



What is it?

Dichotomous Keys

Biologists use dichotomous keys to identify various things such as trees, insects, and algae. A dichotomous key is a tool for determining the identity of something by going through a series of choices that leads the user to the correct name of the item.

Dichotomous means "divided in two parts". At each step of the process of using the key, the user is given two choices; each alternative leads to other choices until the item is identified.

When using a key, you should:

- Read and consider both choices, even if the first one seems to be appropriate.
- Be sure you understand the meaning of the words used in each choice. If you are not sure of the meaning, look it up in a dictionary.
- When there are measurements given in the choices, use the appropriate measuring tools. Do not approximate and do not guess.

Part 1: Using a Dichotomous Key to Classify Frogs

1. Observe the six frogs in your bag. These frogs are all members of the fictitious Genus *Frogus*. What are three examples of characteristics that are shared by all of the members of the Genus *Frogus*?

2. What are three examples of characteristics that are shared by some, but not all, of the members of the Genus *Frogus*?

3. What are three examples of characteristics that are unique to only one type of frog?

4. In this lab activity, you will use the *Dichotomous Key to Plastic Frogs* in your kit to identify the six plastic frogs.
5. Practice using the dichotomous key by classifying the frog with a letter "A" written on its belly. This frog is yellow with red stripes.
6. If you have done this correctly, the route you would follow is **1B – 6A – 7B – 8A**. The scientific name of the frog is *Frogus croaker*.
7. Use the *Dichotomous Key to Plastic Frogs* to classify the remaining frogs. For each frog that you classify, write the "route" (for example, 1B – 6A – 7B – 8A) that you followed to classify this frog and the scientific name of the frog in the table below.

| Letter on Frog's Belly | Route to classify the frog | Scientific name |
|-------------------------------|-----------------------------------|------------------------|
| A | 1B - 6A - 7B - 8A | <i>Frogus croaker</i> |
| B | | |
| C | | |
| D | | |
| E | | |
| F | | |

8. A student had trouble with classifying one of the frogs. He was not sure whether it was striped or spotted. He was not sure whether it was thin or round. If he selected "2A. Body is thin and smooth" on the key, the rest of the key didn't seem to apply to the frog he was classifying. What do you think he should do?

Part 2: Making a Dichotomous Key to Classify Lizards

The owner of the World of Pets store would like you to make a dichotomous key that customers could use to identify the lizards in the store's lizard habitat. In this part of the lab activity, you will make and then test your own dichotomous key for the lizards in the habitat.

1. Use the lizard collection and the *Classification Graphic Organizer* in your kit for this part of the activity.
2. Study the collection of plastic lizards and notice their different characteristics such as shape, size, color, and marking patterns. Divide the lizards into two groups of three based on their characteristics. The members of each group should share a common and easily identifiable characteristic.
 - Place one group of three lizards onto the 1A box on the *Classification Graphic Organizer*.
 - Place the other group of three lizards onto the 1B box.
3. What characteristic do the three lizards in group 1A have in common? Write this characteristic in the 1A box.
4. What do the three lizards in group 1B have in common? Write this characteristic in the 1B box.
5. Now, look at the three lizards in the 1A group. Divide them into two groups based on their characteristics.
 - Place the group of two lizards onto the 2A box.
 - Place the other lizard onto the 2B box.
6. What characteristic do the two lizards in group 2A have in common? Write this characteristic in the 2A box.
7. How is the lizard in the 2B box different from the two lizards in the 2A box? Write this characteristic in the 2B box. Also write the letter on the bottom of the lizard in the 2B box.
8. Now look at the characteristics of the two lizards in the 2A group. Place one lizard into the 3A box and the other lizard into the 3B box.
9. How is the lizard in the 3A box different from the ones in the 3B box? Write the appropriate characteristics in the 3A and 3B boxes. Also write the letter on the bottom of the lizard in each box.

10. Now, use the lizards in the 1B group and complete the *Classification Graphic Organizer* for boxes 4A, 4B, 5A and 5B.

11. Transfer the information from your *Classification Graphic Organizer* onto the blank *Dichotomous Key to Plastic Lizards* on the next page. Instead of writing the scientific name in the right column to identify each lizard, you should write the letter that is marked on the belly of the lizard.

Dichotomous Key to Plastic Lizards

| | |
|-----|--------------|
| 1A. | Go to 2 |
| 1B. | Go to 4 |
| 2A. | Go to 3 |
| 2B. | Letter _____ |
| 3A. | Letter _____ |
| 3B. | Letter _____ |
| 4A. | |
| 4B. | |
| 5A. | |
| 5B. | |

