

Dichotomous Keys

Problem

Can you construct a dichotomous key that could be used to identify organisms?

Introduction

In May 2007, scientists and other volunteers gathered in Rock Creek Park, Washington, D.C., to participate in a BioBlitz—a quick, 24-hour survey of species living in the park. Teams worked in 4-hour shifts throughout the park. By the time they were done, the teams had identified more than 650 species!

Teams included experts on different types of organisms such as birds, beetles, fungi, and plants. The experts used identification guides, or keys, to help them identify the organisms they found.

In this lab, you will first use a dichotomous key to identify sharks. A dichotomous key is built around pairs of statements that describe a visible trait. The reader must select the statement in each pair that best describes a specimen. By following the steps in the key, the reader narrows down the list of choices and finally names the specimen. After you have learned to use a dichotomous key, you will design your own key for a group of organisms.

Skills Focus

Observe, Classify, Compare and Contrast, Sequence

Pre-Lab Questions

1. **Observe** Name **three** different physical traits that are used in the shark dichotomous key.

2. **Classify** Do all the sharks you will try to identify belong to the same genus? Explain your answer.

3. **Use Dichotomous Key to classify the sharks.**

Data Table		
Shark	Scientific Name	Common Name
A		
B		
C		
D		
E		
F		

Name _____ Class _____ Date _____

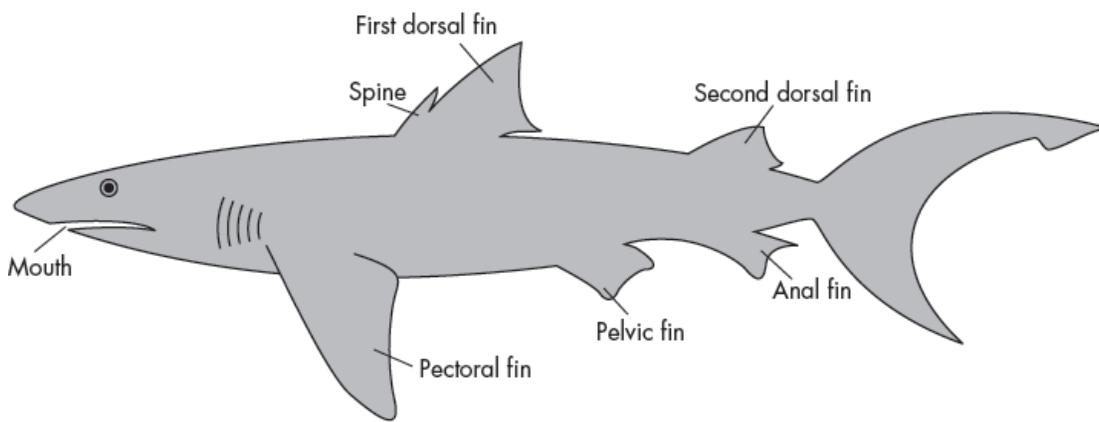
Name _____ Class _____ Date _____

Procedure

Part A: Use a Dichotomous Key

1. Before you try to identify sharks, you need to understand a bit about shark anatomy. Figure 1 is a general shark drawing with labels showing the possible locations of fins. Refer to Figure 1 as you use the dichotomous key to identify the sharks in Figure 2.
2. Choose one shark from Figure 2. Begin by reading statements 1a and 1b in the key. One of the statements describes the shark; the other does not. Choose the statement that describes the shark and follow the directions for that statement.
3. Continue following the steps in the key until you have identified the shark. Record the scientific and common name of the shark in the data table.
4. Repeat Steps 2 and 3 for the other sharks in Figure 2.

