

Laboratory Investigation

Classification of Living Things

2**Identifying Vertebrates Using
Classification Keys****Background Information**

Organisms such as vertebrates (animals with backbones) are classified into groups according to certain characteristics. Using these characteristics, classification keys can be developed. Biologists and science students can use these classification keys to identify unfamiliar organisms. Such keys are also useful in studying common characteristics and relationships among organisms.

In this investigation you will learn to use a simple classification key to identify some organisms.

Problem

How is a classification key used to identify various animals?

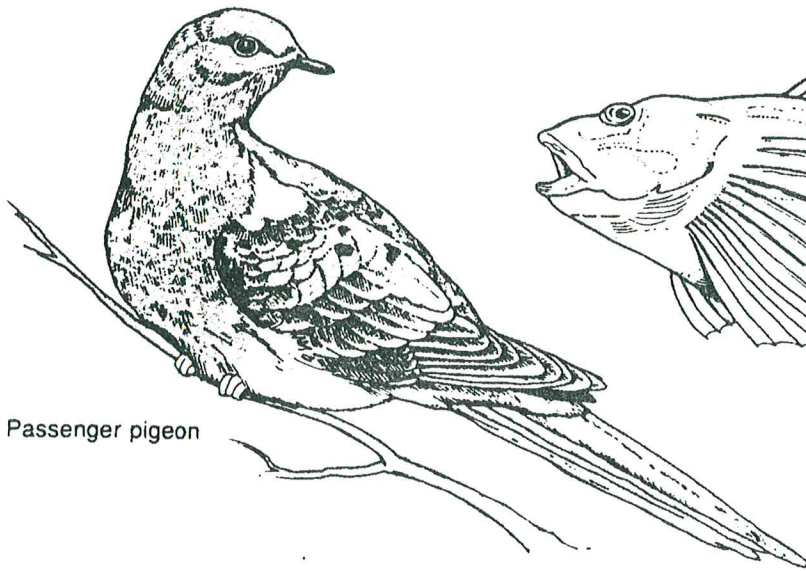
Materials (*per group*)

pencil

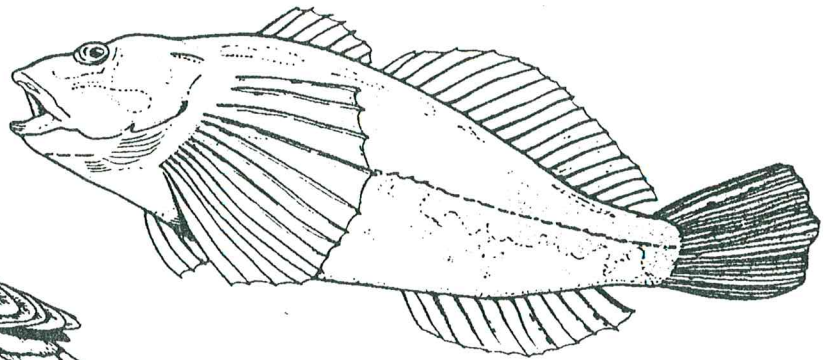
Procedure

1. Vertebrates can be divided into five major groups: fishes, amphibians, reptiles, birds, and mammals. (Note that these are not all taxonomic groups. Vertebrates are formally divided into eight classes, four of which are fishes.) Fishes, amphibians, and reptiles are ectothermic because their body temperatures change with their environment. (*Ecto-* means outside; *-therm* means heat.) Birds and mammals are endothermic because their body temperatures remain fairly constant. (*Endo-* means inside.) Some animals in each of these vertebrate groups have become extinct, or completely died out, primarily because of the activities of humans. Ten such extinct animals are pictured in Figure 1. Study these animals and identify their characteristics by completing the Data Table.

