

# Introduction to Non-linear Relationships



Does the following graph show a constant rate of change?

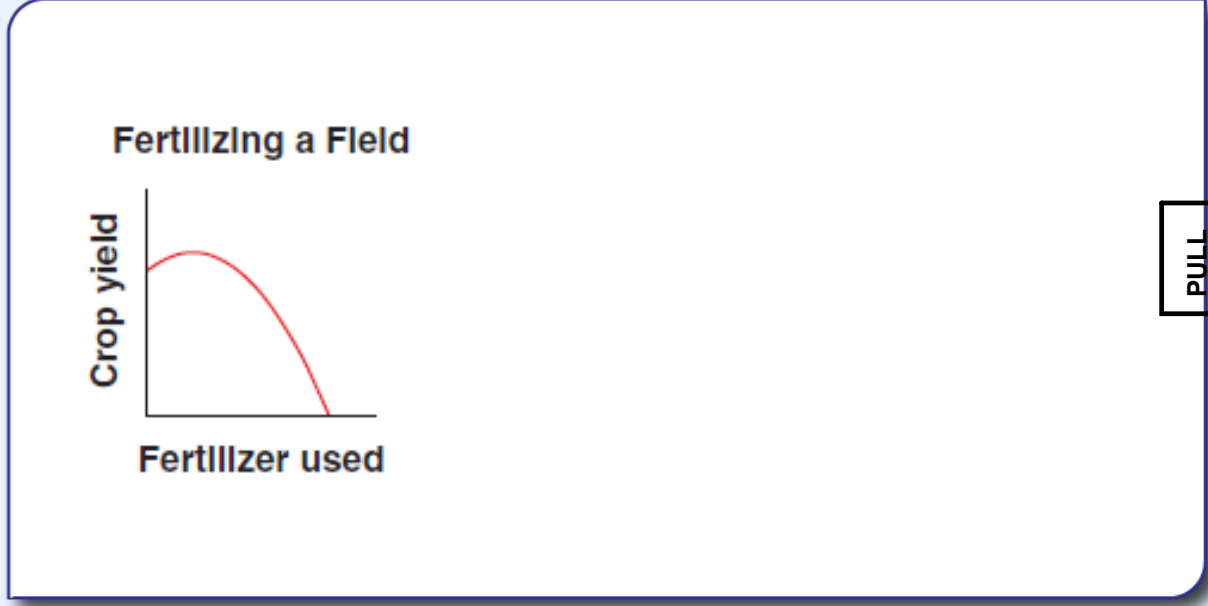
Yes or No

Jack's Babysitting Earnings



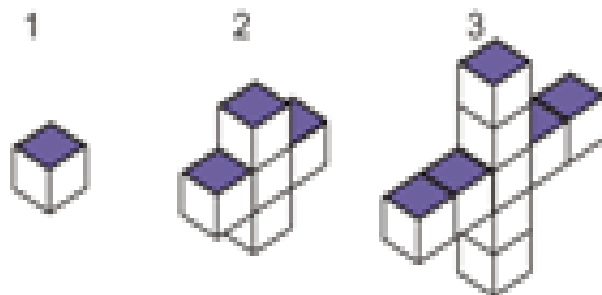
PULL

**2** Does the following graph show a constant rate of change? Yes or No



Complete the following table using the models provided.

Model Number	Number of Cubes
1	1
2	
3	
4	



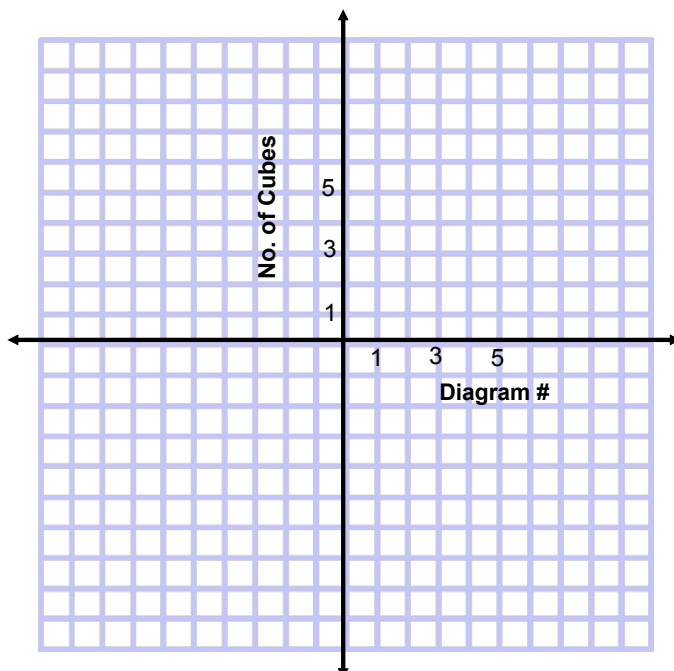
Let's analyze the data in this table for *patterns*.

	Model Number	Number of Cubes	
1st Diff. in x	1	1	1st Diff. in y
	2	5	
	3	9	
	4	13	



### One more step...together

Let's determine the graph for this relationship and come up with an equation that models it and the data from the table.