Figure 1 General external anatomy of shark



Dichotomous Key for Sharks		
Step	Characteristic	Species
1a	Anal fin present . . . <i>Go to Step 2</i>	
1b	No anal fin . . . <i>Go to Step 6</i>	
2a	One dorsal fin	<i>Notorynchus cepedianus</i> , Sevengill shark
2b	Two dorsal fins . . . <i>Go to Step 3</i>	
3a	Spines on dorsal fins	<i>Heterodontus francisci</i> , Horn shark
3b	No spines on dorsal fins . . . <i>Go to Step 4</i>	
4a	Mouth at front of head	<i>Rhincodon typus</i> , Whale shark
4b	Mouth at bottom of head . . . <i>Go to Step 5</i>	
5a	Eyes on ends of hammerlike projection	<i>Sphyrna zygaena</i> , Smooth hammerhead
5b	No hammerlike head	<i>Carcharodon carcharias</i> , Great white shark
6a	Flattened body (like ray)	<i>Squatina squatina</i> , Angel shark
6b	Body not flattened . . . <i>Go to Step 7</i>	
7a	Long sawlike projection from snout	<i>Pristiophorus schroederi</i> , Bahamas sawshark
7b	No sawlike projection	<i>Somniosus microcephalus</i> , Greenland shark

Analyze and Conclude Post Lab Questions

Answer the following questions using complete sentences.

1. **Predict** How would the dichotomous key for sharks need to change if you wanted to use it to identify ten different sharks?

2. **Infer** Suppose you had real specimens of your organisms instead of drawings. What other traits could you use to build a dichotomous key?

3. Why is it important for the scientific name to be in Latin? _____

4. How do you write a scientific name? _____

5. List the order of taxa from the most general to the most specific.

6. Other than physical traits, what other characteristics can we use to classify an organism?

7. Arthropods are joint-legged animals. Spiders, crabs, pill bugs, centipedes, and millipedes are examples of the many types of arthropods. Which of these arthropods are most closely related?

- A. Arthropods of the same family
- B. Arthropods of the same class
- C. Arthropods of the same genus
- D. Arthropods of the same species

8. Use the dichotomous key below to classify the animal.



Dichotomous Key

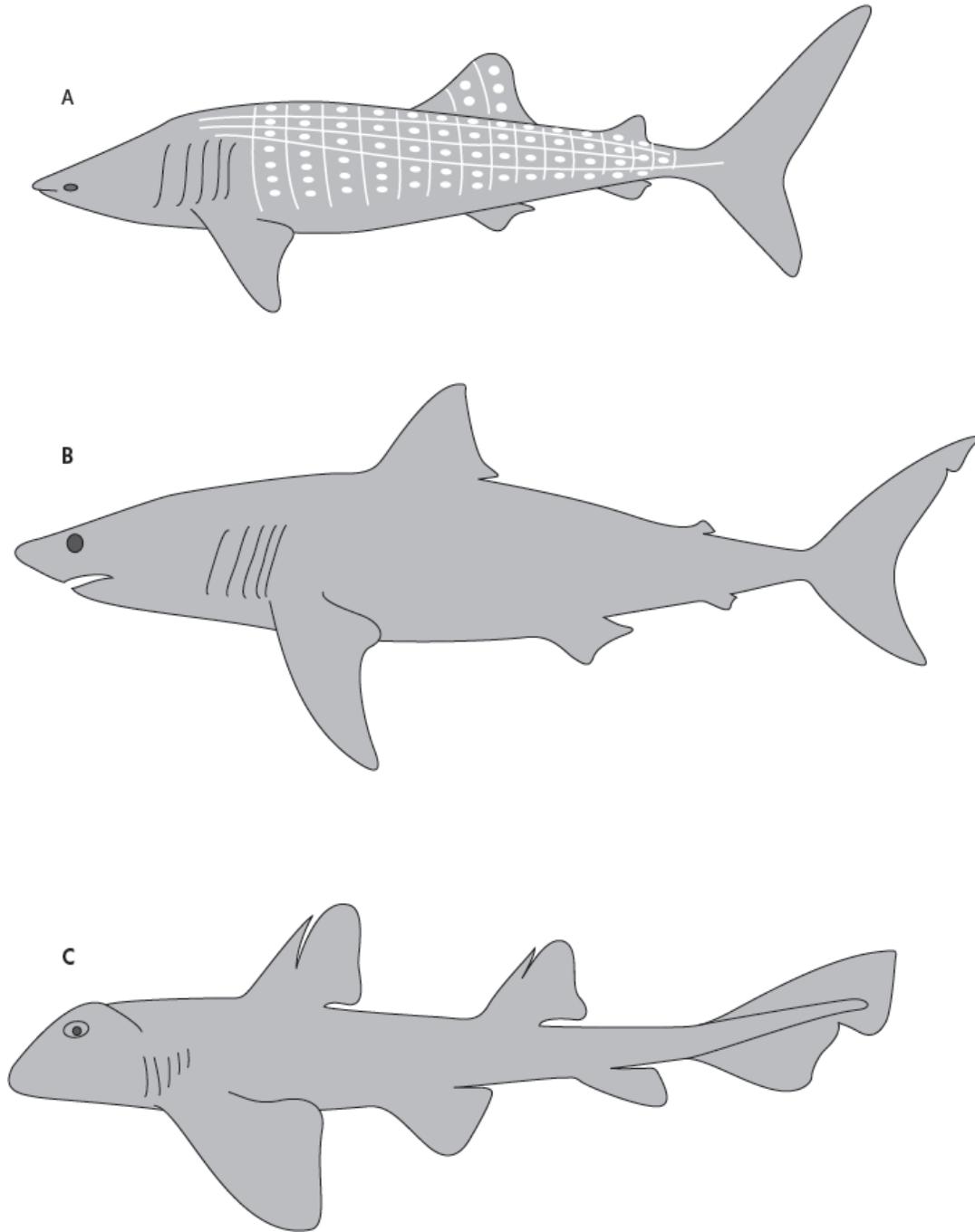
Step	Characteristic	Identification
1a	Possesses segmentation	Go to 2
1b	Lacks segmentation	Go to 3
2a	Has an exoskeleton with jointed appendages	Phylum Arthropoda
2b	Has no exoskeleton, unjointed appendages (if any present), and a segmented worm-like body; is possibly in a tube (if in a tube, may have tentacles)	Phylum Annelida
3a	Possesses a foot, a radula, arms, and/or a shell	Phylum Mollusca
3b	Lacks all of the above and is dorsoventrally flattened	Phylum Platyhelminthes

