Name: _____

"Pond"ering Population Growth

Section 1: Pre-knowledge

1. What is a population?

2. How big can a population grow? Can it keep expanding forever?

3. What limits the size of a population?

Section 2: The Lily Pad Dilemma

Lily pads can grow fast! Imagine that you discover a variety of lily pads that can double in number every day. It only takes 10 days for them to grow to cover a pond halfway!

1. If it takes 10 days to cover the pond halfway, predict how many more days will it take to completely cover the pond?

    a. about 10 more days
    b. about 5 more days
    c. about 1 more day
    d. about 3 more days

2. Explain the reason for your prediction.

Section 3: Test Your Prediction

1. Imagine that your lab table is a pond.
2. Using a ruler, measure a rectangle 24" x 40" on your lab table and mark the edge with masking tape.
3. Pretend each index card is a lily pad.
4. Lay one card in the corner of the pond to represent the first lily pads.
5. Pretend a day has passed. Double the number of lily pads in your pond. Record on the back of this sheet.
6. Keep on doubling the population until the pond is half full.

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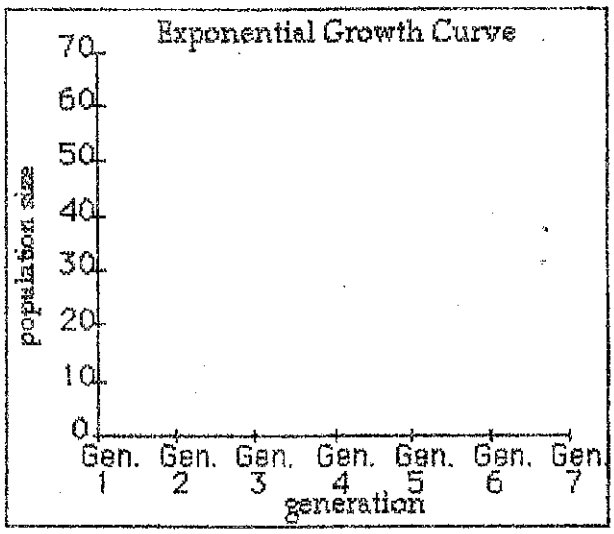
Generation (Number of Days)	Number of NEW Lily Pads in the Population	TOTAL Number of Lily Pads in the Population

Section 4: Application Questions:

1. Using your math skills, determine **exactly** how much time passed before the pond was precisely half full.

2. Based on your demonstration, determine exactly how many days will pass before the pond is completely full.

3. Now, make a graph of your results.



4. Describe the shape of your graph. Compare the growth in Generation 1 and 2 to the growth in Generation 5 and 6.

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Section 5: Analysis Questions

1. Describe the shape of your graph. Why isn't it a straight line? Why does the slope change over the generations? How do your math skills and knowledge help you understand the science content?

2. Predict the shape of the graph after the pond is completely full. (HINT: If you continued for generation 7 and 8, what would happen? How would that be shown on the graph?)

3. If the lily pads can no longer reproduce once the pond is full, what do you predict will happen to the size of the population and the shape of the graph?

4. Suppose a species is introduced to your pond that eats lily pads, how would this change the graph?

5. What if there was a sudden drop in temperature? What would happen to your lily pad population?

Linear and Exponential Population Growth & Graphing

Name:_____

Part 1: The Meaning:

Take notes on the linear and exponential population growth as your teacher leads a class discussion

Exponential Growth	Linear Growth

Part 2: The Math:

Sketch the two types of graphs based on their meaning. Revise your sketch after a class discussion, if necessary

Linear	*Exponential*	*Comparison*

Part 3: The Science:

List limiting factors that can affect the growth of a population. Be prepared to defend your list.