

Dichotomous Key Lab# _____

Objective: to learn how to use and construct a dichotomous key

Introduction

All cultures have developed names for the living things found in their environments. When various everyday names are used for the same organism, confusion is possible. So, scientists have developed an international system for naming and classifying all organisms. Identification guides, called keys, have been developed to help all peoples recognize and identify organisms according to their scientific names. The word *dichotomous* comes from the word *dichotomy*, meaning “two opposite parts or categories.” A dichotomous key gives the reader a series of opposing descriptions of basic features of an organism. The reader studies the specimen and selects the descriptions that apply to it until reaching a statement that characterizes only one species and names it. In this investigation, you will use a typical dichotomous key to identify the genus and species of several different salamanders. Then, you will create your own dichotomous key to categorize a diverse group pretend monsters.

Part I. Using the diagram

1. Examine the drawings of the salamanders in Figure 1. Choose one salamander to identify by using the key.
2. Use the dichotomous key (Figure 2) to determine the genus and species of that salamander. Begin by reading statements 1a and 1b. One of the statements describes the salamander; the other statement does not. Follow the directions for the statement that applies to that salamander and continue following the correct statements until you have identified it. Record the scientific and common name of the salamander in the Data Table.
3. Repeat step 2 for each of the other salamanders in Figure 1.

Dichotomous Key Answers for Salamanders

Salamander Number	Scientific Name	Common Name
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

