

Pre-Lab Discussion

Suppose you find a large colorful wildflower while walking through the woods. Chances are the flower has already been named and classified, but how can you learn its identity? As an aid to help others identify unknown organisms, biologists have developed classification keys.

Many classification keys have been developed to help identify wildflowers and many other kinds of plants and animals. Although these keys may vary in purpose and complexity, they have certain features in common. These classification keys are often called dichotomous keys. The word dichotomous comes from the word dichotomy, meaning "two opposite parts or categories." A dichotomous classification key presents the user with two opposite statements about some trait of an organism. By choosing the statement that best describes the unknown organism, the user is led to further pairs of statements. By going from one set of statements to another, the name of the organism or its classification group is finally determined.

Using the attached images of salamanders and the accompanying key, identify each salamander by scientific and common name. Next do the same for the Fishes.

	Salamanders		Freshwater Fish
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
		12	
		13	
		14	
		15	
		16	
		17	
		18	

Analysis and Conclusions

1. As you used the classification key to identify the salamanders, describe the trend in the trait questions in terms of general or specific
2. What two grouping do the scientific names of the salamanders represent?
3. Do you think that there may be some closely related species of organisms that cannot be identified with a classification key? Explain your answer
4. Why do you think that biological classification keys always present two, rather than some other number, of choices at each step?
5. What types of problems would scientists have today if Carolus Linnaeus had not developed his classification and naming system for organisms?
6. Explain what is meant by the statement "Classification systems are the inventions of humans: diversity is the product of evolution."

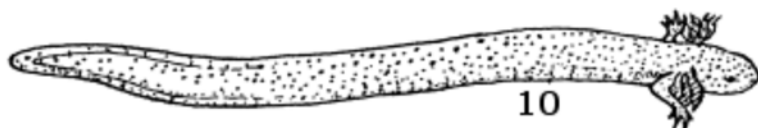
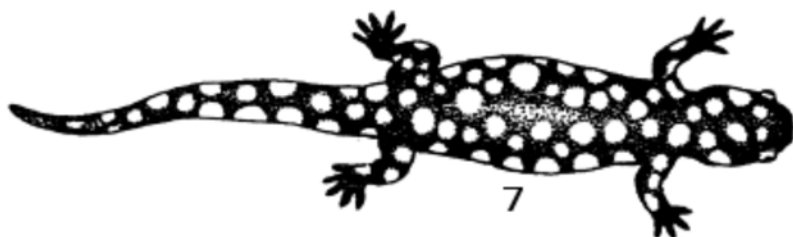
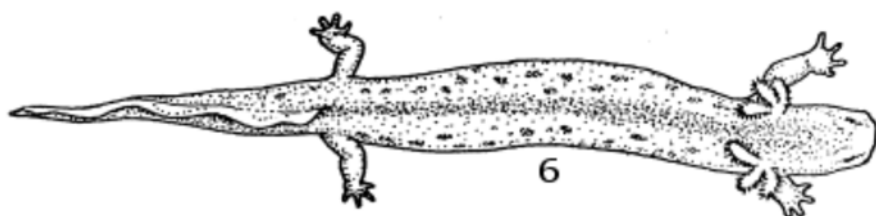
Classification Key To Certain Salamanders and Relatives

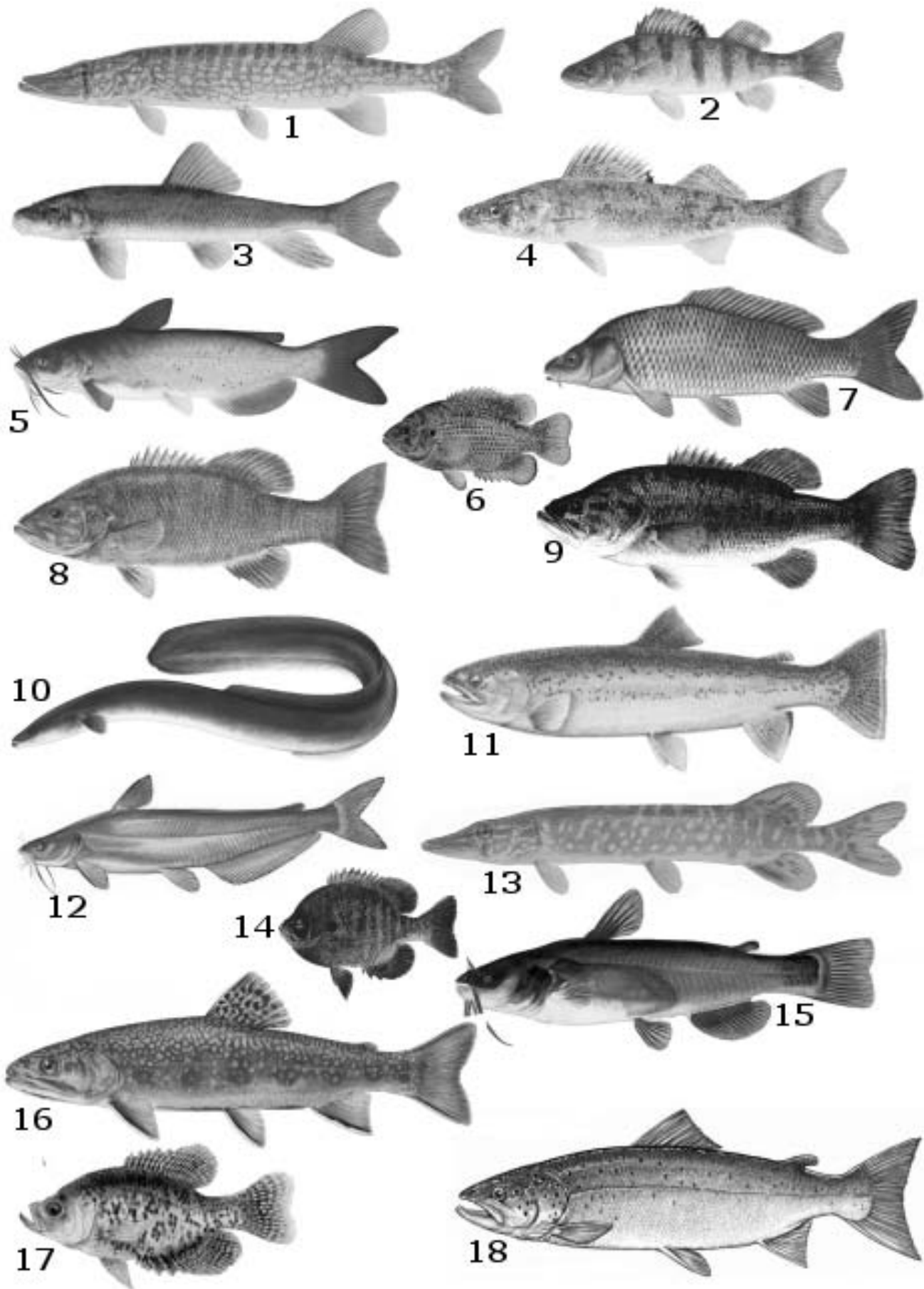
Start with salamander 1 and read statements starting with 1a and 1b. Only one of these statements is true for each salamander. Continue reading through the list and on a separate sheet of paper numbered 1-11, identify the scientific and common name of each salamander.

