

ACTIVITY #2 5TH GRADE: BIODIVERSITY

STEP 1: THE PROBLEM

You are an ecologist working in Aiken County, SC. Your goal is to sample the biodiversity of one of three local habitats: the Upper Three Runs Creek stream corridor, a sandhills habitat, or a pine plantation.

On the data sheet you have been provided, circle the habitat that you will sample today. Be sure to also write your name, your teacher's name, and the name of your school on the data sheet.

STEP 2: DATA COLLECTION

You and a partner will work as a team to sample either the plants or the animals of your habitat. Select one member of your team to be the **SAMPLER** and one to be the **DATA RECORDER**.

Trial 1: Shake up your "habitat" to mix the species cards and cover the eyes of the **SAMPLER** with a blindfold (no peeking allowed!). The **SAMPLER** will then draw 20 cards from the habitat, one at a time, while the **RECORDER** writes down the letters or numbers, in the exact order that they are drawn from the habitat.

Trial 2 & 3: Return the sampled species to the habitat bag and shake well. Repeat the procedure used in Trial #1 two more times, being careful to write down the species sampled in the exact order they are drawn. Be sure to put all sampled species cards back in the habitat and shake it well before you begin a new sampling trial.

Trial 4, 5, & 6: Switch places with your partner: the person who was the **SAMPLER** now becomes the **DATA RECORDER** and the person who was the **RECORDER** now gets to wear the blindfold and sample the habitat. Repeat the sampling three more times, for a total of six trials. Be careful to write down the species sampled in the exact order they are drawn. Be sure to put all sampled species cards back in the habitat before you begin a new sampling trial. Shake up your habitat between samplings.

STEP 3: DATA ANALYSIS

- A. To compute the Biodiversity Index of the plants or animals from the habitat you sampled, look at the data you collected in Trial #1. Compare the letter or number in the first space of this row with the letter or number in the second space. If these two letters/numbers are the same, write a "0" in the circle below these two entries. If these two letters/numbers are different, write a "1" in the circle. Continue comparing each pair of letters or numbers (compare the letter/number in space 2 to the letter/number in space 3; then compare space 3 to space 4, then compare space 4 to space 5, etc.), writing a 0 or a 1 in the circle below each pair.
- B. Now add up the 0s and 1s and put the sum in the space provided at the end of the Trial #1 row. Divide this number by 19 (a reference table has been provided to help you with this step) and enter the answer in the box. [*hint*: the answer you get should be between 0 and 1]
- C. Repeat these pairwise comparisons [steps A and B] for all the species sampled in each of the six trials.
- D. Copy the answers you got in steps B and C into the boxes at the bottom of your data sheet. Add up these 6 numbers and divide the sum by 6 to get the average biodiversity for the six trials. Write this number in the rectangle at the bottom of the data sheet. This is the **BIODIVERSITY INDEX** for the plants or animals you sampled from your habitat.

STEP 4: COMPARE

Refer to the bar graph “Biodiversity Indexes of Three Coastal Plain Habitats” at the front of the room and the species totals on your “Habitat Species Key” to answer the questions below.

1. Compare the Biodiversity Index of **your** habitat to the Biodiversity Indexes of the other two habitats sampled by your classmates:
 - a) Which habitat had the highest plant biodiversity? [circle one]
stream sandhills pine plantation
 - b) Which habitat had the highest animal biodiversity? [circle one]
stream sandhills pine plantation
 - c) Which habitat had the lowest plant biodiversity? [circle one]
stream sandhills pine plantation
 - d) Which habitat had the lowest animal biodiversity? [circle one]
stream sandhills pine plantation

2. Compare the Biodiversity Index you calculated to the Biodiversity Indexes calculated by other groups that sampled the same habitat you did. Was your Biodiversity Index **higher** **lower** **equal** [circle one]

3. Compare the species you sampled in your six trial with the list of plants and animals that were actually present in your habitat. Refer to the total son your “Habitat Species Key.”
 - a) Which species did you sample most often? _____
 - b) Which species did you sample least often? _____
 - c) Were there any species in your habitat that you did not sample? _____
 - d) Write the names of two species that were actually in your habitat, but were not sampled in any of the six sampling trials you conducted:

