

# EF 1

## Exponential Growth

### Activity 2

### M&M Growth

Start with 4 M&Ms in a cup. Shake the cup and roll out the M&Ms. Count the number with "M" showing, multiply the number by 2, and add that many M&Ms to the population. Record the population and repeat 4 times.

(For example, when you rolled out your 4 M&Ms, three had "M" showing.  $2 \cdot 3 = 6$ , so add 6 to the population of 4, which gives you 10. Roll out the 10. Four had "M" showing,  $4 \cdot 2 = 8$ , so add 8 to the population of 10, which gives you 18.)

Your Data

Year	Population

Class Data

Year	Population

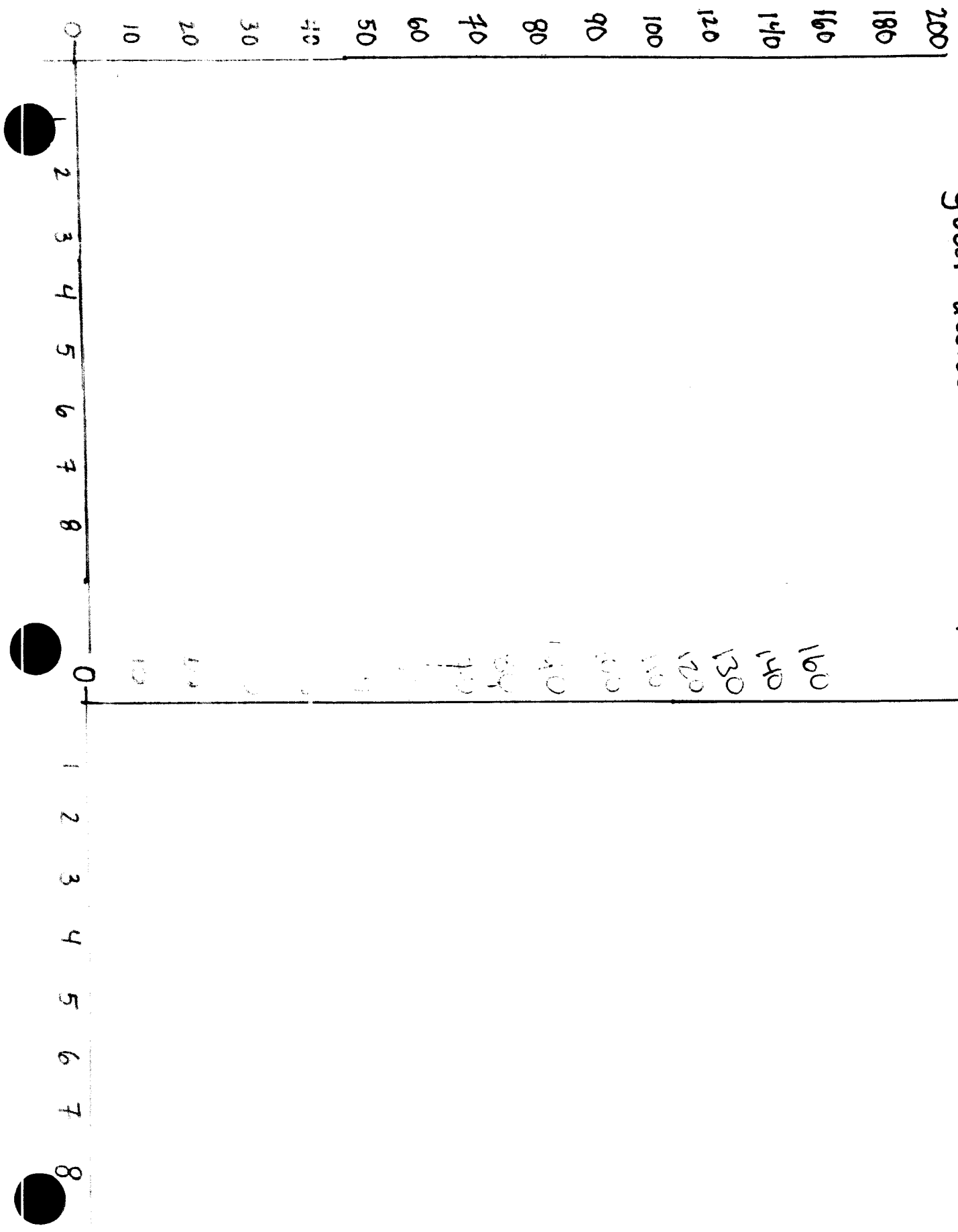
- What would you expect the population to be at each roll?
- How close were your results to what you would expect?
- Combine your data with the rest of the class and enter the combined data into lists in a calculator. Guess and check a model to fit the data.

17. Are the results more reasonable with all of the data? Take successive quotients to confirm your answer.
  
18. Using the quotients, find a model to fit the data. Check it by graphing the scatter plot and equation. Compare this model with your guess-and-check model.

M&W  
your data

Add Labels  
on Axes

M&W  
class data





## Exponential Growth Population Growth

1. In 1995 it was reported that there were 60,000 centenarians (people aged 100 or over) in the U.S. A researcher predicted a 7% annual growth rate and claimed that the number of centenarians would reach 232,000 by the year 2015.

$f(x) =$

	Year	Population	Process
	0	60,000	
→	1996	1	
→	1997	2	
→	1998	3	

2. Use a numerical approach to verify the statistic.
3. Write your process in the fourth column.
4. Write a NOW-NEXT equation for the problem.
5. When will the the centenarian population reach 1,000,000?



2. A wildlife scientist uses a model to find the projected deer population in a national forest. The data is shown in the table below.

Growth Rate is 3%.

	Year	Population	Process
2000	0	1500	
2001	1		
2002	2		
2003	3		
2004	4		
2005	5		
2006	6		
2007	7		

- Is the model linear or exponential? Explain.
- Determine the growth rate.
- Find an equation to model the growth.
- Use your equation to find the deer population in the year 2010.

Deer Population (Label Axes)

Centenarians Population

