

## Modeling Exponential Growth

For each exponential story problem, do the following:

- Write a function rule.
- Create a table of values.
- Graph the data.
- State whether the graph shows growth or decay.
- Answer the accompanying questions.

please write function rules as  $y = a \cdot b^x$ .  
writing it with a  $x$  as a multiplication sign  
looks like an  $x$ .

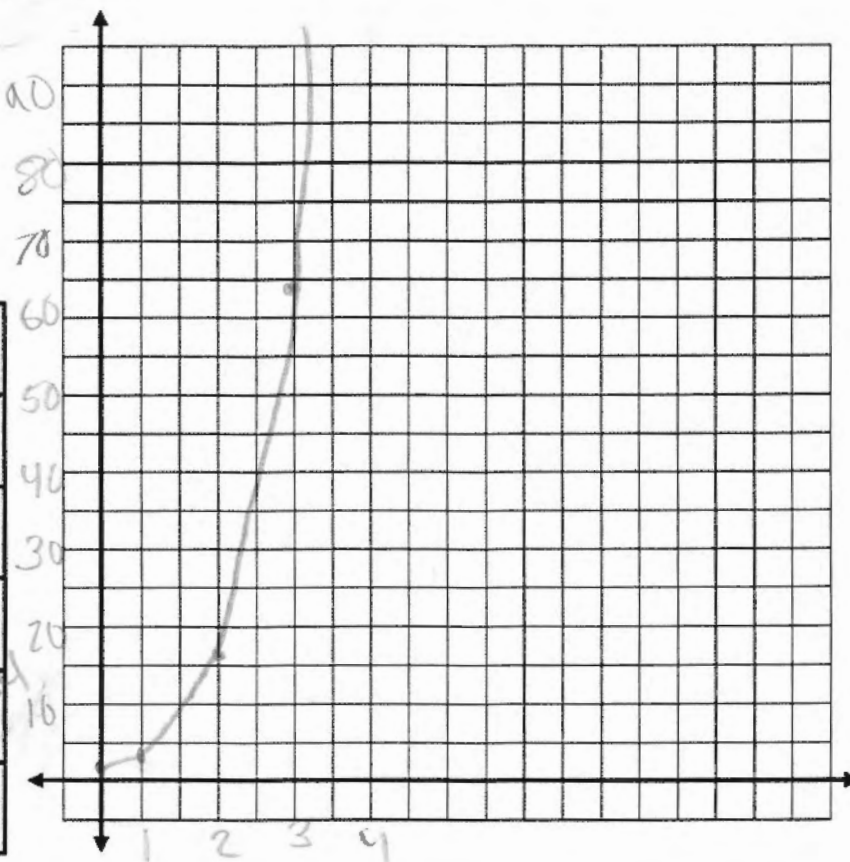
# 1. Zombie Apocalypse

A virus is turning people in Zombies! When the virus started spreading there was only one Zombie and the number of Zombies quadruples every week.

function should be  $y = 1.4^x$

multiplication  
or  
addition  $y = 1 + 4^x$

x	y
0	1
1	4
2	16
3	<del>64</del>
4	256



Question 1. How many Zombies will there be after 15 weeks?