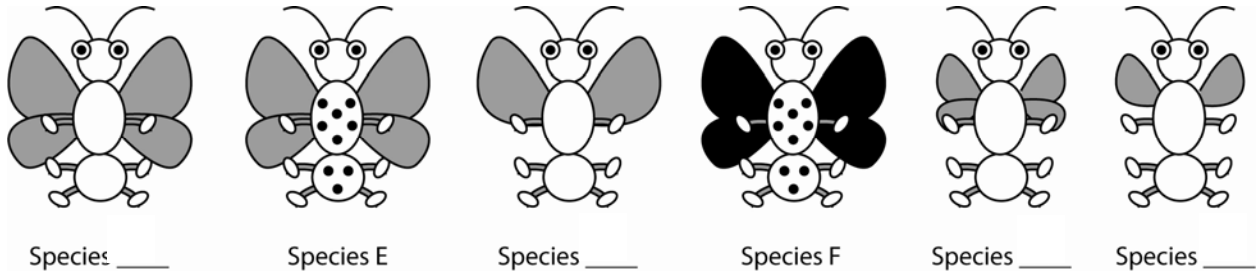
12. Test your key by asking several friends or adults to use your key to identify the lizards.

- If you have made your key correctly, they should be able to tell you the letters on the belly of the lizards without turning them over.
- If people cannot use your key to identify the lizards correctly, revise your key and test it again.

13. Another student made a key that is different from yours. Do you think this means that your dichotomous key, or the key made by the other student, is incorrect? Explain why or why not.

Part 3: Applying What You Learned

This diagram represents six insect species.

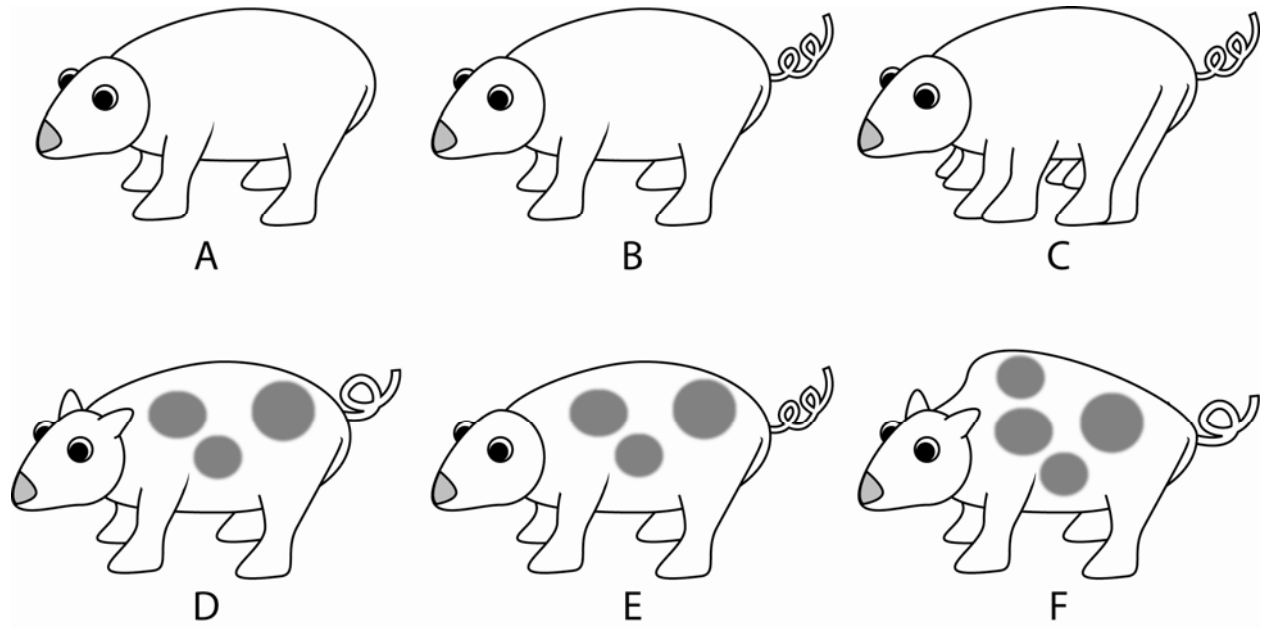


A dichotomous key to these six species is shown below:

| | |
|--------------------------------|-----------|
| 1A. Has small wings | Go to 2 |
| 1B. Has large wings | Go to 3 |
| 2A. Has a single pair of wings | Species A |
| 2B. Has a double pair of wings | Species B |
| 3A. Has a double pair of wings | Go to 4 |
| 3B. Has a single pair of wings | Species C |
| 4A. Has spots | Go to 5 |
| 4B. Does not have spots | Species D |
| 5A. | Species E |
| 5B. | Species F |

- Use the key to identify the drawings of species A, B, C, and D. Place the letter of each species on the line located below the diagrams of the species.
- Complete the missing information for sections 5A and 5B so that the key is complete for all six species.

This diagram represents six different species of fictitious animals.



3. Develop a dichotomous key for these six fictitious animals, below.

Your Dichotomous Key to Fictitious Animals

| | |
|-----|--------------|
| 1A. | Go to 2 |
| 1B. | Go to 4 |
| 2A. | Go to 3 |
| 2B. | Letter _____ |
| 3A. | Letter _____ |
| 3B. | Letter _____ |
| 4A. | |
| 4B. | |
| 5A. | |
| 5B. | |