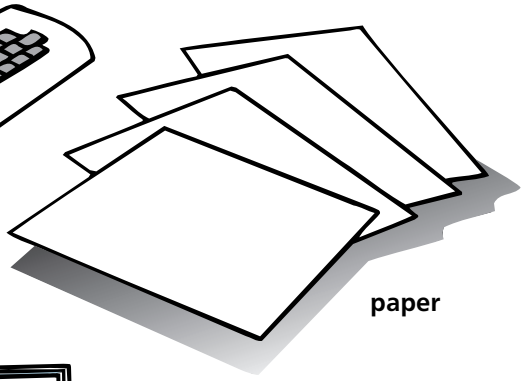
Chapter Science Investigation Name _____

Classifying Living Things

What You Need

Internet or library access



paper

15 classroom photos of plants and animals

assortment of published field guides of plants and animals

Find Out

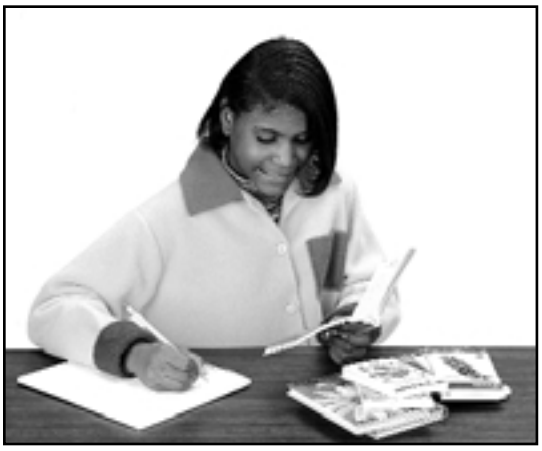
Do this activity to see how living things can be classified based on their physical characteristics.

Process Skills

Observing
Classifying
Communicating
Interpreting Data

Time

- 30 minutes the first day
- 10 minutes each day for three weeks



What to Do

1. The dichotomous key can be used to classify many common plants and animals. Choose two photos of plants and animals. Follow the dichotomous key to **identify** your selections.

2. **List** 20–30 animals and plants that you know about. Use these to create your own classification key based on the features the organisms have in common.

3. Use the Internet or the library to find out more information about 15 different animals and plants. **Write** the name of each new organism on the chart. Each day, **record** information about the organism. Use your key to **classify** it into one of the groups.

4. As you find out about new plants and animals, modify your key to reflect any characteristics that you did not originally include.

5. When you have finished, **compare** your classmates' keys with yours.

Dichotomous Key

a. Multicellular organism that photosynthesizes	Go to b
Organism that does not photosynthesize and does not have cell walls	Go to e
b. Plant with vascular tissue	Go to c
Plant without vascular tissue	Bryophyte
c. Plant without flowers	Go to d
Plant with flowers	Angiosperm
d. Seed producing	Gymnosperm
Spore producing	Fern
e. Animal with backbone	Go to f
Animal without backbone	Invertebrate
f. Warm-blooded vertebrate	Go to g
Cold-blooded vertebrate	Go to h
g. Warm-blooded with feathers	Bird
Warm-blooded with fur or hair	Mammal
h. Cold-blooded and lives on land	Reptile
Cold-blooded and lives in water	Go to i
i. Breathes through gills only	Fish
Breathes through gills and lungs	Amphibian

Classification of Organisms			
Day	**Organism's Name**	**Characteristics**	**Classification**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Conclusions

1. Among the plants and animals you studied, what characteristics were most important in helping you to classify them into common groups?
external features

2. How was your classification system similar to those of your classmates?
Answers will vary. They may have included more or fewer features.

New Questions

1. How would your key be useful to a visitor from another planet who wanted to find out the names of different living things on Earth?
Answers should reflect that the key will provide ways to identify some organisms based on general classification categories, but it will not provide the complete scientific classification for all organisms.

2. What would you need to include in your key to classify all organisms?
a way to identify monera, protista, fungi, and perhaps fossils

Name _____

ACTIVITY

Observing Fungi

Draw a picture of the mushroom you examine.
Student sketches should resemble mushroom observed.

Make a sketch of what the underside of the mushroom cap looks like through the hand lens.
Student sketches should resemble mushroom observed.

Make a sketch of what the hyphae look like under the microscope.
Student sketches should resemble mushroom observed.

Name _____

Conclusions

1. What did the underside of the cap of the mushroom look like?
Answers will vary: some may say flaps or gills or spores.

2. What did the mushroom hyphae look like under the microscope?
Answers will vary: some may say ribbons.

3. Were the cells of the hyphae similar?
Most students will note a similarity.

Asking New Questions

1. How do your sketches compare to the illustration on page A10?
Answers will vary.

2. How are different mushrooms similar?
Possible answers include reproduce by spores, have hyphae, and hyphae form mycelia.

3. What other questions about fungi do you have?
Accept all reasonable responses.

Name _____

ACTIVITY

Observing Plant Parts

List the names of the flowering plants, their colors, and the number of petals each flower has. For the flower you choose, also **list** the number of stamens and the number of pistils.

Flowering Plant Name	Color	How Many Petals?	How Many Stamens?	How Many Pistils?
Lily	as assigned	multiple of 3	6	1
Gladiolus	as assigned	multiple of 3	3	1
Geranium	as assigned	multiple of 4 or 5	10	1

Make a sketch of the way the pollen grains from your group's flowers look.
Student sketches should reflect round shape.

Make a sketch of the way the ovules from your group's flowers look.
Sketches will vary depending on flowering plant.

Name _____

Conclusions

1. Were the pollen grains from all of the flowers in your group the same under the microscope? Describe the similarities and differences.
The pollen grains all have a spherical shape, but they are different in size, color, and appearance.

2. Were the ovules from the pistils from all of the flowers in your group the same under the microscope? Describe the similarities and differences.
The ovules are all egg-shaped, but they are different in size and color.

3. **Record** whether the flowers in your group contained both stamens and pistils.
Each flower has both stamens and a pistil.

Asking New Questions

1. With your group, **discuss** ways that pollen from the stamens can be transferred to the pistil.
Answers may include wind, humans, animals, water, and gravity.

2. Can you find conditions under which the pollen grains will germinate outside the flower?
Answers will vary. Students may suggest the pollen and pistils could be artificially germinated in a laboratory.

Name _____

ACTIVITY

Comparing Bones

Sketch and **label** the bird bone and the mammal bone cross sections.

How are the bones alike?

How are the bones different?

Students may note that the bird bone is hollow, the mammal bone is not; that the bird bone is lighter than the mammal bone; that the bird bone is more delicate than the mammal bone

Which bone do you think is stronger?

Students may think that the mammal bone is stronger because the bird bone is hollow.

Which bone is more dense?

the mammal bone

Sketch and **label** the bird bone and the mammal bone (whole bones).

How are the bones alike?

Same general material makes up both bones.

Same general form.

How are the bones different?

Mammal bone is larger.

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Conclusions

1. What similarities between the two types of bones did you **observe?**
same general form, same general material

2. Which type of bone is more dense?
mammal

3. What other differences between the two types of bones did you **observe?**
mammal bone was solid and had fatty marrow; bird bone was hollow

Asking New Questions

1. What advantage do solid bones have?
provide more support for animals' mass and stress of muscles in running

2. What advantage do hollow bones have?
light for flying