

Intervals

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Summary	Students reason about graphs showing growth over time. They compare heights of children and heights of two animals at different time intervals.
Goals	1. Focus on intervals, e.g., what happened if: $4 \leq a \leq 7$ [a in years] $45 \leq h \leq 55$ [h in inches]
Materials	Overheads, Handouts
Keywords	Compare/Contrast Functions Contextualized Situations Full Class Discussion Linear Functions Interpretation of Graphs Non-Linear Functions Production of Graphs Small Group Work
Practical Hints	Pay attention to the shape of curves suggested by children. See whether they draw continuous graphs. Do all children realize that growth will taper off? Will any represent shrinkage?

Activity Plan:

1. Graphing One's Height Over Time [Whole Class]

Distribute the handout in page 1 and ask children to draw a graph representing one's growth over one's lifetime (without numbering the x and y axes).

What would a steep line mean? And a horizontal straight line?... etc.

2. With the help of students, number the axes on the overhead (page 1) and ask a few of them to take turns showing their own expected growth. [Whole Class]

Don't suggest how to draw the graphs.

Some questions to ask:

What will a person's height look like when shown over their lifetime? Does one always grow taller? Are there periods when people grow more quickly? How to represent that?

Distinguish between linear, decreasing, and increasing rates of growth. What are the arguments in favor of each?

3. Ask students to number the axes on their handouts (page 1) and to draw a graph of their expected heights. Discuss Several Examples from Students. [Small Group and Whole Class]

Go over the children's examples. Use different colors for different kids.

Assume that the information is correct. What does it imply?

Eventually ask students to tell what happens in a particular interval:

$$4 \leq a \leq 7 \quad [a \text{ in years}].$$

Ask a student to state her age when she went through an interval such as...

$$45 \leq h \leq 55 \quad [h \text{ in inches}]$$

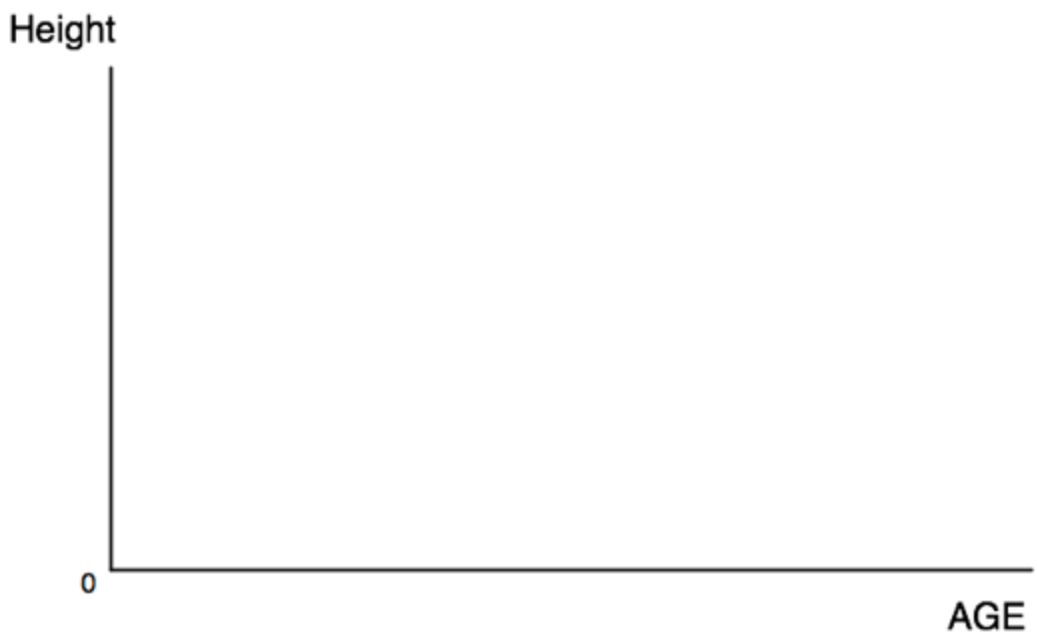
4. Distribute the second handout (page 2) and allow the students to work in groups to answer. [Group Work]

