Shark Dichotomous Key

Standards:
GLE 0507.5.1 Investigate physical characteristics associated with different groups of animals
GLE 0807.5.1 Identify various criteria used to classify organisms into groups.
GLE 0807.5.2 Use a simple classification key to identify a specific organism.

Supplies:
• 12 Laminated Shark Tooth Charts
• Binder with lesson and student worksheet copies
• 6 bags of shark teeth.

This activity is about learning to use a dichotomous key to sort biological items of a certain category. The first half of the activity is a worksheet called “Name That Fish”. The students will get the page with the key and the fish pictures. The first page is instructions for the teacher or fellow to use. The second half of the activity is creating a dichotomous key based on the Common Vertebrate Fossils chart and then sort their real shark teeth using that key.

Students should use the laminated chart with Common Vertebrate Fossils on one side and shark and tooth name parts to create a shark tooth dichotomous key. Once they have created a key they should then sort their bags of shark teeth. This activity can be a group or solo activity depending on your class needs.

Please try to handle the fossils with care and make sure the students don’t take what they are not supposed to take.
Name That Fish

OBJECTIVE
The student will be able to use a dichotomous key to identify shark and batoid families.

MATERIALS
- copies of Name That Fish funsheet on page 10
- copies of Key to Families on page 11
- pens or pencils

BACKGROUND
All sharks and batoids belong to a group of fishes called the Chondrichthyes. To help learn about them, scientists divide them into groups called families. All the sharks in one family usually will look more like each other than sharks in other families.

To find out which family a shark is in, you would examine the shark carefully. You would count the gill slits on the sides of the shark’s head. You would look at the shark’s paired pectoral fins and paired pelvic fins, its one or two dorsal fins, and its anal fin (if it has one—not all sharks do). And you would look at the shark’s tail, called a caudal fin.

A useful tool for listing characteristics and identifying a shark’s family is a dichotomous key. The key presents a sequence of questions. Each question offers two choices.

ACTION
1. Distribute copies of the Name That Fish funsheet and Key to Families to the students. For this activity, students may work individually or in learning groups.

2. Instruct students to always begin at number one of the Key to Families for each shark on the Name That Fish funsheet.

   Students read sentences 1A and 1B of the key. They study Shark 1 for the characteristics referred to in 1A and 1B. For each shark, they choose either 1A or 1B, and then follow the directions given in that letter. When they can identify the shark family, they write the family name on the line below each animal. Lead them through one or two examples.

   **ANSWERS**
   1. Rajidae
   2. Scylliornithidae
   3. Lamnidae
   4. Squalidae
   5. Heterodontidae
   6. Hexanchidae
   7. Aplodidae
   8. Pristiophoridae
   9. Carcharinidae
   10. Rhincodontidae
   11. Dasyatidae
   12. Pseudotriakidae
   13. Sphyrnidae
   14. Mobulidae

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Shark Dichotomous Keys

Dichotomous key
/daɪˈkɒtəməs/

1. a key used to identify a plant or animal in which each stage presents descriptions of two distinguishing characters, with a direction to another stage in the key, until the species is identified.

In a dichotomous key each step has two questions hence, the di- prefix. Based on the answer to the question, the user then moves on to a different number in the key and selects which question answers the attributes of the specimen in question and moves on until the key yields the correct classification.

This activity will have a dichotomous key activity in which you will find various species in the shark family. Use the key to identify all of the fish on the page. If you are unfamiliar with the terms there is a labeled shark on the laminated sheet. After you have completed that worksheet it is your turn to design your own dichotomous key for the shark’s teeth pictured on the chart. Use the technical name for the shark tooth parts in your key. Once the key is created based on Common Vertebrate Fossils sort your bag of shark teeth according to your key.
Key to Families

1. A. body kitelike if viewed from the top ........................... go to 12  
   B. body not kitelike if viewed from the top ........................... go to 2

2. A. anal fin absent ........................................ go to 11  
   B. anal fin present .......................................... go to 3