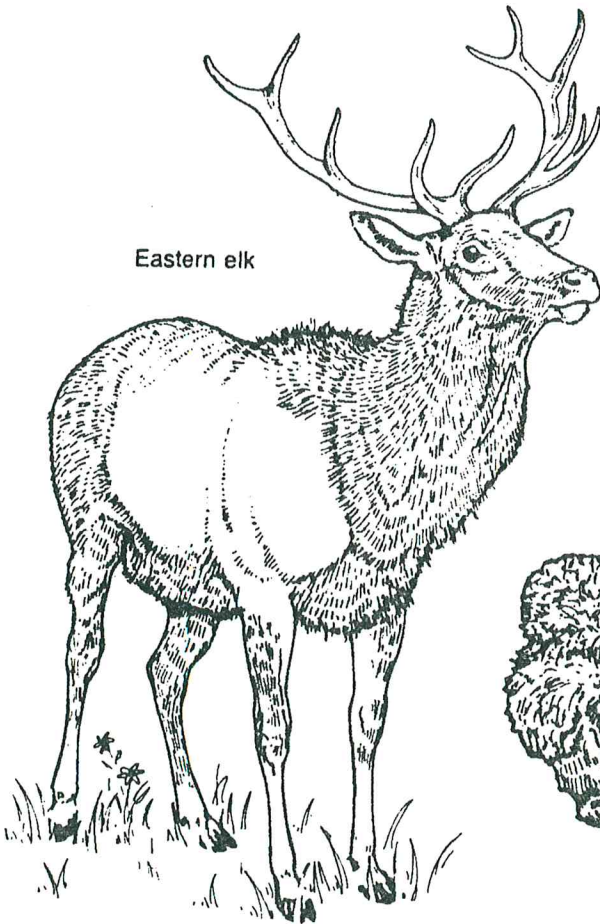
Figure 1



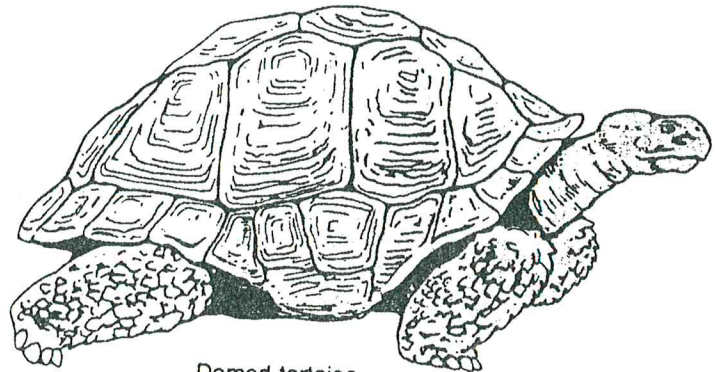
Passenger pigeon



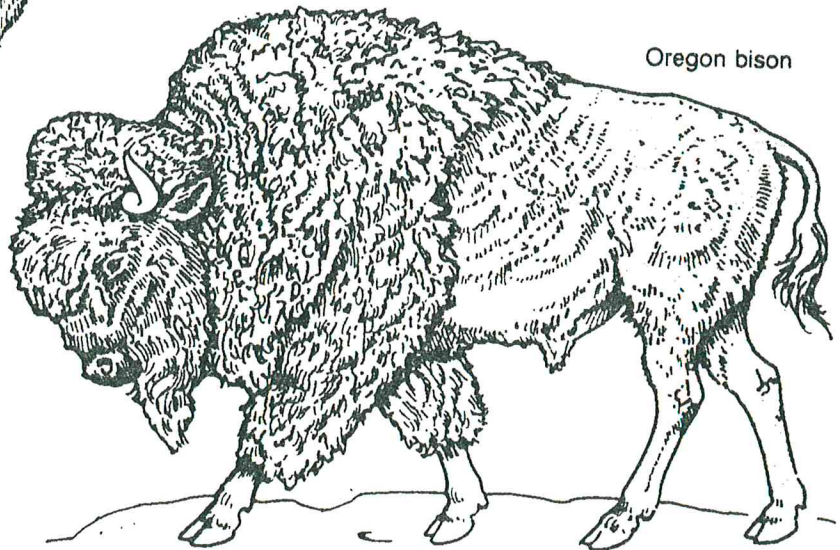
Utah Lake sculpin



Eastern elk

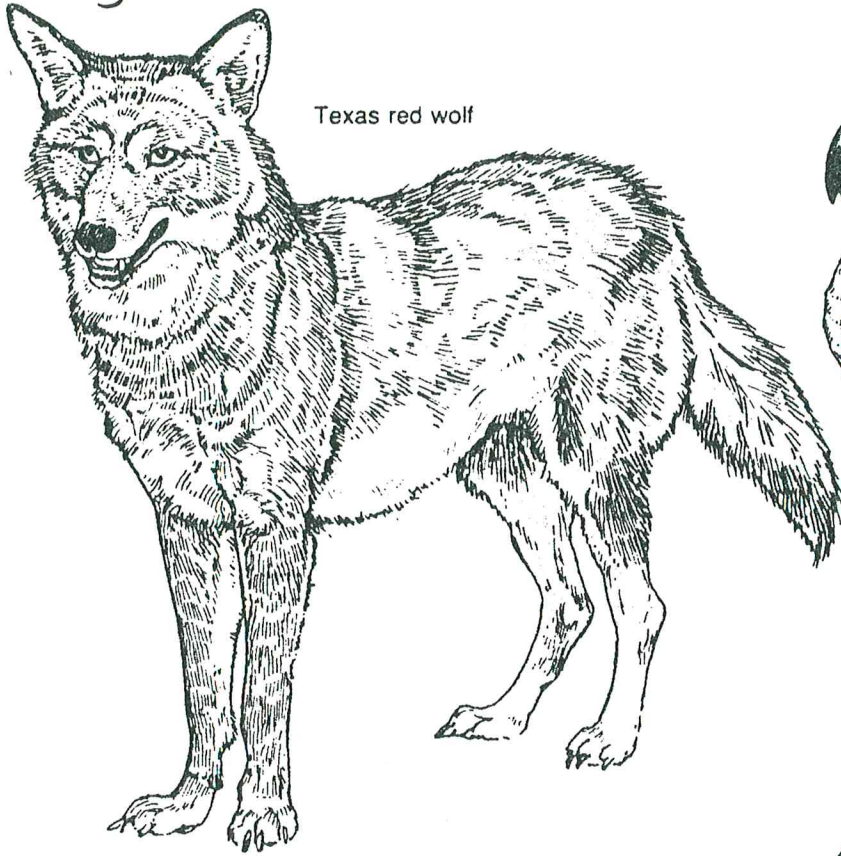


Domed tortoise

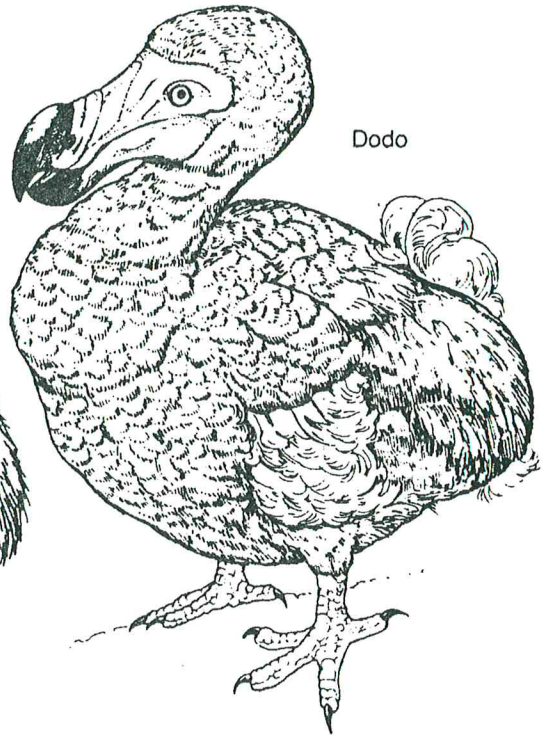


Oregon bison

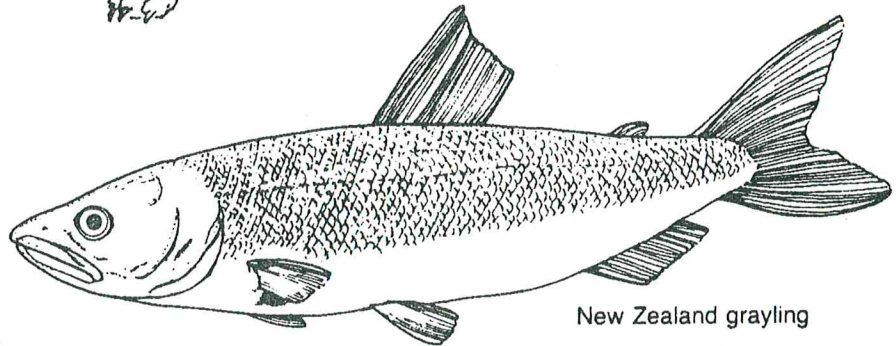
Figure 1



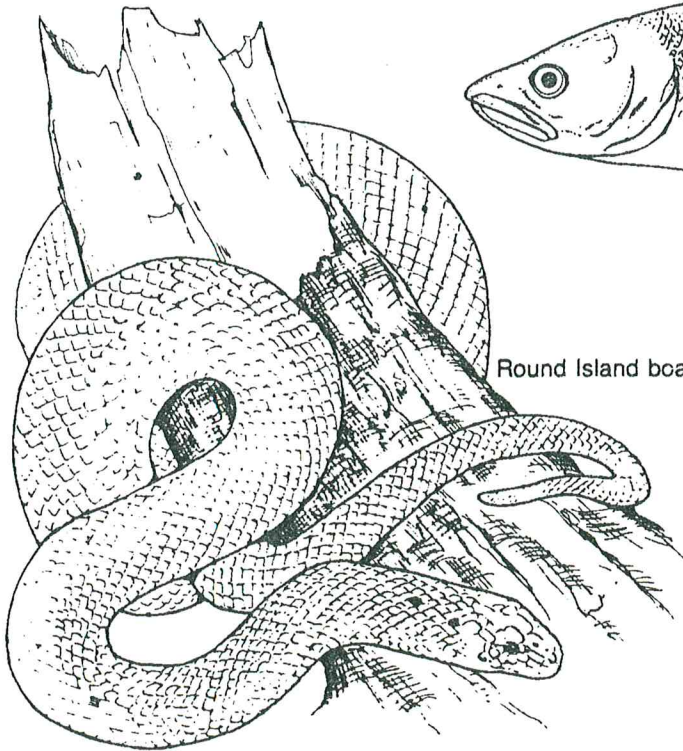
Texas red wolf



Dodo



New Zealand grayling



Round Island boa



Palestinian painted frog

2. Using the information from the pictures and the Data Table, the accompanying classification key was developed. See if you can classify each animal by placing it in its correct position in this key.

Observations

DATA TABLE

Name of Animal	Appendages					Body Covering				Temperature Regulation		Breathing Mechanism	
