

**LESSON: Creating a Dichotomous Key      GRADE:      1****OBJECTIVES:****From Molecules to Organisms: Structures & Processes-**

- **LS1.A: Structure and Function**

All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

- **LS1.B: Growth and Development of Organisms**

Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)

- **LS1.D: Information Processing**

Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

**MATERIALS & RESOURCES:**

- Items to be divided: plant parts or pictures of animals, animal behaviors
- Chalk or whiteboard
- Chalk or marker
- Illustrations- example of a dichotomous key & blank dichotomous key

**PRESENTATION:**

Talk to students about ways of classifying animals or plants. Today the method they will learn about is called a dichotomous key.

**DIRECTIONS:**

1. Assemble the class in an area where they can all stand in a large group.
2. Tell the students they will be learning how to create a dichotomous key, which is a tool that people use to organize scientific information so it can be identified more easily.
3. Lead the students through this process in the following way:
  - A. Ask the students to divide themselves into two groups. The two groups must include all students. (For example; boys and girls, or people with shoelaces and no shoelaces.) The categories must always be observable. Qualities such as age, virtues, etc., do not apply.
  - B. Ask each group to divide itself into two subgroups. Each subgroup must include all members of the main group. Let the students decide on the criteria. Call on each group to define themselves by criteria.
  - C. Each of these subgroups must divide into two more subgroups. As before, these smaller groups must contain all members. No one should be left out. Again, have the groups define themselves by the criteria they have chosen
4. On the board, create the dichotomous key using the divisions that the students made. (See dichotomous key illustration included in this lesson)
5. To practice further, divide the students again by a different observable characteristic. Allow the groups to divide themselves again and have opposite teams try to determine the physical feature that divides them. Continue on for one or two more divisions.

**Now classify materials from nature:**

1. Have each student collect eight different plants, plant parts, or pictures of animals
2. Provide each student with a blank dichotomous key (included in lesson)
3. Guide the students through creating a key for their leaves in the following way:
  - A. Divide the chosen material into two categories. Use the areas of Structure and Function, Growth & Development, or Information Processing (see description of these categories in OBJECTIVES above). Write a simple description of each category on the lines marked #1. For example divide animals by ways in which they move about or divide plants by leaf shape)

- B. Look at each of your main groups separately. Now divide each of the two groups into two subgroups. Write these descriptions on the lines marked #2. For example, 'ways in which animals hide'. Divide animals into categories based on the ways in which they avoid predators. The kids might identify camouflage and escape (there might be some that use both!)
- C. If possible, divide each of these subgroups one more time. Write these descriptions on the lines marked #3. For example can the camouflage category be divided into animals which change appearance (chameleon & white hare) and those which do not (insect called walking stick, owls, deer)

### **SCHOOL YARD or GARDEN IDENTIFICATION KEY**

1. Challenge the students to create a dichotomous key for other materials. Make sure they always use observable properties of the materials. Leaf example as follows:
  - Collect a sample leaf from different trees on the property.
  - Identify each leaf using a tree identification guide.
  - Create a key using the categories such as conifer or deciduous, alternate or opposite branching, simple or compound leaves, etc...

Produce from the garden, weeds, soil particles and other items from garden are possible materials for the classification process.

**TIME:**

1 activity-**30 to 45 min**

## **PROCESSING THROUGH THE SIX PILLARS:**

### **WHAT HAPPENED?**

- Did you use your senses to determine the observable properties. ?
- Which senses?

### **SO WHAT?**

- Did you respect each other by listening to everyone's ideas and suggestions?

### **NOW WHAT?**

- What else can you collect and put into a Dichotomous Key?

## Examples of Dichotomous Key

