

# Exploring Relationships on a Grid

What each table needs:

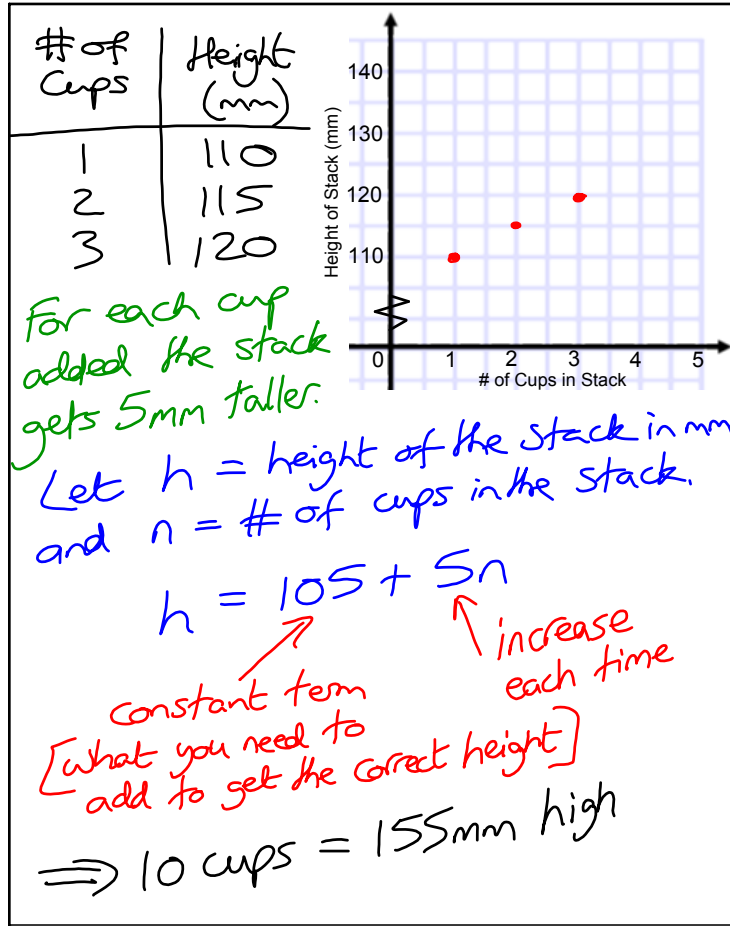
5 polystyrene cups, a ruler and grid paper

Nov 20-18:34

**How can you calculate the height of cups stacked inside each other?**

1. Work with a partner and make stacks of one, two, three, four, and five cups. Measure the height of each stack of cups. Record your measurements in a table. *Measure in mm*
2. Plot the points on a coordinate grid.
3. Describe the pattern of points. If the number of cups increases by one, by how much does the height of the stack increase?
4. Write a formula relating the height of the stack to the number of cups.
5. Use your formula to predict the height of a stack of 10 cups.
6. Make a stack of 10 cups and measure it. How accurate is your formula?
7. **Reflect** How did you develop a formula from your measurements?

Nov 27-16:07

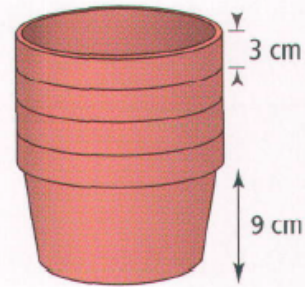


Dec 5-8:42 AM

**Example 1: Plot Points and Examine Relationships**

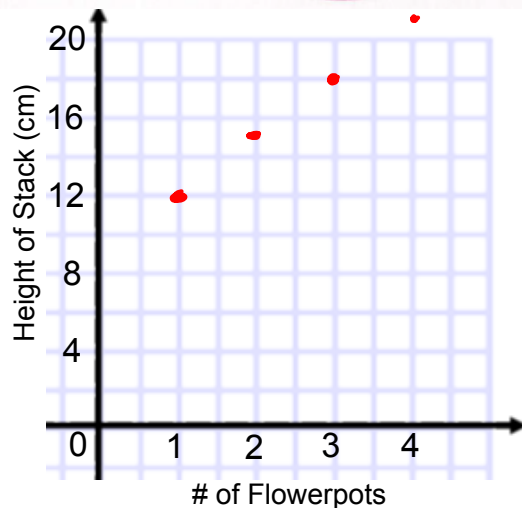
The height of a stack of flowerpots can be modelled with the formula  $h = 9 + 3n$ .

