some possibilities would be a terrarium with sunlight, earthworms, plants and grasshoppers, or grass, crickets and a lizard.
- Cut out magazine and calendar pictures instead of using the cards provided. Have each student pick a card and then make up food chains. Paste the pictures on a large sheet of butcher paper and make links with yarn between "eaters and eaten."
- Take students outside or on a field trip and ask them to observe food chains. Have them take notes on their observations, then research, dramatize and/or illustrate these chains in the classroom.
- Select some food and clothing items (carton of milk, wool sock, piece of lamb, some raw oysters) for the students to explore. Discuss each material's origins. Have students research and discuss the life story of the sample objects. Provide reference materials for finding this type of information.

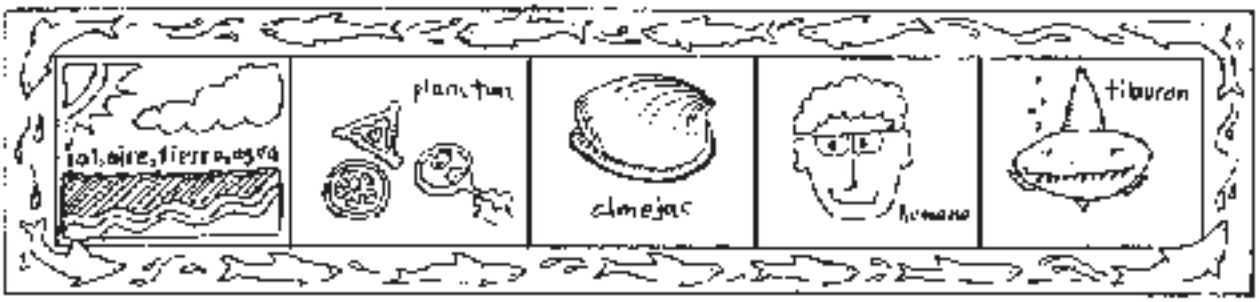
* **Note:** Each series of food chain cards will have a unique border, thus facilitating students' ability to find their fellow food chain members. The activity can be done without the borders but becomes confusing because of overlap. Enlarge your food chain cards on a photocopier to a suitable size for your students.

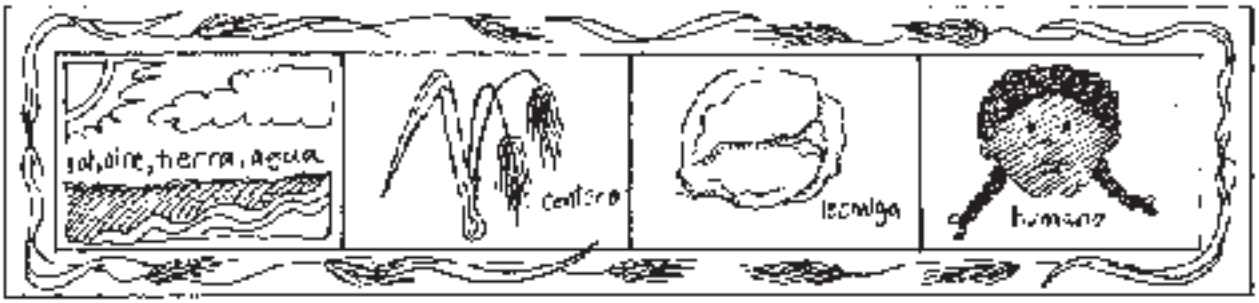
Idea from "Conserve and Renew Energy Education Activities for Grades 4-6."

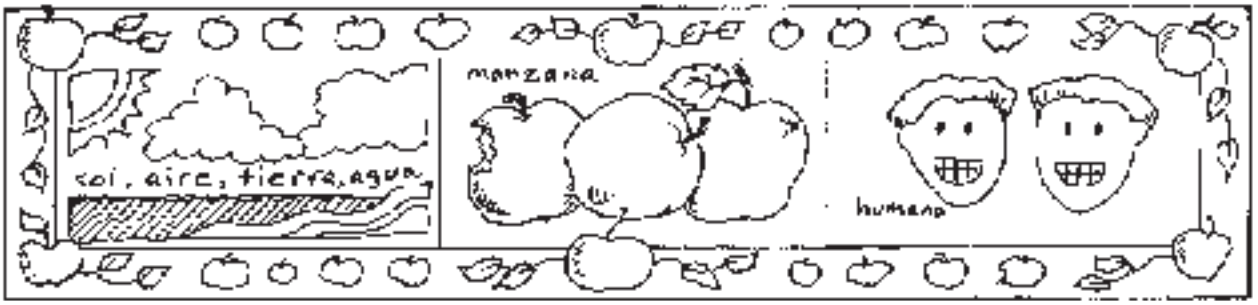

sun, air, soil, water
leaves
worm
grass
sheep
human
sun, air, soil, water
cats
goat (cheese)
human
sun, air, soil, water
plankton
clams
human
shark
sun, air, soil, water
rye grass
lettuce
human
sun, air, soil, water
apples
human