DIVISION TABLE

1 ÷ 19 =	0.053	11 ÷ 19 =	0.579
2 ÷ 19 =	0.105	12 ÷ 19 =	0.632
3 ÷ 19 =	0.158	13 ÷ 19 =	0.684
4 ÷ 19 =	0.211	14 ÷ 19 =	0.737
5 ÷ 19 =	0.263	15 ÷ 19 =	0.789
6 ÷ 19 =	0.316	16 ÷ 19 =	0.842
7 ÷ 19 =	0.368	17 ÷ 19 =	0.895
8 ÷ 19 =	0.421	18 ÷ 19 =	0.947
9 ÷ 19 =	0.474	19 ÷ 19 =	1.000
10 ÷ 19 =	0.526		

Data Sheet for Biodiversity Sampling

name: _____

school & teacher: _____

Trial # Habitat sampled (circle one): stream sandhills pine plantation

1

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6 = this is the biodiversity index for your habitat

TEACHER: _____ NAME: _____

**HABITAT SPECIES KEY
SANDHILLS HABITAT**

<i>Designation</i>	<i>Plants</i>	<i>Actual population</i>	<i>Total Sampled</i>
A	turkey oak	250	
B	longleaf pine	250	
C	poison oak (clumps)	40	
D	needle grass	30	
E	hawthorne	100	
F	prickly pear cactus	60	
G	yucca	40	
H	nettle	40	
I	sassafras	80	
J	reindeer moss (lichen)	50	
K	persimmon	30	
L	gopher weed	30	
Total plants		1,000	
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<i>Designation</i>	<i>Animals</i>	<i>Actual population</i>	
1	southern toad	30	
2	spadefoot toad	65	
3	pine snake	3	
4	so. hognose snake	3	
5	gopher tortoise	5	
6	box turtle	2	
7	racerunner	40	
8	glass lizard	5	
9	broadheaded skink	7	
10	ground skink	15	
11	armadillo	3	
12	cotton rat	7	
13	scorpion	20	
14	grasshopper	60	
15	ant mounds	30	
16	wolf spider	40	
17	red centipede	70	
18	crickets	90	
19	beetle	5	
Total animals		500	

TEACHER: _____ NAME: _____

**HABITAT SPECIES KEY
PINE PLANTATION HABITAT**

<i>Designation</i>	<i>Plants</i>	<i>Actual population</i>	<i>Total Sampled</i>
A	loblolly pine	690	
B	bluestem grass	20	
C	blackberry	70	
D	muscadine	40	
E	wax myrtle	60	
F	sweetgum	30	
G	dogwood	20	
H	goldenrod	15	
I	bracken fern	25	
J	reindeer moss (lichen)	20	
K	turkey oak	5	
L	black gum	5	
Total plants		1,000	
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<i>Designation</i>	<i>Animals</i>	<i>Actual population</i>	
1	oak toad	5	
2	southern toad	15	
3	narrowmouth toad	100	
4	red-bellied snake	5	
5	scarlet snake	4	
6	scarlet kingsnake	3	
7	black racer	5	
8	copperhead	2	
9	fence lizard	15	
10	ground skink	100	
11	cotton mouse	6	
12	star-nosed mole	10	
13	turkey	10	
14	beetle	10	
15	millipede	10	
16	lynx spider	30	
17	fritillary	10	
18	cricket	100	
19	brown centipede	60	
Total animals		500	

TEACHER: _____ NAME: _____

HABITAT SPECIES KEY
UPPER THREE RUNS CREEK HABITAT

<i>Designation</i>	<i>Plants</i>	<i>Actual population</i>	<i>Total Sampled</i>
A	switch cane	80	
B	red maple	200	
C	aquatic grass (clumps)	80	
D	alder	120	
E	wax myrtle	100	
F	birch	100	
G	sweetgum	100	
H	greenbriar	50	
I	mushroom	50	
J	chain fern	50	
K	poison ivy	40	
L	Spanish moss	30	
Total plants		1,000	
<hr/>			
<i>Designation</i>	<i>Animals</i>	<i>Actual population</i>	
1	gar	3	
2	darter	25	
3	redbreast sunfish	20	
4	southern toad	25	
5	dwarf waterdog	20	
6	leopard frog	10	
7	brown water snake	5	
8	queen snake	3	
9	box turtle	4	
10	softshell turtle	5	
11	green anole	20	
12	river otter	5	
13	moth caterpillar	25	
14	crayfish	80	
15	water striders	70	
16	damselflies	50	
17	caddisflies	40	
18	diving beetles	60	
19	orb weaver spider	30	
Total animals		500	