Figure 1: Salamanders

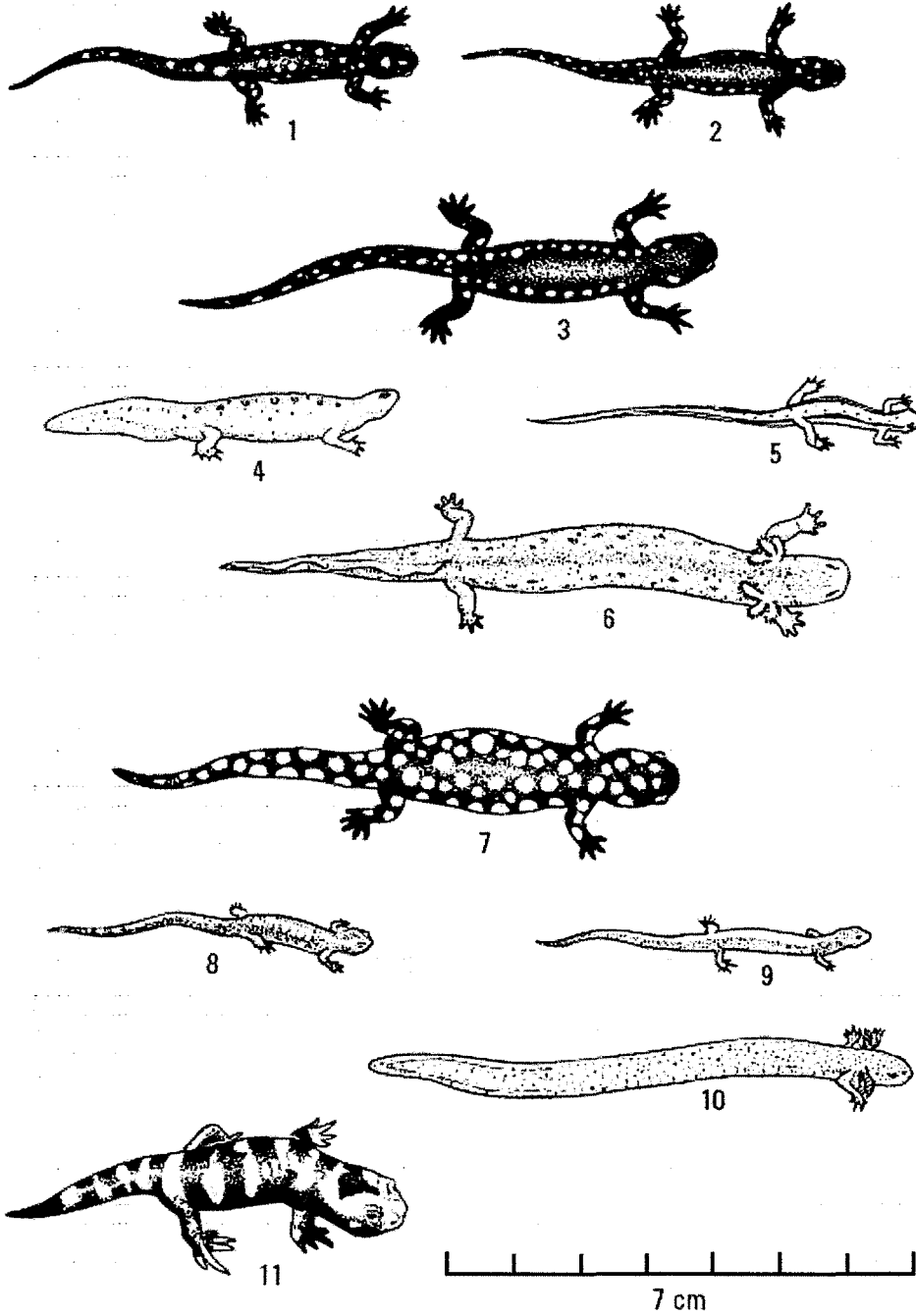


Figure 2: Salamander Dichotomous Key

1	a Hind limbs absent	<i>Siren intermedia</i> , siren
	b Hind limbs present	Go to 2
2	a External gills present in adults	<i>Necturus maculosus</i> , mud puppy
	b External gills absent in adults	Go to 3
3	a Large size (over 7 cm long in Figure 1)	Go to 4
	b Small size (under 7 cm long in Figure 1)	Go to 5
4	a Body background black, large white spots variable in size completely covering body and tail	<i>Ambystoma tigrinum</i> , tiger salamander
	b Body background black, small round white spots in a row along each side from eye to tip of tail	<i>Ambystoma maculatum</i> , spotted salamander
5	a Body background black with white spots	Go to 6
	b Body background light color with dark spots and/or lines on body	Go to 7
6	a Small white spots on black background in a row along each side from head to tip of tail	<i>Ambystoma jeffersonianum</i> , Jefferson salamander
	b Small white spots scattered throughout a black background from head to tip of tail	<i>Plethodon glutinosus</i> , slimy salamander
7	a Large irregular white spots on a black background extending from head to tip of tail	<i>Ambystoma opacum</i> , marbled salamander
	b No large irregular black spots on a light background	Go to 8
8	a Round spots scattered along back and sides of body, tail flattened like a tadpole	<i>Triturus viridescens</i> , newt
	b Without round spots and tail not flattened like a tadpole	Go to 9
9	a Two dark lines bordering a broad light mid-dorsal stripe with a narrow median dark line extending from the head onto the tail	<i>Eurycea bislineata</i> , two-lined salamander
	b Without two dark lines running the length of body	Go to 10
10	a light stripe running the length of body and bordered by dark pigment extending downward on the sides	<i>Plethodon cinereus</i> , red-backed salamander
	b A light stripe extending the length of the body without dark pigment on the sides	<i>Hemidactylium scutatum</i> , four-toed salamander

Part II: Constructing a Dichotomous Key

1. Below 10 imaginary monsters are pictured. Name your monsters. Be creative!
2. Make a dichotomous key flow chart similar to the one you created for your shoes by dividing your monsters into smaller groups based on trait at a time, such as “does the monster have wheels?” Draw your flowchart on separate paper and attach it to this lab.
3. Now create your own dichotomous key from your flow chart. Write this chart on separate paper as well.

Figure 3: The Monsters



1. _____



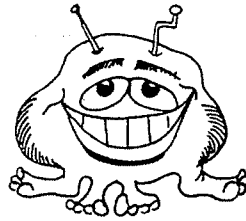
2. _____



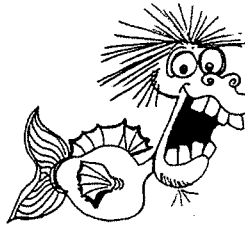
3. _____



5. _____



4. _____



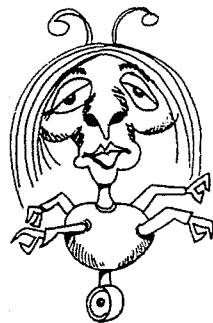
7. _____



8. _____



6. _____



10. _____



9. _____

Conclusions: Please answer all conclusion questions on separate paper and in full sentences please!

1. Based on the information in the salamander key, what is a distinguishing characteristic of the members of the genus *Ambystoma*?
2. Hypothesize as to why biological classification keys always use two rather than some other number of choices at each step.
3. Describe your strategy for creating your monster dichotomous flow chart and key.
4. Describe the kind of problems that scientists would experience today if Linnaeus had not developed his system of naming organisms?
5. Explain the meaning of the statement "classification systems are the inventions of humans; diversity is the product of evolution"
6. Do you think that there may be other closely related species that cannot be identified using such a classification system? Explain your answer.