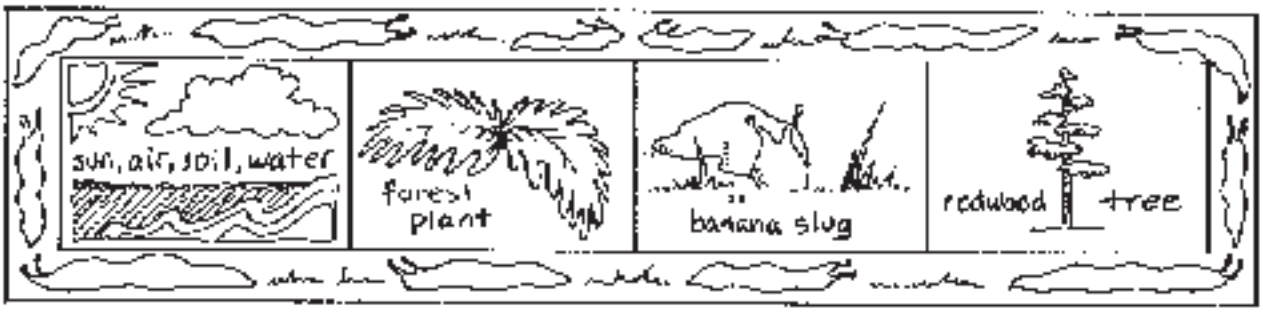

sol, aire, tierra, agua
hojas
gusano
pasto
ovejas
humano

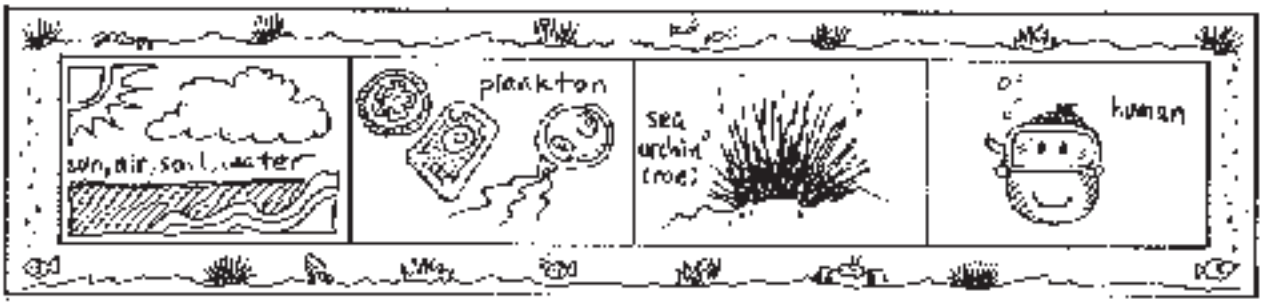

sol, aire, tierra, agua
avena
cabra
(queso)
humano

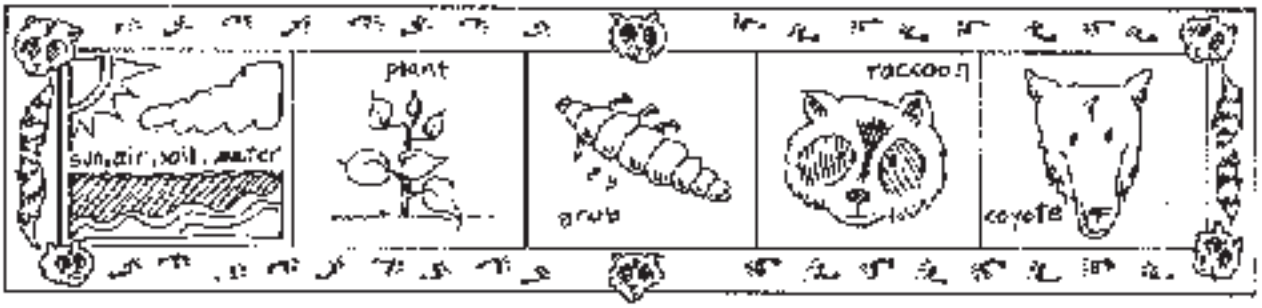

sol, aire, tierra, agua
plancton
almejas
humano
tiburon

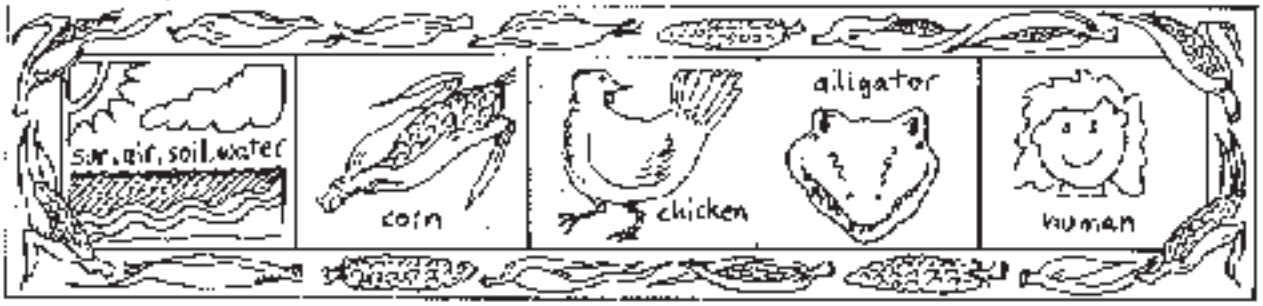

