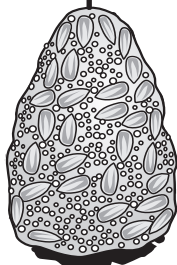


Investigating the Food Production Department

Name: _____



The BIG QUESTION:

What can you do to restore the food department in your ecosystem?



FOOD PRODUCTION

An eco-service provided by ecosystems throughout Garden Earth

Did you know that the Earth's ecosystems provide food _____ for all creatures, including us? Plants are just one strand of the food web, but most animals _____ rely on plants somewhere along the line. The Food Production Department is in danger, though. Deforestation from cutting down trees, monoculture farming such as coffee _____ and pine plantations, overpopulation of people around the world, pesticides in the environment, _____, and other forms of pollution all affect the food that creatures around the world eat.

Your task is to learn all you can about the Food department.

Write the Spanish translation every time you see a blank after a word.





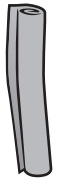


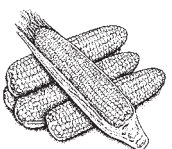






English	Spanish
Bird	Pájaro
Migration	Migración
Coffee	Café
Food	Alimentos
Animals	Animales
Plant	Planta
Environment	Ambiente
Ecosystem	Ecosistema



Remember: Write the Spanish translation every time you see a blank after a word.

Plant Parts for Lunch!



The majority of foods we eat come from plants. Food comes from different plant parts such as leaves, seeds, and roots. Match the food with the part of the plant _____ you think it comes from. Check your answers at the bottom of the page.

FOOD	PLANT PART	FOOD
 Broccoli	Flowers Leaves Roots Bark (trees) Seeds Fruit	 Lettuce
 Mango		 Cabbage
 Cinnamon		 Coffee
 Chocolate		 Corn
 Tomato		 Rice
 Sweet potato		 Watermelon
 Carrot		 Cauliflower

Food Production Department Funnies



Why do birds fly south for the winter?

Because it's too far to walk!



What do cats eat for breakfast?

Mice Krispies!

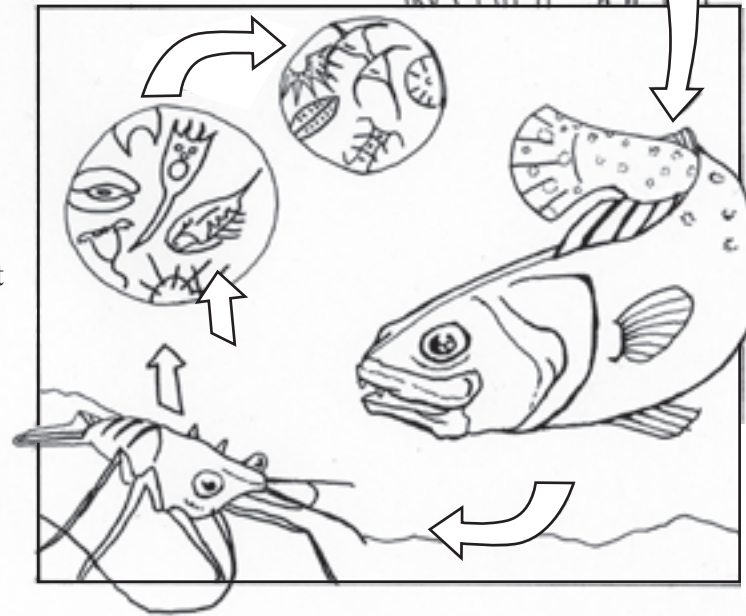
Why do seagulls live near the sea?

Because if they lived near the bay, they would be called bagels!

OCEAN FOOD CHAINS

The ocean is a resource that people all over the world share. The water in the Atlantic Ocean we see at the beach is part of same ocean kids in Mexico, Brazil, and even Africa can see. The animals and plants that live in the ocean depend on each other for food: these relationships are called food chains or more complicated food webs. A food chain or food web describes which plants or animals are the source of food for other creatures. People are also part of ocean food chains. Fishermen harvest tuna, flounder and grouper from the ocean, and these are sold in our supermarkets. Pollution of the ocean harms food chains near the source of the pollution but also in other countries that share the ocean. We must make sure that we protect the oceans and all natural resources because they not only belong to all of us, but they also belong to the plants and animals that depend on the ocean.