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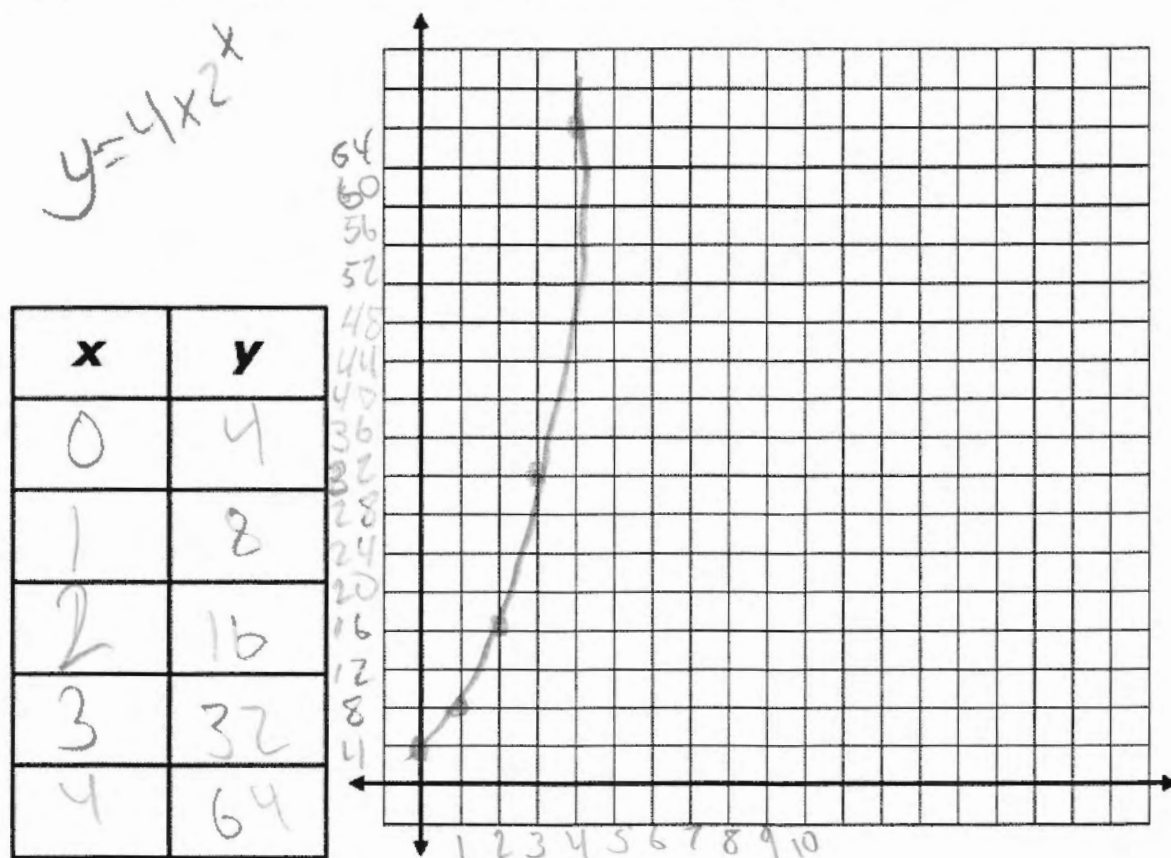
Question 2. When there are 1,000,000 people who have turned into Zombies the World Health Organization (WHO) will call the virus a pandemic. After approximately how many weeks will there be a pandemic?

?

Use guess & check to find when  $1,000,000 < 1.4^x$ .

## 2. Eagle Creek

At Eagle Creek Park there is a population of deer. When the deer first moved into Eagle Creek there were 4 deer and the number of deer doubles each month.



Function rule:

$$y = 4 \times 2^x$$

Please write the function  $y = 4 \cdot 2^x$

Question 1. How many deer will there be after 10 months?

Otherwise it looks like

$$y = 4x \cdot 2^x$$

41096

units?

Question 2. When there are more than 10,000 deer, Eagle Creek will have to move the deer to other parks in the state. After approximately how many months will deer have to be moved?

12,000

How?

What units?