sol, aire, tierra, agua
centeno
lechuga
humano

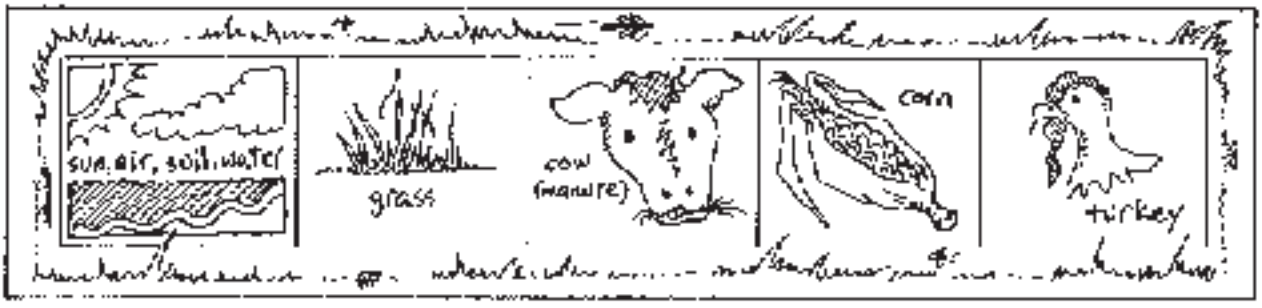

sol, aire, tierra, agua
manzana
humano

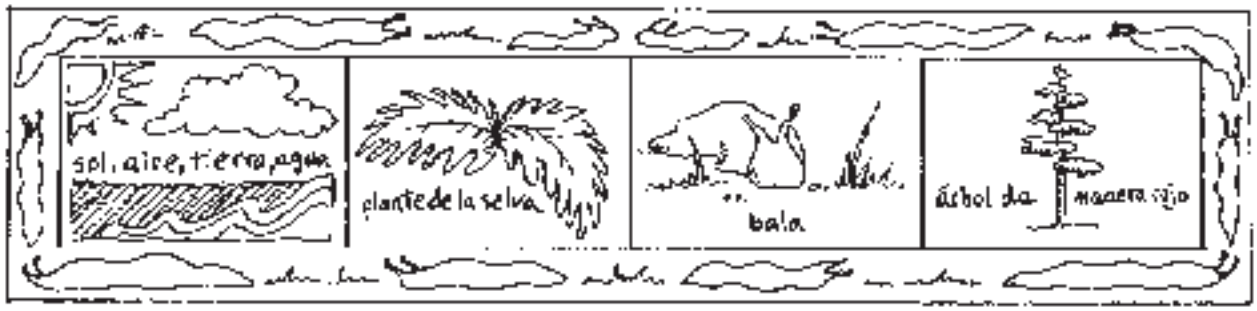

sun, air, soil, water
forest plant
banana slug
redwood tree

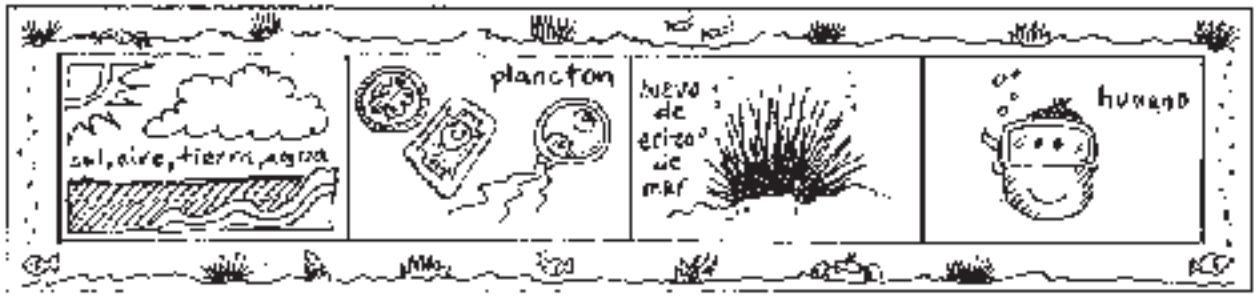

sun, air, soil, water
plankton
sea urchin (roe)
human