Number the plants and animals in order by what eats what. Then write whether it is a consumer or producer. Look at the example below for help.

Decomposer	<u>6</u>	Consumer (eats dead animals)
Killer whale	<u>5</u>	Consumer (no Predators)
Sea lion	<u>4</u>	Consumer
Herring	<u>3</u>	Secondary consumer
Zooplankton	<u>2</u>	Primary consumer (tiny aquatic animals)
Phytoplankton	<u>1</u>	Primary producer (plant that gets its energy from the sun)

Spotted sea-trout	_____	_____
Phytoplankton	_____	_____
Great blue heron	_____	_____
Zooplankton	_____	_____
Shrimp	_____	_____

The Gulf of Mexico is known as a "Dead Zone" because of the lack of oxygen in the water from all the pollutants. Pollutants come from over-fertilization of farms and flow into the Gulf from the Mississippi River.

Go to **Ranger Rick's Fun and Games** to play an exciting Food Chain Fish Food game.

<http://www.nwf.org/kids/>



A Food Department Case Study:

Coffee Production and Migratory Birds

Did you know that over 200 species of birds migrate from North America to Central and South America each year? What do you think happens to these migrants if the forest in their Central or South American home is destroyed? Each year thousands of acres of forest are destroyed for coffee production. *Read about how coffee can be grown in tropical rainforests and its effects on migratory birds. What can you do to help?*

Shade-grown Coffee!

ADVANTAGES

Good! Plantations that grow crops along with different types of trees and other plants can serve as great habitats for a variety of animals, especially migratory birds. Coffee can be grown in the shade of other trees, allowing for a variety of species to grow in the same area.

- Up to 150 birds may use the habitat of shade-grown coffee plantations.
- Migratory birds act as natural pesticides. They eat insects that often damage trees.
- Chemical fertilization is not needed with a variety of plants and nutrients in the soil.
- Migratory birds find food and shelter in shade-grown coffee plantations.
- Supports traditional farming methods. Shade-grown coffee trees can produce beans for up to 50 years.
- Some people say that shade-grown coffee tastes better.