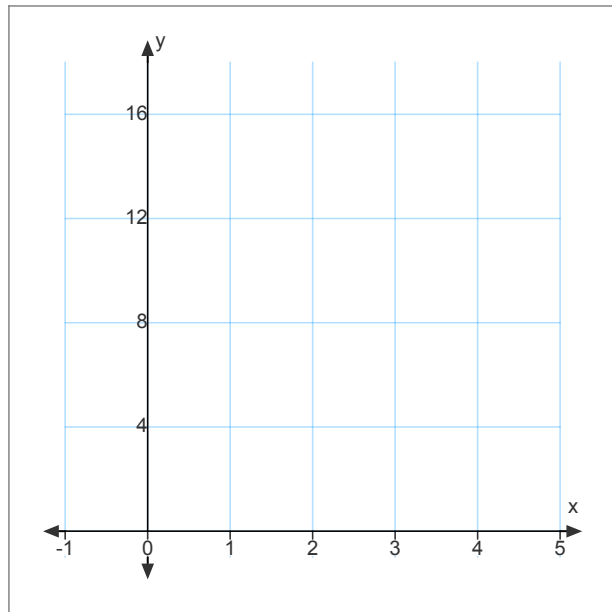


Equation:  $y = \underline{\hspace{1cm}}x + \underline{\hspace{1cm}}$



Non-linear Example

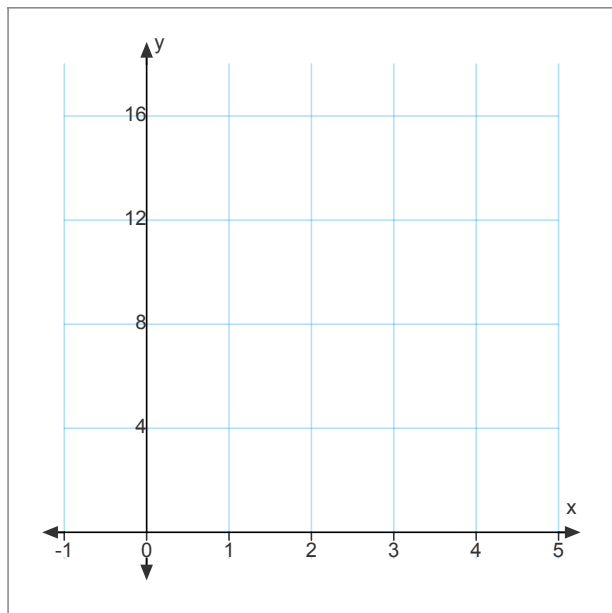
	X	Y	
1st Diff. in x	0	1	1st Diff. in y
	1	2	
	2	4	
	3	8	
	4	16	



The relationship is *non-linear* since ...

Non-linear Example

	X	Y	
1st Diff. in x	0	1	1st Diff. in y
	1	2	
	2	4	
	3	8	
	4	16	



The relationship is *non-linear* since ...



### Minds on Relationships: A Summary

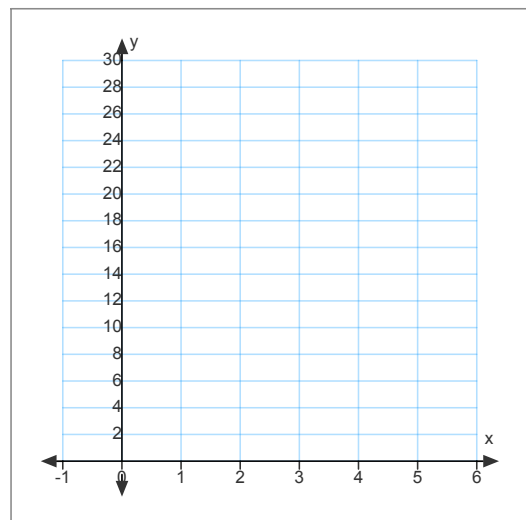
Complete the following to summarize our findings regarding **linear** and **non-linear** relationships.



Note: Buttons are linked to pages in the lesson file.

### A Special Type of Non-linear Relationship

	X	Y		
1st Diff. in x	1	1	1st Diff. in y	
1	2	4		2nd Diff. in y
1	3	9		
1	4	16		
1	5	25		

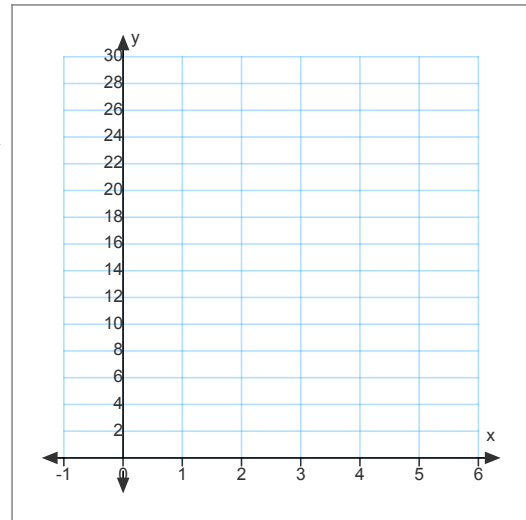


The relationship is *non-linear* since ...

It is also \_\_\_\_\_ since ...

### A Special Type of Non-linear Relationship

	X	Y		
1st Diff. in x			1st Diff. in y	
1	1	1		
1	2	4		2nd Diff. in y
1	3	9		
1	4	16		
1	5	25		



The relationship is *non-linear* since ...

It is also \_\_\_\_\_ since ...



### Exit Problem

Name: \_\_\_\_\_

Complete the following table of values and form a conclusion based on the differences in your table--i.e., Is the relationship between *Volume* and *Side Length* **linear**, **quadratic** or **other**? Explain your choice.

	Side length of Cube	Volume of Cube (units <sup>3</sup> )		
	0			
	1			
	2			
	3			
	4			

**Minds on Math: Talk-the-Talk**

Complete the following brainstorming chart to review what you know about linear and non-linear relationships.

**LINEAR**

Facts/Characteristics	
Example(s)	Non-example(s)

**NON-LINEAR**

Facts/Characteristics	
Example(s)	Non-example(s)

## Attachments

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Unit4-Models.doc