

# PHYSMATH

5: Interpreting graphs

## LEARNING OUTCOMES

### Level 4

- Draw the points on a line graph from a data table

### Level 5

- Interpret line graphs

### Level 6

- Predict the shape of a line graph

## PENDULUM EXPERIMENT (LAST LESSON)

- We're going to draw a line graph of our results
- This will show us whether there is a relationship between the length of the pendulum and the time it takes to swing



Use the scoring grid below to award a mark out of 8 for their line graph.

Criteria	Description	Check
What goes where?	The independent variable is along the x axis and the Dependent variable is up the Y axis	
Scales	The graph fills at least 2/3rds of the space available	
Scales	The scales are evenly spread along the axes	
Axes	The axes are clearly labelled	
Axes	The units are shown for each axis	
Title	The graph has an appropriate title that is underlined	
Points	All points are plotted accurately to within +/- 1mm and can be either a dot, circle or small cross	
Line of best fit	A single fine line of best fit has been drawn. This can be a straight line or a curve, depending on the spread of the results	

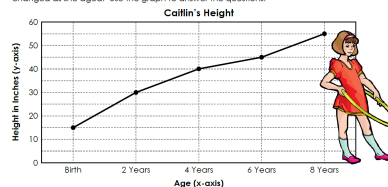
## GRAPH TIPS #1

- Make sure both axes are labelled with units
- Make sure the thing on the x axis is the thing you change
- Make sure the thing on the y axis is the thing you measure

## GRAPH TIPS #2

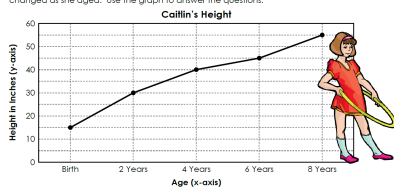
- Make sure the scale of your axis goes up in equal amounts
- Make sure your points are drawn really neatly with a sharp pencil
- Draw a line of best fit!

Caitlin's family has kept track of her height. Below is a line graph showing how her height has changed as she aged. Use the graph to answer the questions.



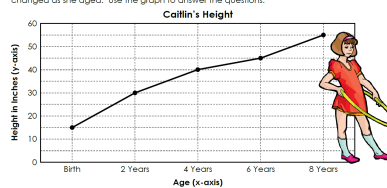
1. How tall was Caitlin when she was 4 years old?
2. How much had Caitlin grown from the time she was born to 6 years old?

Caitlin's family has kept track of her height. Below is a line graph showing how her height has changed as she aged. Use the graph to answer the questions.



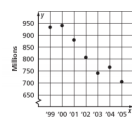
3. How old was Caitlin when she was 30 inches tall?
4. How tall might Caitlin be when she is 10 years old?
  - a. 85 inches
  - b. 55 inches
  - c. 50 inches
  - d. 65 inches

Caitlin's family has kept track of her height. Below is a line graph showing how her height has changed as she aged. Use the graph to answer the questions.



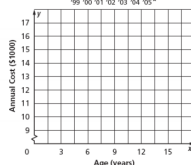
5. About how tall might Caitlin have been when she was 5 years old?
  - a. 40 inches
  - b. 43 inches
  - c. 45 inches
  - d. 49 inches

1. **MUSIC** The scatter plot shows the number of CDs (in millions) that were sold from 1999 to 2005. If the trend continued, about how many CDs were sold in 2006?



2. **FAMILY** The table below shows the predicted annual cost for a middle income family to raise a child from birth until adulthood. Draw a scatter plot and describe what relationship exists within the data.

Cost of Raising a Child Born in 2003					
Child's Age	3	6	9	12	15
Annual Cost (\$)	10,700	11,700	12,600	15,000	16,700



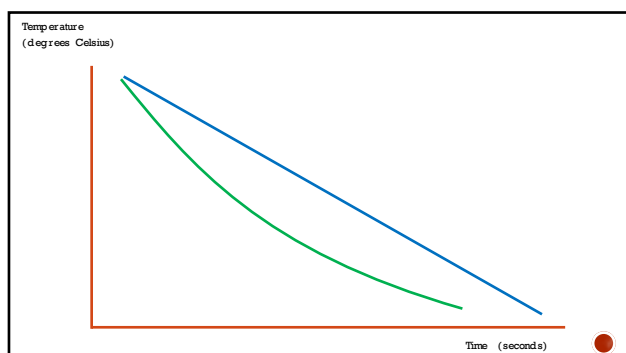
## PREDICTING THE SHAPE OF LINES GRAPHS

- Measuring the temperature of a cup of hot water over a period of time

Thing we  
measure  
(with unit)



Thing we  
change  
(with unit)



	Data pair (not necessarily in order)		Independent (x-axis)	Dependent (y-axis)
1	Temperature	Hours of heating	Hours of heating	Temperature
2	Stopping distance	Speed of a car	Speed of a car	Stopping distance
3	Number of people in a family	Cost per week for groceries		
4	Stream flow rate	Amount of rainfall		
5	Tree age	Average tree height		
6	Test score	Number of hours studying for a test		
7	Population of a city	Number of schools needed		

Sketch the graph you would expect for each of these data pairs

## YOUR TURN

- Come up with two variables (things that can change)
- Imagine you conducted an experiment to find out how they varied with one another
- What shape graph would you expect? Draw it.
- Look at your partner's graph – can you explain the shape of it?

## LEARNING OUTCOMES

- ✓ **Level 4**
  - Draw the points on a line graph from a data table
- ✓ **Level 5**
  - Interpret line graphs
- ✓ **Level 6**
  - Predict the shape of a line graph