www.learner.org/jnorth/tm/oriole/ShadeCoffee.html

Monoculture Grown Coffee

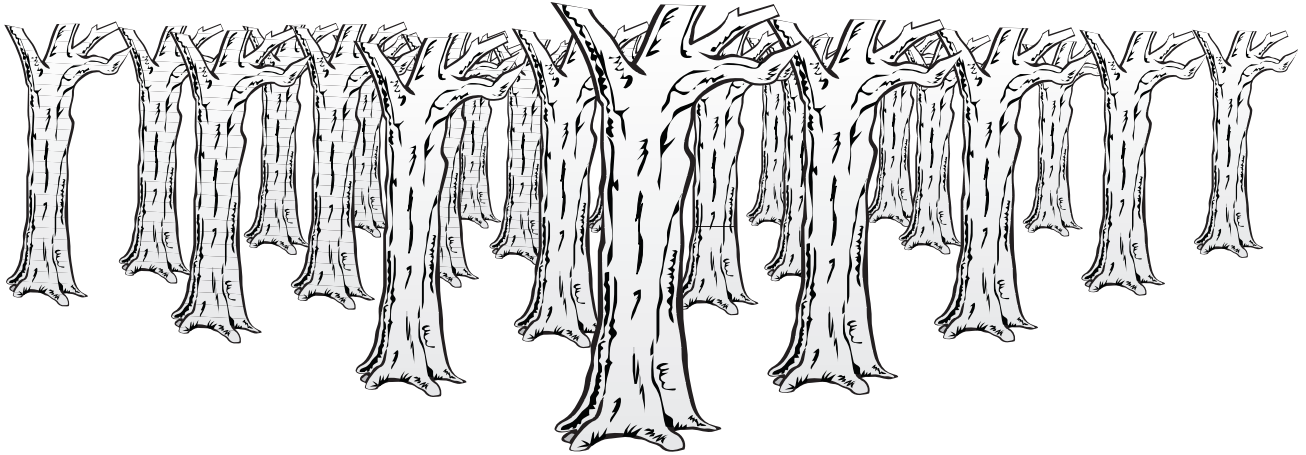
DISADVANTAGES

BAD! A monoculture is a farming technique in which only one type of plant or tree species is grown in an area. This technique is also called sun-grown farming. This type of farming is used in the southeastern United States where pine tree plantations are planted and all other trees and plants are removed. This also happens in Central and South America where farmers grow coffee in large monoculture plantations.

- Over 90% fewer birds are found in monoculture coffee plantations than in shade-grown coffee plantations.
- Large areas of rainforest are being cut down to plant sun-grown coffee.
- Causes loss of habitat for migratory birds, as well as iguanas, howler monkeys, and other animals.
- Erosion and lack of variety in plant species requires additional chemical fertilizers.
- Chemical pesticides are frequently applied to control insects that attack the trees.
- Pollutants from fertilizers and pesticides can get into the water supply and make the people who work on the plantations sick.
- Sun-grown coffee trees can produce beans for only 10-15 years.

Which forest would you rather live in?

Can you turn this sun-grown monoculture plantation into a shade-grown coffee plantation? Draw in a variety of tall canopy trees. You can also draw in the red berries of the coffee trees and birds enjoying their new habitat.



You are probably too young to drink coffee, but growing chocolate can also cause problems for migratory birds.

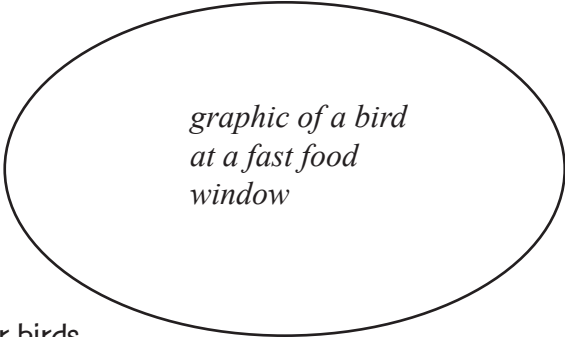
Cocoa trees also can be shade-grown, preventing thousands of acres of rainforest from being cut down and eliminating the need to use pesticides that pollute those areas. Shade-grown cocoa trees also provide good habitat for many migratory birds and other animals. Birds are beneficial to the cocoa plantations since they eat the insects that may damage the trees.

Color this picture of a farmer using the shade-grown farming technique for his cocoa plantation.

(The large football shaped pods hold the cocoa beans. They are a yellowish-orange color.)

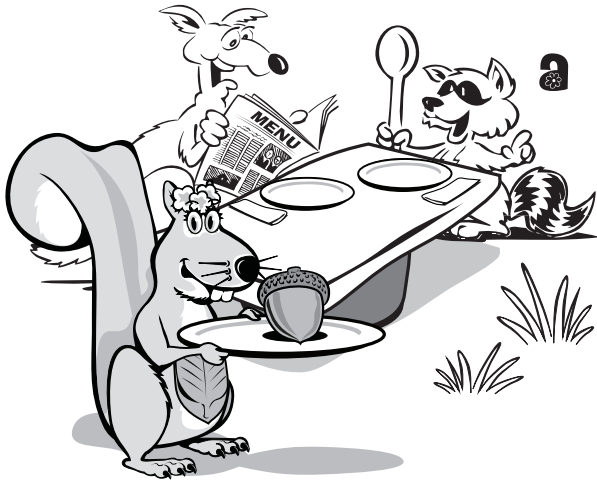
Migration Vacation

When birds migrate, it is much like when we go on vacation, except a lot more work! Birds need fuel to travel just like we need gasoline in our cars. Birds store up fatty tissue to give them some fuel along the way. They must make stops to refuel, finding food somewhere along their journey. There are no fast food restaurants for birds so they depend on shrubs, trees, and birdfeeders to help them complete their migration vacation.