	Fins	Wings	Forelegs	Hindlegs	Horns	Smooth skin	Scales	Feathers	Hair	Ectothermic	Endothermic	Gills	Lungs
Domed tortoise													
Dodo													
Utah Lake sculpin													
Texas red wolf													
Passenger pigeon													
Eastern elk													
Round Island boa													
Palestinian painted frog													
Oregon bison													
New Zealand grayling													

CLASSIFICATION KEY FOR THE EXTINCT ANIMALS SHOWN IN FIGURE 1

1a Is endothermic	Go to 2
1b Is ectothermic	Go to 6
2a Has feathers	Go to 3
2b Has hair or fur	Go to 4
3a Has narrow, straight beak	_____
3b Has wide, crooked beak	_____
4a Has horns	Go to 5
4b Has no horns	_____

5a Horns have many branches	_____
5b Horns have no branches	_____
6a Breathes with gills.....	Go to 7
6b Breathes with lungs	Go to 8
7a Has large, fan-shaped fins just behind the head.....	_____
7b Has small pectoral fins.....	_____
8a Has scaly skin	Go to 9
8b Has smooth skin.....	_____
9a Has front and hind legs	_____
9b Has no legs.....	_____

Analysis and Conclusions

1. Reptiles are ectothermic, have scaly skin, and breathe with lungs. Which of the animals are reptiles?

2. The Palestinian painted frog is an amphibian. How are amphibians different from reptiles?

3. Mammals are endothermic, have hair or fur, breathe with lungs, and give birth to live young. Which of the animals are mammals?

4. Birds and mammals are endothermic vertebrates. Which animals in Figure 1 are birds?

5. Which of the following pairs of vertebrate groups are most like each another (share the most characteristics)? Circle your choice.

- | | |
|----------------------|-------------------------|
| birds and fishes | amphibians and reptiles |
| reptiles and mammals | fishes and mammals |