- A. Arthropoda
- B. Annelida

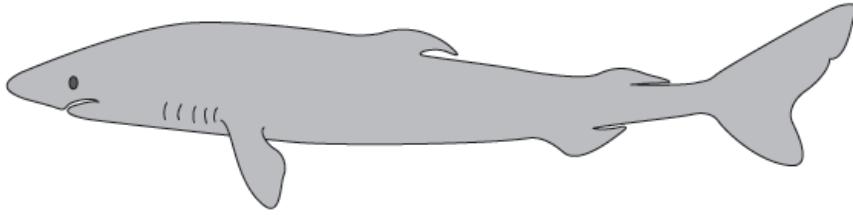
- C. Mollusca
- D. Platyhelminthes

Name _____ Class _____ Date _____

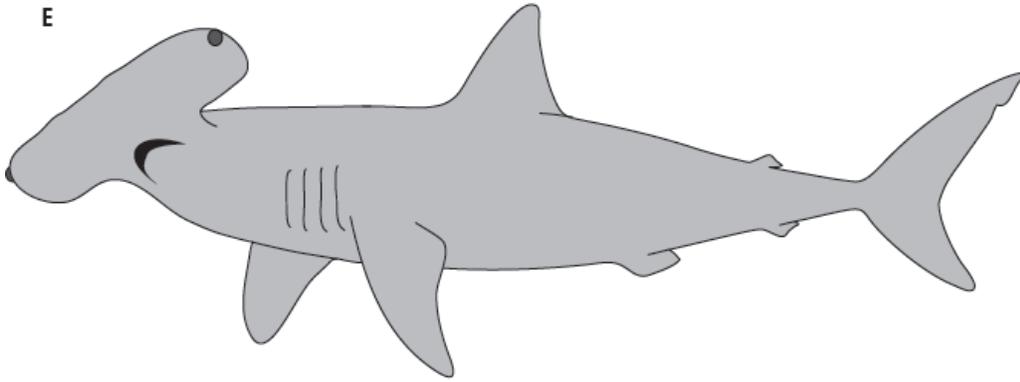
Figure 2 Shark species



D



E



F