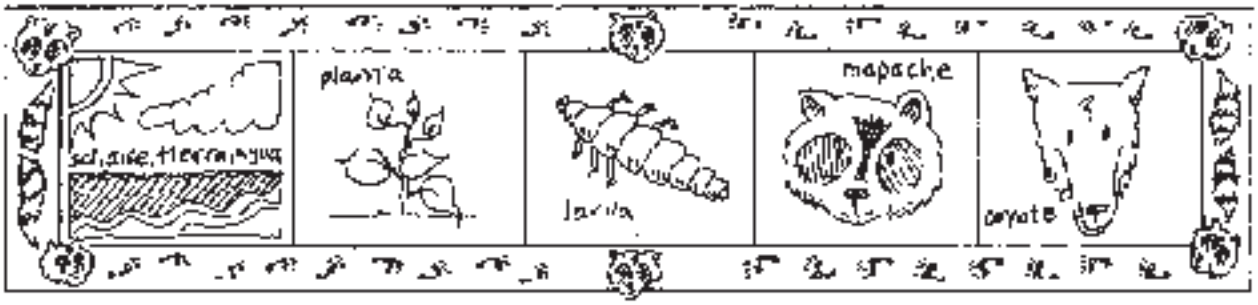

sun, air, soil, water
plant
grub
raccoon
coyote

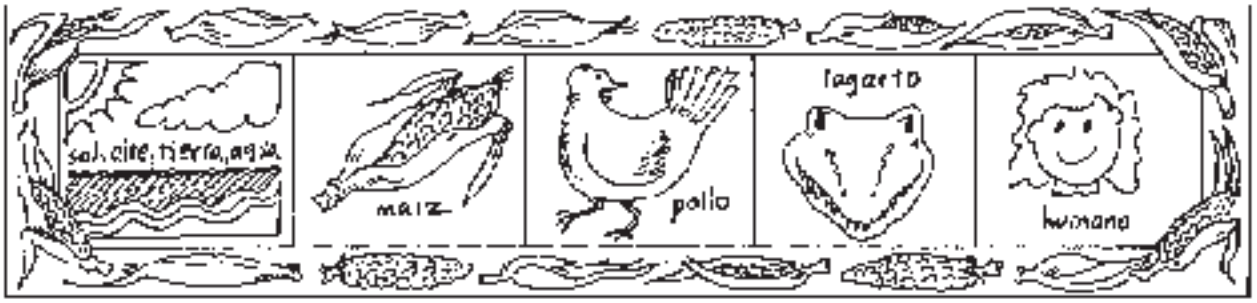

sun, air, soil, water
corn
chicken
aligator
human

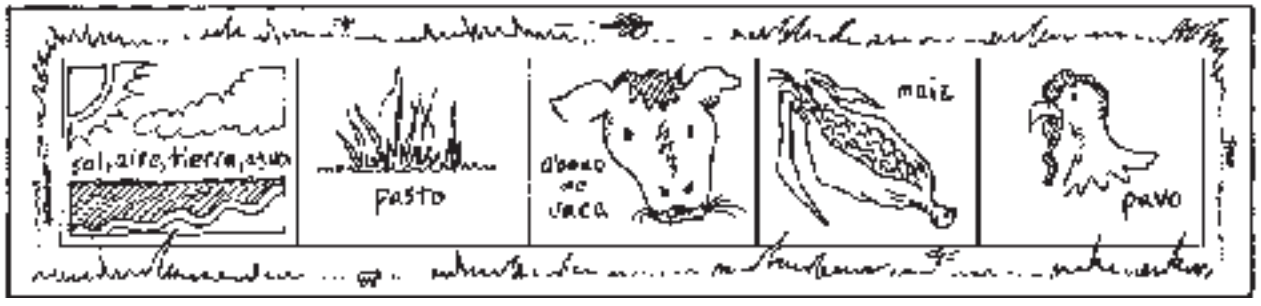

sun, air, soil, water
grass
cow (manure)
corn
turkey

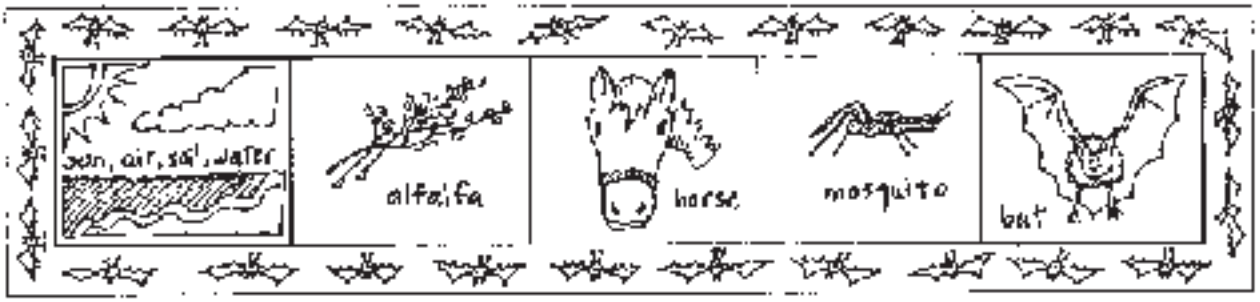

sol, aire, tierra, agua