- a) Define the variables.
- b) Create a graph showing the heights of one to four flowerpots.
- c) Describe the pattern.



a)  $h$  = height of stack of flowerpots  
 $n$  = # of flowerpots

c) Each extra flowerpot increases the height by 3cm



Nov 27-16:09

**Example 2: Use Ordered Pairs to Understand Relationships**

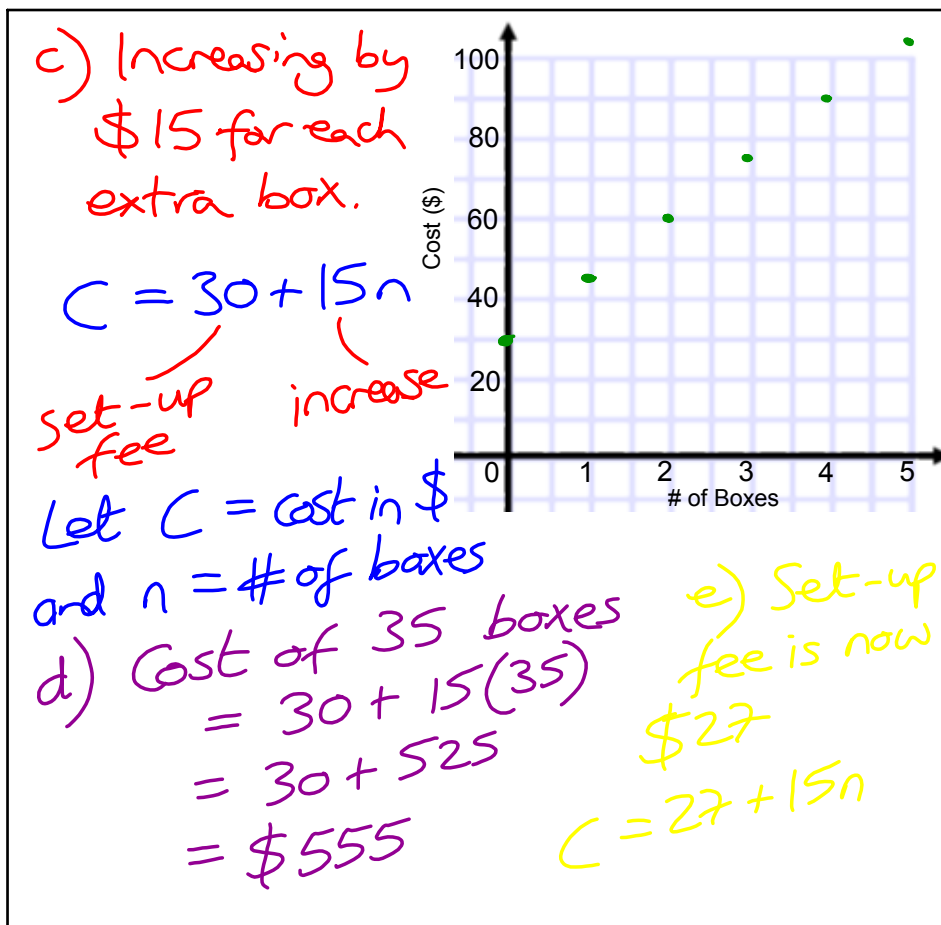
The student council is organizing a school play. The total cost to buy up to five boxes of tickets is shown. The set-up fee to design the tickets is \$30.

Number of Boxes, $n$	0	1	2	3	4	5
Total Cost, $C$ (\$)	30	45	60	75	90	105

- Write the ordered pairs. Then, plot the points on a grid.
- What does the ordered pair  $(0, 30)$  mean?
- Describe the pattern of points. Then, write an equation to model the relationship.
- How much will it cost for the student council to buy 35 boxes of tickets?
- If the set-up fee is reduced to \$27, how will your equation change?

a)  $(0, 30)$   $(1, 45)$   $(2, 60)$   
 $(3, 75)$   $(4, 90)$   $(5, 105)$

Nov 27-16:10



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## Copy the Key Ideas box

### Key Ideas

- To explore a relationship:
  - Investigate the ordered pairs.
  - Plot the points on a grid.
  - Describe the pattern of points.
- You can use an equation to make predictions.

(1, 12), (2, 14), (3, 16), (4, 18), ...

As the  $x$ -coordinate increases by one, the  $y$ -coordinate increases by two.

$h = 10 + 2n$ . By substituting  $n = 15$ , you can predict that a stack of 15 flowerpots will be 40 cm high.

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