5. Homework (Page 3)

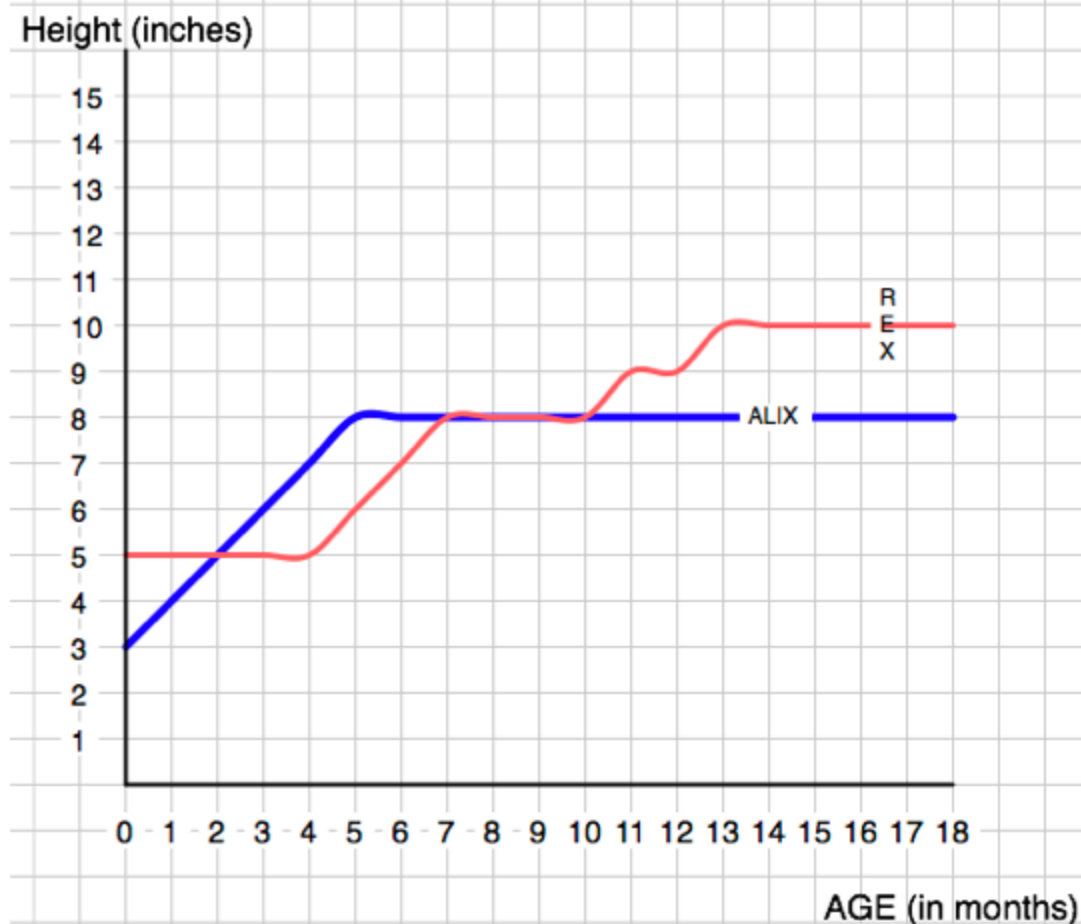
Students will work on a similar problem.

Overhead and Handout: Growing Over A Lifetime
(Page 1)

Name: _____ Date: _____



Name: _____ Date: _____



How tall was Alix when she was born? _____

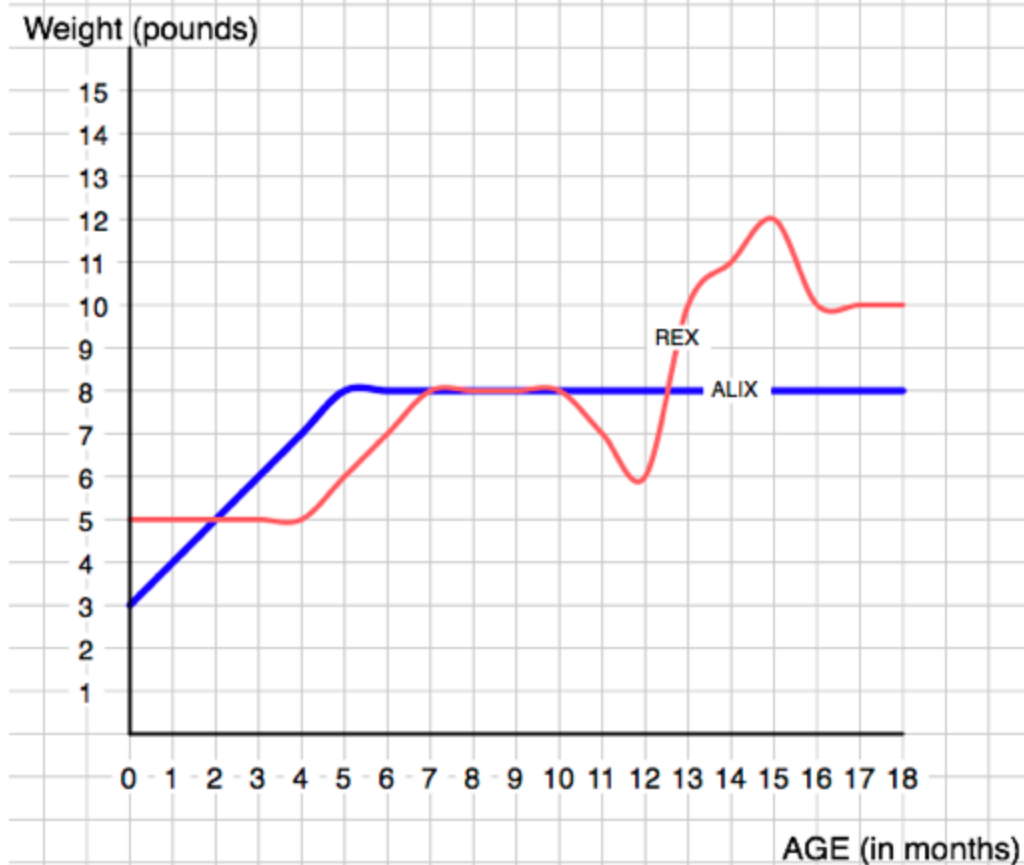
How tall was Rex when he was born? _____

Was there ever an age when Rex and Alix were the same height? _____

Was there ever an age when Rex and Alix grew just as fast? _____

Tell what happened in the interval, $6 \leq \text{Age} \leq 8$ _____

Name: _____ Date: _____



How heavy was Alix when she was born? _____

How heavy was Rex when he was born? _____

Was there ever an age when Rex and Alix were the same weight? _____

Was there ever an age when Rex and Alix grew just as fast? _____

Tell what happened to Alix in the interval, $9 \leq \text{Age} \leq 12$ _____

Tell what happened to Rex in the interval, $9 \leq \text{Age} \leq 12$ _____