Graphing in the Primary Grades, Real Life Functions

Math Objectives:

- Examine rate of change
- Analyze and Interpret the graph of a function

Materials:

- TI-83/TI-84 Calculator
- CBR- Calculator-Based Ranger, (motion detector)

Standards:

2-SDAP 1.0Đ Students collect numerical data and record, organize, display, and interpret the data on bar graphs and other representations.

4-SDAP 1.0- Students organize, represent, and interpret numerical and categorical data and clearly communicate findings.

4-SDAP 1.3Đ Interpret one- and two-variable graphs to answer questions about a situation.

5- SDAP 1.2Đ Organize and display single-variable data in appropriate graphs and representations and explain which types of graphs are appropriate for various data sets.

6- AF 2.2Đ

Set up the CBR on a table in front of the classroom.

Tell the class that the CBR is a motion detector that graphs distance over time (a graph; with only x and y axis labeled, will be in the front board of the room). The teacher will walk in front of the motion detector and the calculator graphs that motion.

"I will be moving in front of the motion detector and you will predict what the graph looks like".

1) Walk away for 6 seconds
2) Stop for 4 seconds
3) Come back for 3 seconds
4) Stop for 3 seconds

"Draw your prediction of what

The graph will look like".

"Talk to your neighbor and

See if you got the same graph.

Why or why not?"

Ask for a few volunteers to draw their interpretation on the front board and ask the class for verification. Allow for some discussion. Ask for a volunteer to replicate the graph by moving in front of the motion detector. Allow for a trial and error.

Presentation of Purpose:

Bar graph display of data and bar graph interpretation starts in 2nd grade. By 4th grade students are asked to interpret one- and two- variable graphs to answer questions about a situation. By 7th grade students are asked to identify relationships on graphs that have one or more variables. Graphs are representations or a drawing from statistical data of the relationship between things.

For example line plots are used to see frequency of data items and display a visual comparison

problem can have lots of numbers, words and sentences or more than one graph. The student has to interpret the context, the questions, and the data. On a multiple choice item there can be four graphs with similar vertical and horizontal units but different slope one graph with a choice of different (and confusing) interpretations. The situations displayed by the graphs are also confusing. Usually students have no experience with items such as ÒAverage Traffic VolumeÓ, Òprice per dollar for Grand Prix Go CartsÓ, ÒWading PoolsÓ water levels, ÒAge of Students in a CPR classÓ, or ÒNumber of Common Dolphins: Santa Barbara Channel between 1995 and 2005Ó.

Giving students opportunities to experiment with graphs gives them some experience to understand the context of the given information. This activity increases studentÕs access to real life application of a graphical representation of distance over time.

Activity:

Instruction: Each group will have a motion detector. You will go outside and experiment with it. You will have 12 minutes to do the following:

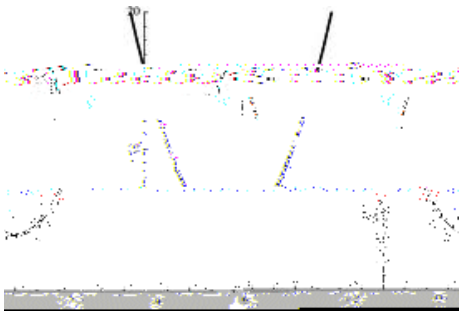
A) Form a parabola: concave up
B) Form a parabola: concave down
C)

Whole Group Activity: (return)

Choose a volunteer group to step to the front to demonstrate their movement. Ask the cl ass to predict the graph. Show the graph for verification. REPEAT one more time with different groups.

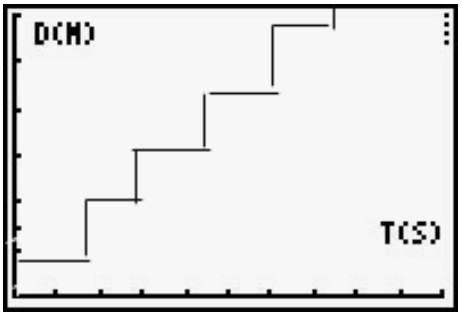
Show release items (If there is time)

*Parabola D concave up



*Parabola D concave down

**A step function is a piecewise function defined by a constant value over each part of its domain. Its graph resembles a series of stair steps. The constant values can increase with each step or decrease with each step.

. 

Explanation:

In the event of ERROR message on the 83 I follow the key instructions below to clear the error.

1) 2nd key
2) + key
3) 7 key
4) 2 key
5) 2 key

Eating a banana T-P-S

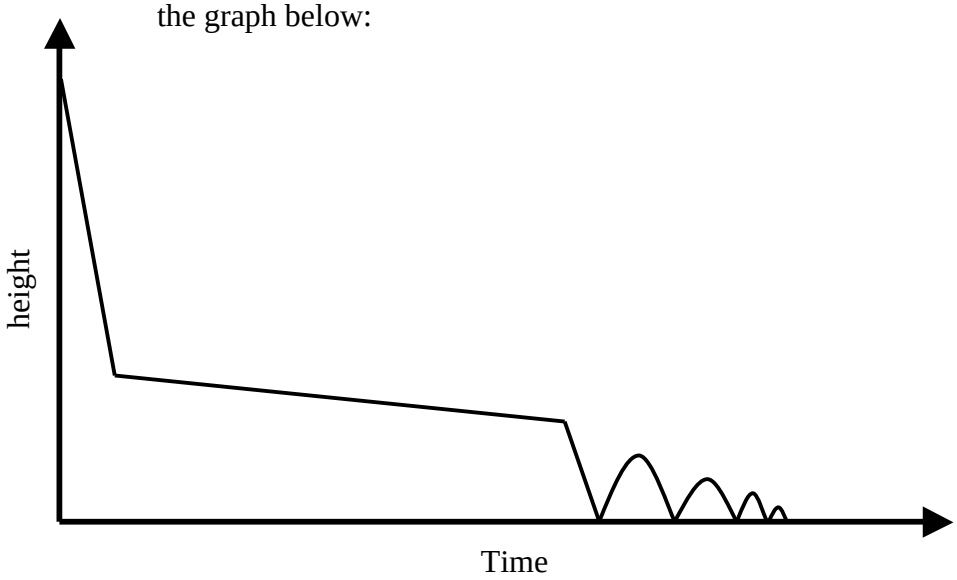
With your elbow partner d

Matching graphs to statements

The number of hits on a YouTube site, which was rising steadily at the beginning of the year, is now beginning to fall.	
The number of students that are absent has been falling steadily over the last year.	

The price of gasoline was falling rapidly but is now steady.

Discuss the graph with your elbow partner then write a story about a parachutist's fall based on the graph below:



Use the following sentence stems if needed:

I know that…because…

I agree because…

That makes sense because…

That is how I see it too because…

I don't think that is right since…

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