3. A. six gill slits present ................................. Family Hexanchidae  
   B. five gill slits present ........................................ go to 4

4. A. dorsal fin with spines ...................................... Family Heterodontidae  
   B. no spines on dorsal fins ..................................... go to 5

5. A. mouth at front of snout (rather than  
    on underside of head) .................................... Family Rhincodontidae  
   B. mouth on underside of head ............................... go to 6

6. A. head expanded with eyes at ends of expansion .... Family Sphyrnidae  
   B. head not expanded ........................................ go to 7

7. A. top half of caudal fin about the  
    same size as bottom half ................................ Family Lamnidae  
   B. top half of caudal fin different  
    in size than bottom half .................................... go to 8

8. A. first dorsal fin very long, almost  
    half the total length of the body .................... Family Pseudotriakidae  
   B. first dorsal fin regular length ........................ go to 9

9. A. caudal fin very long, almost as long as entire body .. Family Alopidae  
    B. caudal fin “regular” length ................................ go to 10

10. A. base of first dorsal fin behind pelvic fins ....... Family Scyliorhinidae  
    B. base of first dorsal fin in front of pelvic fins ... Family Carcharhinidae

11. A. long point on the end of snout ...................... Family Pristiophoridae  
    B. snout without long point ................................ Family Squalidae

12. A. front of animal has two hornlike appendages .... Family Mobulidae  
    B. no hornlike appendages .................................... go to 13

13. A. small dorsal fin present near tip of tail .......... Family Rajidae  
    B. no dorsal fin present near tip of tail ............... Family Dasyatidae
Name That Fish

Use "Key to Families" to help you identify the family of each shark or batoid on this page.

1. __________
2. __________
3. __________
4. __________
5. __________
6. __________
7. __________
8. __________
9. __________
10. __________
11. __________
12. __________
13. __________
14. __________
Name: ____________________________________________  Class: ________

1a. __________________________________________________  
1b. __________________________________________________  

2a. __________________________________________________  
2b. __________________________________________________  

3a. __________________________________________________  
3b. __________________________________________________  

4a. __________________________________________________  
4b. __________________________________________________  

5a. __________________________________________________  
5b. __________________________________________________  

6a. __________________________________________________  
6b. __________________________________________________  

7a. __________________________________________________  
7b. __________________________________________________  

8a. __________________________________________________  
8b. __________________________________________________  

9a. __________________________________________________  
9b. __________________________________________________  

10a. _________________________________________________  
10b. _________________________________________________
Name: ____________________________________________  Class: _________

11a. ______________________________________________________

11b. ______________________________________________________

12a. ______________________________________________________

12b. ______________________________________________________

13a. ______________________________________________________

13b. ______________________________________________________

14a. ______________________________________________________

14b. ______________________________________________________

15a. ______________________________________________________

15b. ______________________________________________________

16a. ______________________________________________________

16b. ______________________________________________________

17a. ______________________________________________________

17b. ______________________________________________________

18a. ______________________________________________________

18b. ______________________________________________________

19a. ______________________________________________________

19b. ______________________________________________________

20a. ______________________________________________________

20b. ______________________________________________________

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Figure 6. The external parts of a shark

**COMMON VERTEBRATE FOSSILS FROM THE MIocene OF MARYLAND AND VIRGINIA**

- *Carcharodon megalodon*  
  Extinct Megalodon
- *Carcharodon subauriculatus*  
  Extinct Megalodon Shark
- *Isurus sp.*  
  Mako Shark
- *Galeocerdo aduncus*  
  Extinct Tiger Shark
- *Galeocerdo contortus*  
  Extinct Tiger Shark
- *Squatina subserrata*  
  Angel Shark
- *Alopias latidens*  
  Thresher Shark
- *Carcharias sp.*  
  Sand Tiger Shark
- *Carcharhinus sp.*  
  Requiem Shark
- *Sphyra sp.*  
  Hammerhead Shark
- *Negaprion sp.*  
  Lemon Shark
- Porpoise teeth
- Ray teeth/pavements

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