Name________________________________ Date____________________________

The Pop Ecology Files—Student Worksheet

Part 1: Measuring Growth

1. If you had $100 and added $10 to it the first year and each successive year, how much money would you have...

a. After 5 years?

b. After 10 years?

Start	1	2	3	4	5	6	7	8	9	10
$100	$110									

c. Create a line graph to show your money's growth over 10 years.
This is arithmetic growth - growth that results from a constant rate of change over time.

2. If instead you had $100 and it grew by 10% each year, your money would be growing on an ever-increasing base. How much money would you have...

a. after 5 years?

b. After 10 years?

Start	1	2	3	4	5	6	7	8	9	10
$100	$110									

c. Using the graph above, add a second line to show how this money would grow over 10 years.
This is exponential growth, growth that results from a constant percent rate of change over time. Populations tend to grow the same way. Because the base population is always increasing, population grows exponentially, as long as there are sufficient resources. Without sufficient resources, a population would exceed its carrying capacity and decline.

3. Jefferson Middle School has 1000 students. A new housing development is being built nearby, and it is predicted that that the school population will increase 10% each year for seven years. How many students will there be in the school in seven years?

Start	1	2	3	4	5	6	7
1000							

Part 2: The Naturalist's dilemma

Your aunt left a stack of her papers with you while she was traveling in the wilderness. These papers include important population data that she has gathered on the species she's studied over the years. She's due back in town today, so you want to give her papers back to her, but they've gotten all mixed up. You have the data, and you know the list of species, but you can't tell what data goes with what species. By graphing the population data for each species, you'll be able to sort it all out.

Species list:

Species	Background	Where studied
Bacteria X (1st population)	A common bacteria found in soil.	Studied in a laboratory test tube over the course of several weeks.
Cerulean Warbler	This tiny migratory forest bird may be added to the endangered species list.	Central Maryland, over several years.
Bristlecone Pine	This slow-growing tree species can live several thousand years.	Eastern California, over several years.
Eastern Cottontail	The common fast-breeding rabbit from the eastern United States.	Central Ohio, over several years.
Red Fox	One of several predators on the cottontail rabbit.	Central Ohio, over several years.
Bacteria X (2nd population)	A common bacteria found in soil.	Studied in a laboratory test tube over several weeks. New nutrients provided regularly.

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Population data:

Species 1		Species 2		Species 3		Species 4		Species 5		Species 6	
Date	Pop	Date	Pop	Date	Pop	Date	Pop	Date	Pop	Date	Pop
Year 1	245	1/1/91	80	Day 1	2	5/91	236	Day 1	2	1/1/91	300
Year 2	243	4/2/91	35	Day 3	5	7/91	402	Day 3	5	4/2/91	280
Year 3	246	7/3/92	35	Day 5	10	5/92	221	Day 5	10	7/3/92	500
Year 4	250	10/1/92	45	Day 7	25	7/92	380	Day 7	25	10/1/92	1400
Year 5	247	1/2/93	75	Day 9	100	5/93	198	Day 9	100	1/2/93	400
Year 6	245	4/2/93	40	Day 11	350	7/93	324	Day 11	350	4/2/93	320
Year 7	250	7/1/94	38	Day 13	1000	5/94	187	Day 13	1000	7/1/94	600
Year 8	252	10/2/94	48	Day 15	2000	7/94	298	Day 15	1500	10/2/94	1260
Year 9	248	1/2/95	82	Day 17	4000	5/95	150	Day 17	1700	1/2/95	350
Year 10	250	4/2/95	40	Day 19	8000	7/95	267	Day 19	1850	4/2/95	320
Year 11	247	7/1/96	39	Day 21	10000	5/96	144	Day 21	1950	7/1/96	550
Year 12	245	10/1/96	45	Day 23	3000	7/96	254	Day 23	2000	10/1/96	900
Year 13	244	1/2/97	60	Day 25	1500	5/97	142	Day 25	2000	1/2/97	420
Year 14	243	4/2/97	41	Day 27	750	7/97	233	Day 27	2000	4/2/97	390
Year 15	248	7/2/98	38	Day 29	100	5/98	132	Day 29	2000	7/2/98	520
Year 16	248	10/1/98	53	Day 31	50	7/98	206	Day 31	2000	10/1/98	1020
Year 17	247	1/3/99	73	Day 33	25	5/99	122	Day 33	2000	1/3/99	260
Year 18	250	4/1/99	38	Day 35	10	7/99	152	Day 35	2000	4/1/99	250

4. Create line graphs for the six mystery species above. Consider how to scale the axes before you begin. Then, use the background descriptions to match the graphs with the species.

a. Species 1 =
Why?

b. Species 2 =
Why?

c. Species 3 =
Why?

d. Species 4 =
Why?

e. Species 5 =
Why?

f. Species 6 =
Why?

Part 3: the Human Growth Curve:

5. Now, plot the growth curve for humans, using data from the last 2000 years.

Year	1A.D.	200	400	600	800	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	1930	1960	1975	1987	1999
Pop. (In Millions)	170	190	190	200	220	265	320	360	360	350	425	545	610	1000	1500	2000	3000	4000	5000	6000