Himalayan Herds:
A Problem with Fractional Exponential Growth

Lesson Plan

Cube Fellow: Philip Busse **Teacher Mentor:** Beth McNabb

Goal:

Grade and Course: 8th grade, Pre-algebra

KY Standards:

MA-08-3.3.1 (Geometry: Coordinate Geometry)
MA-08-5.1.2 (Algebraic Thinking: Patterns, Relations, and Functions)
MA-08-5.3.1 (Algebraic Thinking: Equations and Inequalities)

Objectives:

Resources/materials needed:

- Worksheets (1 per student)
- Paper rabbit cut-outs (1 per group)
- scissors

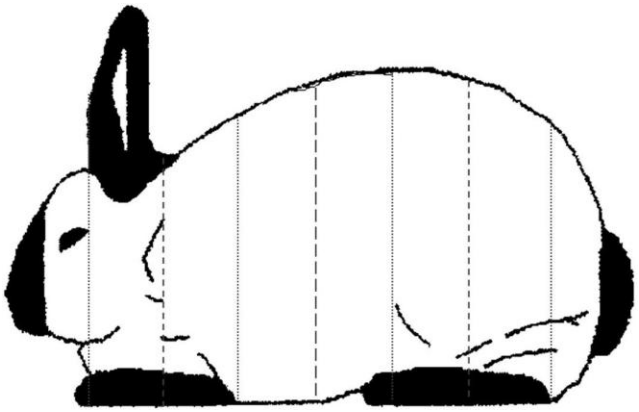
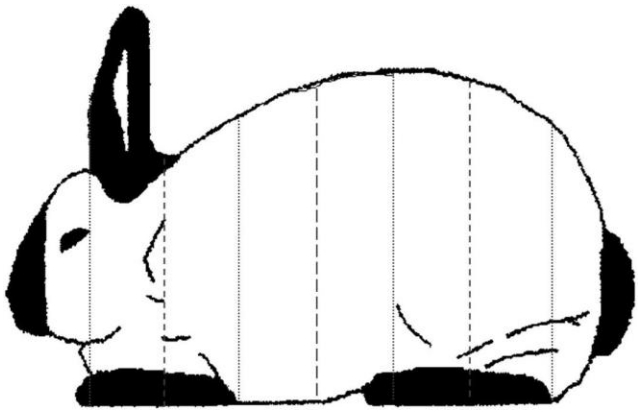
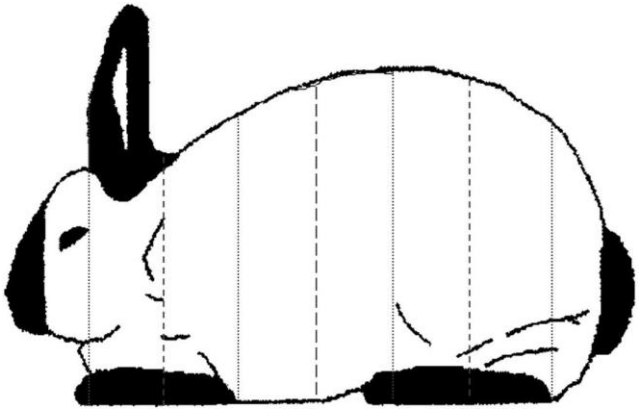
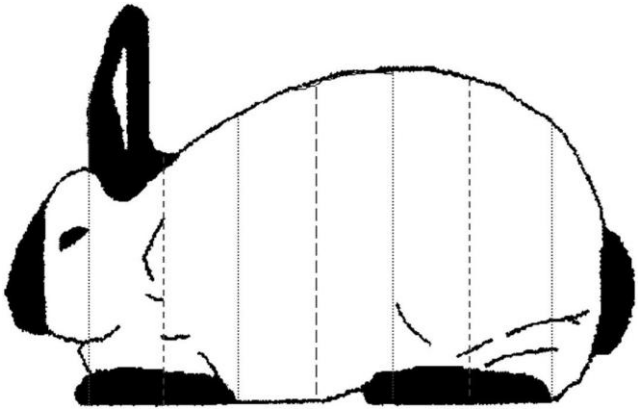
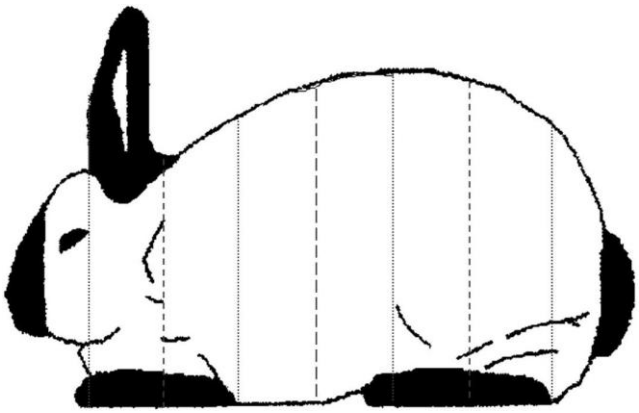
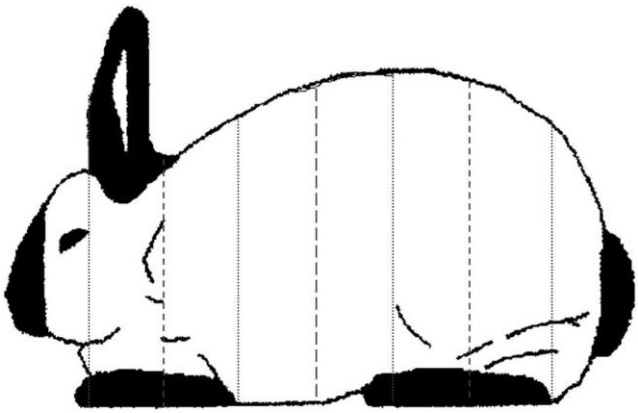
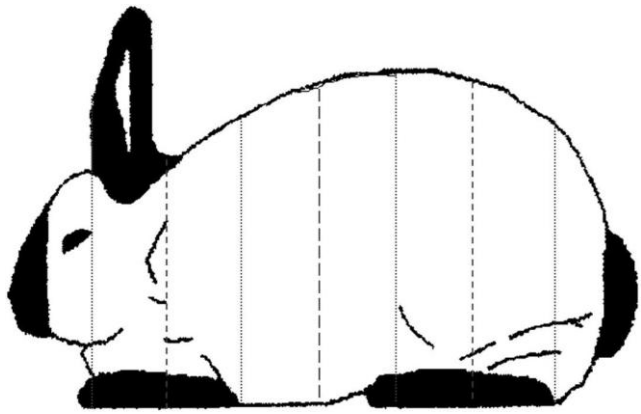
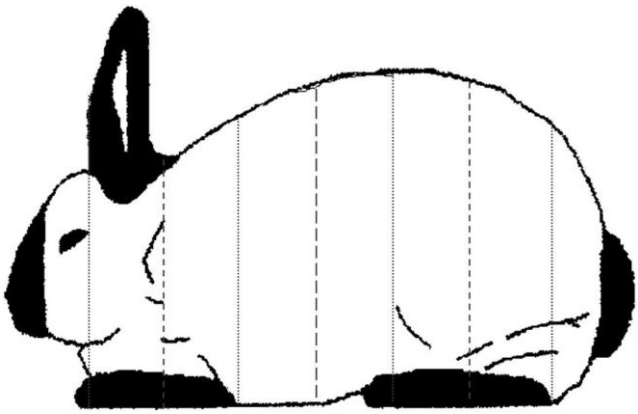
Description of Plan:

