

# Classification 2: Vertebrate Grab Bag

## Middle School Scientists Curriculum

### **Class Time Required:**

1 class period (50-65 minutes)

Extension (30-45 minutes)

### **Materials Needed:**

- Engagement: Video
- Investigation and Explanation: Worksheet 1, "Classification 2: Vertebrate Grab Bag", Attachment 1, "Classification 2: Vertebrate Grab Bag" (Grab Bag Envelope --1 envelope per 2 students), Resource Materials (books, textbooks, internet)
- Extension: Paper, Colored Pencils

**Teacher Preparation:** 30-60 minutes to review activity, collect materials, and make copies

**Student Knowledge:** basic knowledge of vertebrate groups (fish, amphibian, reptile, bird, mammal)

**Vocabulary:** vertebrate, invertebrate, ectothermic, endothermic, characteristic, diaphragm

### **Next Generation Science Standards:**

#### • **MS-LS4-2.**

Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.

#### • **MS-LS4-1, MS-LS4-2 Crosscutting Concepts**

Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.

### **Overview:**

Vertebrate Grab Bag is an activity that gives students a basic understanding of the different vertebrate classes (fish, amphibian, reptile, bird, and mammal). For most students this will be a review of previously learned content, but will also help clarify and reinforce the differences between the different vertebrate classes, especially between amphibians and reptiles. Students will use clues to determine "What makes a mammal a mammal?" "What makes a fish a fish?" etc. By identifying characteristics of each animal group, students will make connections about what the groups have in common and what distinguishes them from each other.

## Background Information:

This activity centers on the five major vertebrate classes: fish, amphibian, reptile, bird, and mammal. These classes have things in common, but also have features that separate them into the different groups. This activity encourages students to think of the similarities and differences between the groups, as well as considering how these characteristics contribute to the animals' survival within a particular environment. ("What are the 5 Main Vertebrate Groups," 2014)

List of characteristics used in this activity for each class of vertebrates:

Fish: backbone, ectothermic, scales, gills, fins, jelly-like eggs

Amphibians: backbone, ectothermic, moist thin skin, lungs, no claws, jelly-like eggs

Reptiles: backbone, ectothermic, dry scaly skin, clawed toes, leathery eggs, lungs

Birds: backbone, endothermic, feathers, hollow bones, hard-shelled eggs, lungs

Mammals: backbone, endothermic, hair / fur, diaphragm, lungs, produces milk

## Focus Questions:

What are characteristics that all vertebrates have in common?

What characteristics are used to separate the different vertebrate groups?

How do the different groups' characteristics help them survive in their environment?



## Learning Target:

I can describe the main characteristics of the different vertebrate groups and how they help with the animals' survival.

## Engagement:

(10-15 minutes)

The instructor will show a short video focusing on any group of vertebrates or all of them as a whole. The instructor will engage the students in questioning about basic vertebrate characteristics for each of the groups, taking time to go over any unknown vocabulary. Following are website suggestions:

- Refseek\* website lists many websites that have free educational videos: [http://www.refseek.com/directory/educational\\_videos.html](http://www.refseek.com/directory/educational_videos.html)
- You Tube: [www.youtube.com](http://www.youtube.com)
- Discovery Education: <http://www.discoveryeducation.com>
- NeoK12: <http://www.neok12.com>

## Investigation:

(25-30 minutes)

1. Students will work in pairs. The instructor will provide each pair with Worksheet 1, "Classification 2: Vertebrate Grab Bag" and an envelope containing clues on separate slips of paper about the five classes of vertebrates (Attachment 1, "Classification 2: Vertebrate Grab Bag"). Students will use these clues to complete their worksheets. Each clue may be used only once unless specifically stated otherwise. For example, the clue "Backbone" indicates that it will be used five times and, therefore, is a clue that will be placed under each of the five classes. For each vertebrate class there will be a clue

that states the class name, examples of animals in this class, and six other characteristics of that class.

2. To help students keep track of the clues, direct them to take all the clues out of the envelope. As they determine in which group a clue belongs, students should copy the clue onto their worksheets and then return it to the envelope. Clues for which a student is unsure can be put in a separate pile to consider after the easier clues are placed. Organizational tip: print each set of clues on a different color of paper to help organize if the clues get mixed up

**Explanation:**

(15-20 minutes)

After completion of worksheet, the instructor will direct students to pair up with a new partner. Students should compare their answers and check for accuracy. They will then pick one vertebrate group and discuss how the characteristics of their selected group helps the animals survive in their environments. After groups have had a chance to process their information, they will present their thoughts and ideas to the class.

**Extension:**

(30-45 minutes)

Students will write and illustrate a science poem: Poetry is a great way to express an understanding of any concept. Poetry allows students to summarize, expand, and make creative connections using personal background knowledge. Students will pick one vertebrate group, or individual species from within a vertebrate group, to write a science poem and then illustrate with a picture. Instructors may use any set of guidelines for the poem. Following are examples of two types of science poems (Mitchell, 2014):

**Acrostic:** Students will write the letters of the name of their chosen animal/vertebrate group down the page. For each letter, students will come up with a meaningful term that describes the animal/vertebrate group.

A—awesome animals  
M—metamorphose  
P—predator and prey  
H—habitat is disappearing  
I—in moist places  
B—breathe through their skin  
I—inhabit many habitats  
A—activity limited by temperature  
N—newts and salamanders

**Diamante:** This type of poetry is created using seven lines. Each line has different requirements, as listed below. The completed poem should have a diamond-shape.

First Line – one noun  
Second—two adjectives

Third—three verbs ending in –ing  
Fourth—four nouns  
Fifth—three verbs ending in –ing  
Sixth—two adjectives  
Seventh—one noun

Mammal  
Loyal, Smart  
Sniffing, Eating, Barking  
Friend, Treats, Toys, Protector  
Pooping, Playing, Drinking  
Fun-loving, Furry  
Dog

**References:**

"Clipart - High Quality, Easy to Use, Free Support." *Clipart - High Quality, Easy to Use, Free Support*. N.p., n.d. Web. 23 June 2014. <<http://openclipart.org>>

Mitchell, Kathi. "Different Types of Poems for Kids." *Different Types of Poems for Kids*. N.p., 26 Mar. 2014. Web. 23 June 2014.  
<<http://www.kathimitchell.com/poemtypes.html>>

"What Are the 5 Main Vertebrate Groups?" *HubPages*. HubPages, 2014. Web. 26 June 2014. <<http://hubpages.com/hub/what-are-the-vertebrate-groups>>