what x makes

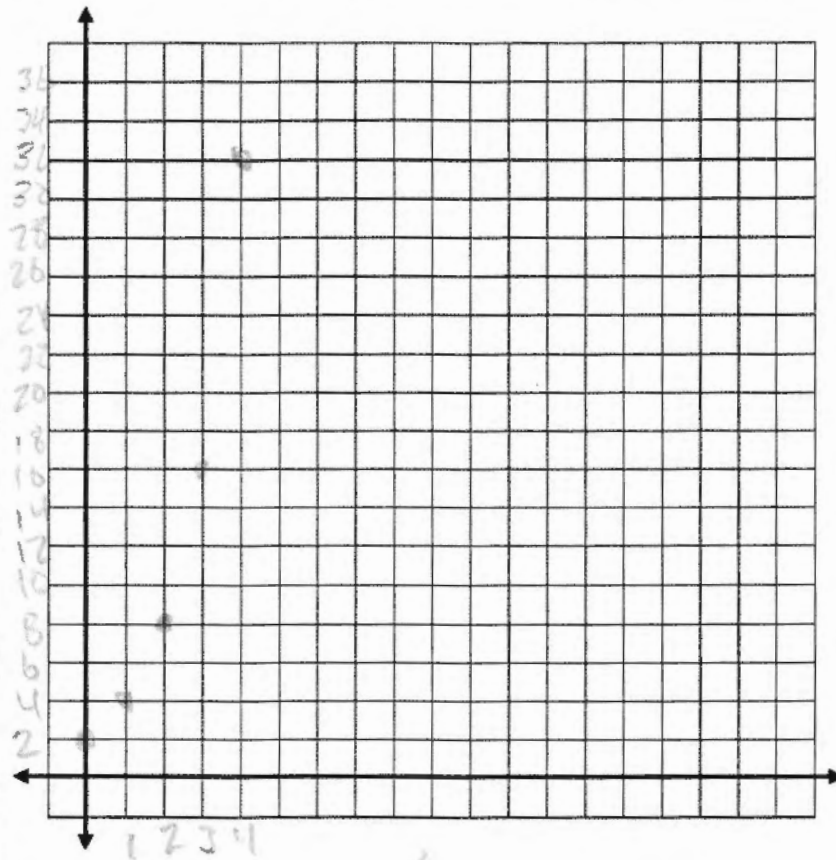
$$10,000 < 4 \cdot 2^x \text{ true?}$$

### 3. Guitar Club Membership

Mrs. Petrin is the sponsor for Guitar Club at Pike. During the first week of school she had 2 people join Guitar Club. The number of people joining Guitar Club doubles each week.

function rule?

x	y
0	2
1	4
2	8
3	16
4	32



Question 1. How many students are in Guitar Club after 4 weeks?

512

Question 2. Once Mrs. Petrin has more than 30 students join Guitar Club, she has to get a bigger room for them to use. After approximately how many weeks will Mrs. Petrin have to get a bigger room?

6 weeks

write how you got this.

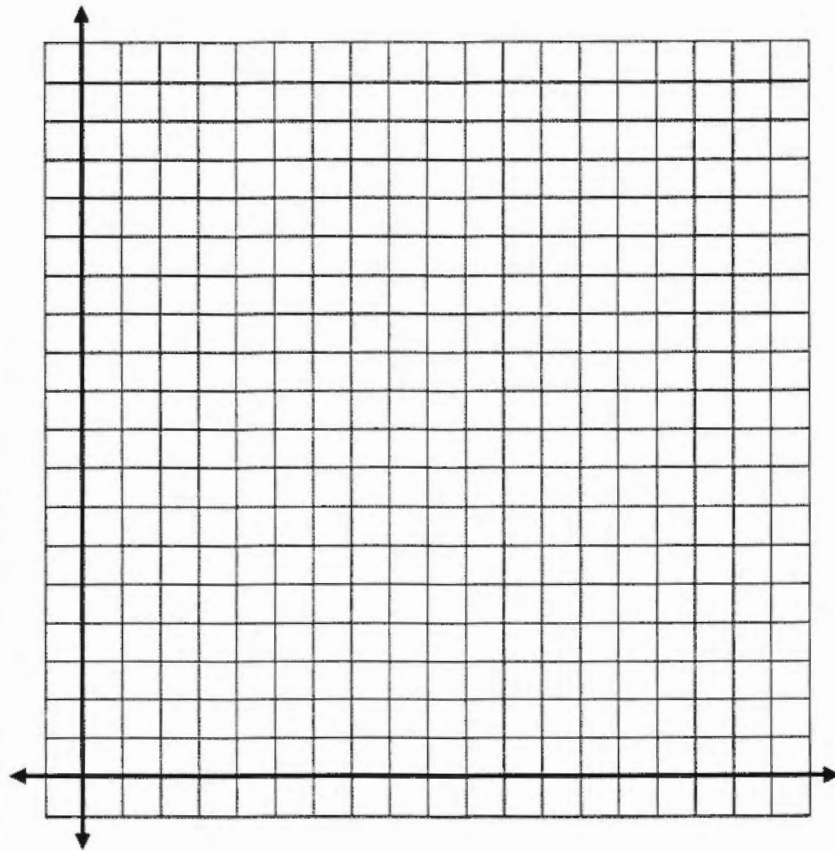


? What happend? Did your group not have enough time?

#### 4. Sick Day

Ms. Wraley came to Pike sick one day and got 3 students sick. The next day the sick students came to school and got other people sick. The number of students who get sick triples every day.

x	y



Question 1. How many students will be sick after 6 days?

Question 2. After half of the students at Pike (1,630 students) are sick, Mr. Inman has to cancel school. After approximately how many days will school have to be cancelled?