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 8 cm long	Go to 4
	b Small size, under 8 cm long	Go to 5
4	a Body background black, large white spots irregular in size and shape 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 a 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 black spots on a light 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 middorsal 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 the body	Go to 10
10	a A light stripe running the length of the 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, a marked constriction at the base of the tail	<i>Hemidactylium scutatum</i> , four-toed salamander

Classification Key To Certain Common Freshwater Fishes

1	A	Body noticeably covered with scales	2
	B	Scales not covering body or too small to be seen	12
2	A	Dorsal fin single	3
	B	Dorsal fin two or more, joined or separated	6
3	A	Body more than 4 times as long as broad (top to bottom); front edge of dorsal fin far back on body; mouth large, hinge in back of eye	4
	B	Body less than 4 times as long as broad (top to bottom); front edge of dorsal fin about midway between head and tail; mouth not large, hinge in front of eye	5
4	A	Dark lines forming netted design on body; fins not spotted	Pickereel
	B	Body covered with spots; fins spotted	Northern Pike
5	A	Mouth turned downward; barbels absent; dorsal fin not elongated	White Sucker
	B	Mouth not turned downward; barbels present; dorsal fin elongated	Carp
6	A	Two dorsal fins separated, the anterior spiny and the posterior soft	7
	B	Two dorsal fins united, forming an anterior spiny portion and a posterior soft portion	8
7	A	Top of head concave, forming a hump in front of dorsal fin; dark vertical bars on body	Yellow Perch
	B	Top of head not concave, body sloping to dorsal fin and not forming a hump; dark blotches on body.	Walleyed Pike
8	A	Body more than 3 times as long as broad	9
	B	Body less than 3 times as long as broad	10
9	A	Hinge of jaws behind the eye; notch between spiny and soft dorsal fin deep and nearly separating into two fins	Largemouth Bass
	B	Hinge of jaws behind the eye; notch between spiny and soft dorsal fin not nearly separating into two fins	Smallmouth Bass
10	A	Mouth large, hinge below or behind eye	11
	B	Mouth small, hinge in front of eye	Bluegill
11	A	5 to 7 spines in dorsal fin; dark spots forming broad vertical bars, or partial bars, on sides	White Crappie
	B	Ten or more spines in dorsal fin; sides flecked with dark spots	Rock Bass
12	A	Body much elongated and snakelike; dorsal, caudal and anal fins continuous	Eel
	B	Body not elongated and snakelike; dorsal, caudal and anal fins separate; adipose fin (on back near tail) present.	13
13	A	Barbels growing from lips and top of head; head large and broad	14
	B	Barbels lacking; head not large and broad	16
14	A	Caudal fin deeply forked; head tapering	15
	B	Caudal fin rounded or slightly indented but not forked; head blunt	Bullhead Catfish
15	A	Dorsal fin rounded at top; body silvery, speckled with black markings	Channel Catfish
	B	Dorsal fin long and pointed at top; body bluish-gray without speckles	Blue Catfish
16	A	Caudal fin deeply forked, back not mottles and with few spots	Atlantic Salmon
	B	Caudal fin square or slightly indented; back mottled or spotted	17
17	A	Back and caudal fin spotted; broad horizontal band along sides	Rainbow Trout
	B	Back mottles with dark lines; Caudal fin not spotted; fins edged with white	Brook Trout





Freshwater fishes, NOT to scale.