Lesson Source: This lesson was adapted from Problem 3.1 in *Connected Mathematics 2: Growing, Growing, Growing – Exponential Relationships.*

Instructional Mode: Group Activity

Date Given: 11-7-07 **Estimated Time:**

Date Submitted to Algebra^3:

Name:_____ Date:_____

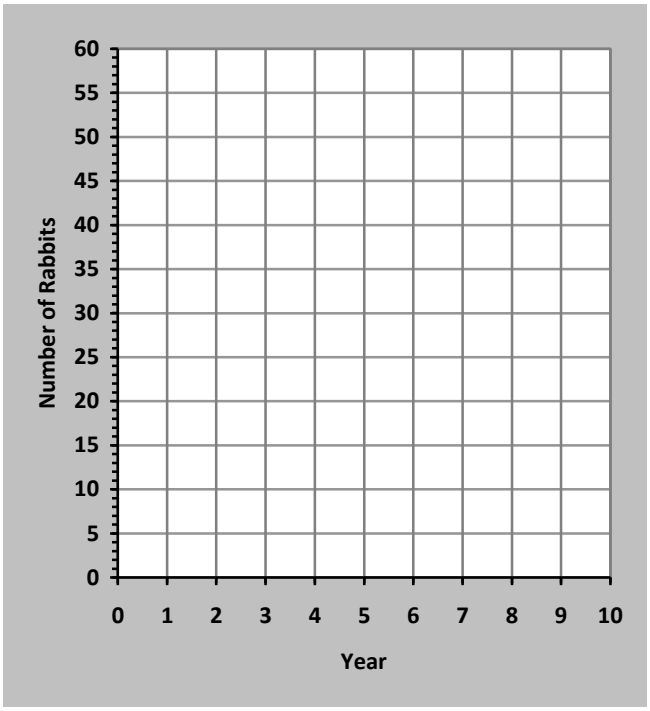
Sarah's Rabbits: Fractional Growth Factors

Sarah wants to raise a herd of Himalayan rabbits to present at state fairs and rabbit shows. She starts with a single Himalayan. The size of a herd of rabbits grows exponentially. This particular breed of rabbits increases by a growth factor of 1.5 each year.

A. Cut out between 4 and 8 paper rabbits and use them to represent the size of Sarah's herd after each of the first four years. Record the number of rabbits after each year in the following table.

Year	Number of Rabbits	Num. of Rabbits (part D)
0		

B. Make a graph depicting the number of rabbits in Sarah's herd during the first 10 years.



C. 1) What is the *y*-intercept of the graph you made?

2) Using what you learned about exponential growth equations in the last investigation, write an equation for the size of the herd after each year.

3) Explain what each number and each variable represents in the equation you wrote.

D. Suppose Sarah began with **four** rabbits instead of one.

1) Use the third column of the table in part A to show the number of rabbits after the first few years in this scenario.

2) Using the same axes you used before, draw a graph of the size of Sarah's herd over the first 10 years when she starts with four rabbits. How does this graph compare to the first one?

3) Write an equation again for the number of rabbits in the herd after each year.

4) How many rabbits will there be after 25 years? *(Round to the nearest whole rabbit)*

5) After how many years will the size of Sarah's herd exceed 1,000,000 Himalayans?