*** Imagine you are a migratory bird that has flown to Mexico.** *Write a letter or draw a picture describing your wintering grounds. You can either find that your rainforest is gone, having been replaced by a monoculture coffee plantation or the rainforest may be growing shade-grown coffee with lots of food and habitat for you and your other bird friends.*

A large rectangular box for writing or drawing, with a small decorative icon in the top right corner. The icon is a square with a scalloped border, containing a stylized bird or figure.



a RESTAURANT IN YOUR BACKYARD

Did you know that there is a restaurant in your backyard?

Animals depend on plants and other animals for food. Examples of foods could be acorns, walnuts, pinecones, insects, or small mammals. Go outside and see how many different types of foods you can find. Write it down or draw a picture of it and then write/draw what type of animal might eat the different kinds of food you find.

Food	Animal

Threats to the Food Production Department Scramble

- Monoculture farming
- Pesticides
- Deforestation
- Overpopulation
- Pollution

Unscramble each of the clue words. Take the letters that appear in boxes and unscramble them to figure out who is affected by threats to the Food Production Department. One letter has been given to help you figure it out.

TEEORNIAFOSTD

TNLOIPUOL

LAEVOPNOTPURIO

LOCONEUMUT

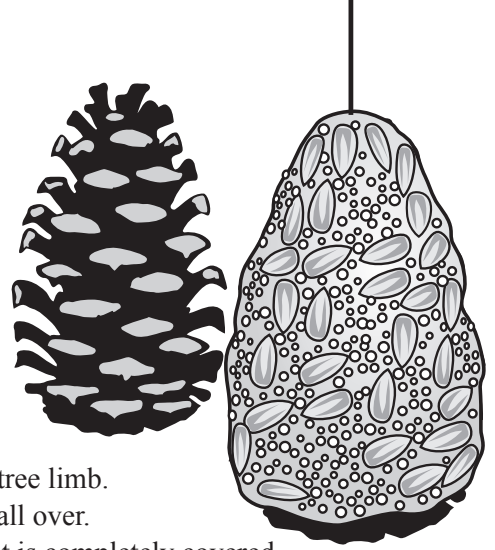
TOPISDEEC

Y

Pinecone Birdfeeder

Supplies:

- Pinecone (a larger one with the cone open is best)
- Peanut butter (can use lard or shortening in case of food allergies)
- Birdseed (black-hulled sunflower seed or a variety mix)
- String (long enough to wrap around the pinecone and hang from a tree)
- A knife or spatula (something to spread the peanut butter or lard)
- A plate or tray for the birdseed



Directions:

1. Tie the piece of string around your pinecone, leaving a long tail to tie to the tree limb.
2. Spread peanut butter (or lard) all over the pinecone, making sure to cover it all over.
3. Pour the birdseed on the plate or tray and roll the pinecone in the seed until it is completely covered.
4. Find a good tree in which to hang your birdfeeder. Make sure it is away from dangers such as cats or other predators.
5. Watch to see what kind of birds come to your feeder. You can make a study out of it by recording which types of birds visit the feeder and how often. Use the table below to record your data.

Bird Type <i>(write description or look it up in a field guide to identify what kind of bird it is)</i>	Number of visits



WHAT CAN YOU DO?

- Buy shade-grown coffee and chocolate, available at many natural food stores and some supermarkets. Or buy online at www.1000faces.org
- Put out bird feeders with a variety of types of birdseed.
- Plant native shrubs and trees for birds to nest in.
- Avoid using pesticides that can make birds sick from eating insects and plants that have been exposed to these chemicals..



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Garden Earth Naturalist Student Activity Packets

Project Partners: The State Botanical Garden of Georgia • Trees and Plants are Great! • Georgia 4-H The Georgia Museum of Natural History • The Partnership for Reform in Science and Math (PRISM) The Maquipucuna Foundation, Ecuador.

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Curricula Director – Anne Shenk

Curricula Writers – Heather Fleming, Anne Shenk

Editors – Anne Shenk, Carol Hoffman, Barbara Payne

Layout/Design/Illustration – William Reeves



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