planta de la selva
bala
árbol de manzanas rojo

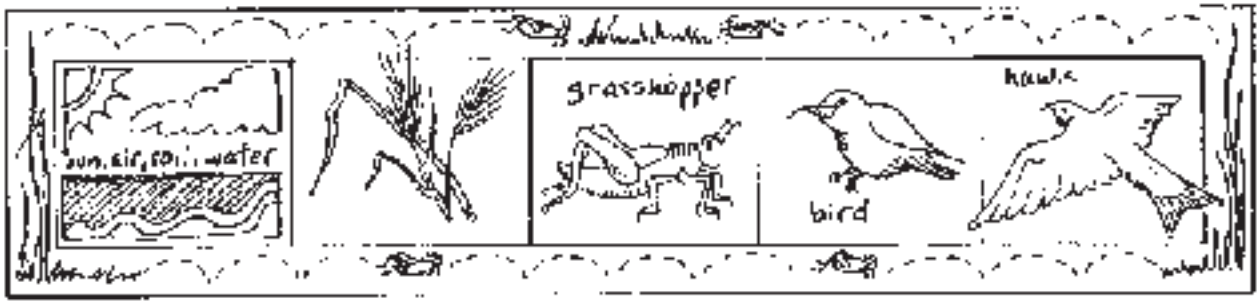

sol, aire, tierra, agua
plancton
huevo de erizo de mar
humano

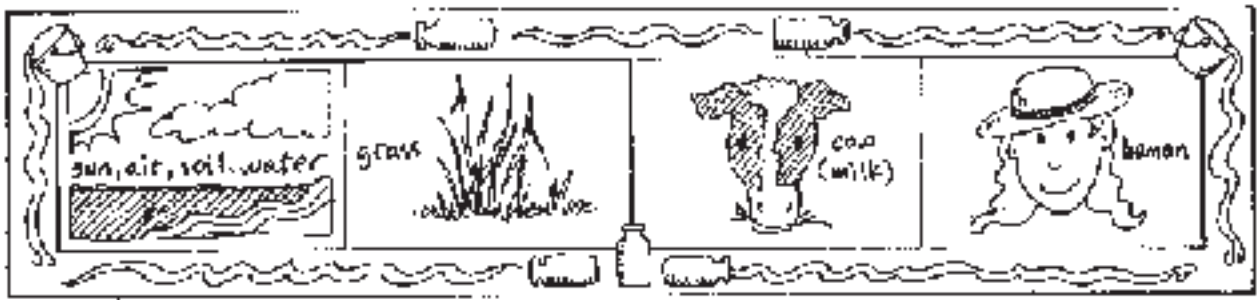

sol, aire, tierra, agua
planta
larva
mapache
coyote

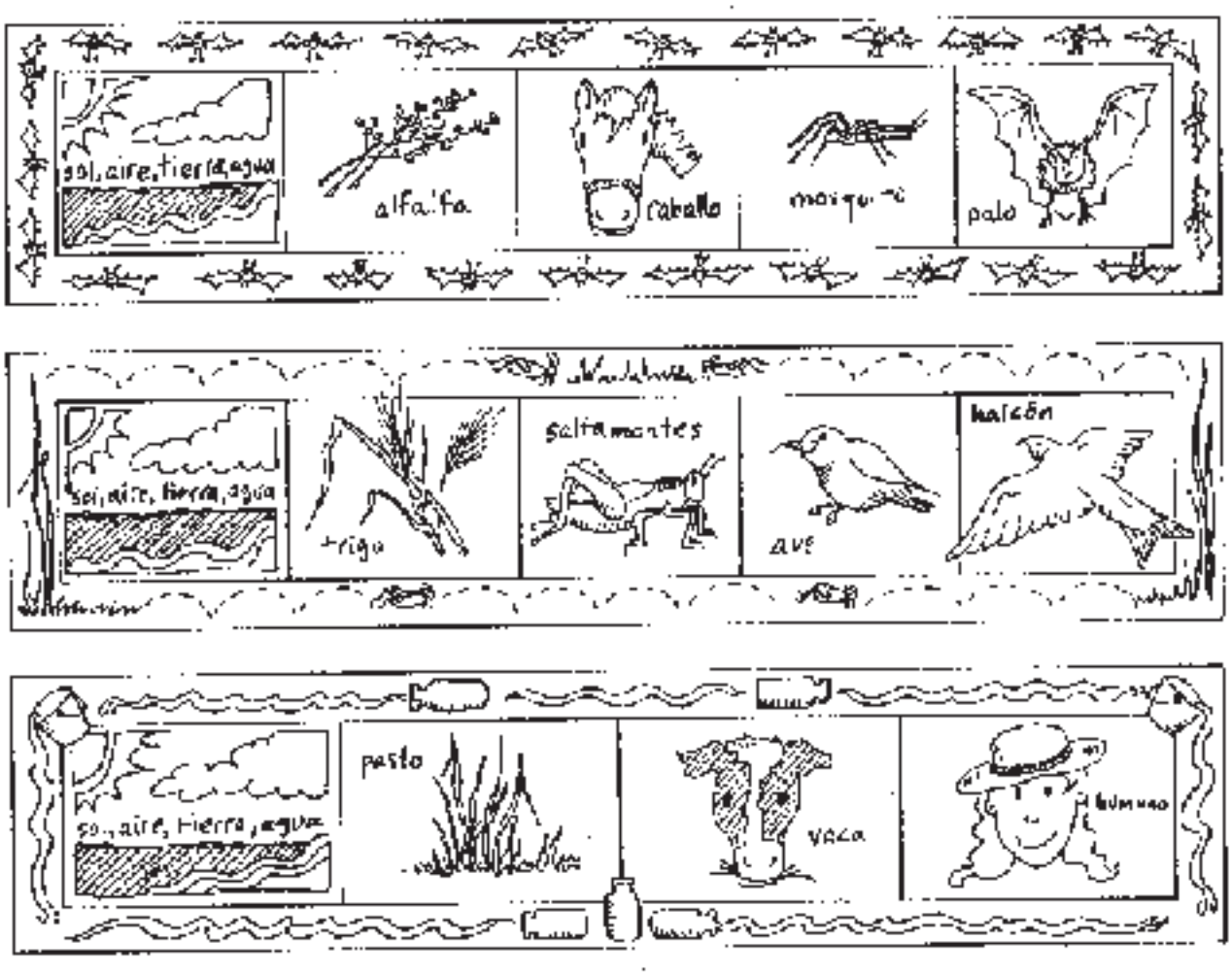

sol, aire, tierra, agua
maiz
pollo
lagarto
humano


sol, aire, tierra, agua
pasto
bebé de vaca
maiz
pavo


sun, air, soil, water
alfalfa
horse
mosquito
bat


sun, air, soil, water
grasshopper
bird
hawk


sun, air, soil, water
grass
cow
(milk)
human


sol, aire, tierra, agua
alfalfa
caballo
mariposa
palo
sol, aire, tierra, agua
trigo
saltamontes
ave
halcón
sol, aire, tierra, agua
pasto
vaca
humano