Mental Maths

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ACMNA151

7 8 9 10 11 12

TI-Nspire | Investigation | Student | 50 min

Objective

Use a visual representation of the distributive law to improve mental computation strategies.

Equipment

For this activity you will need:

- TI-Nspire
- TI-Nspire file: "Mental Maths" (tns)

Instructions

Open the TI-Nspire file:

"Mental Maths"

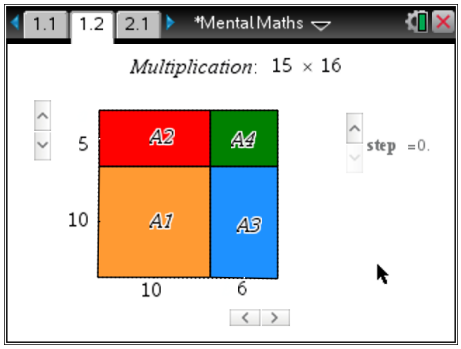
Navigate to page 1.2.

Make sure the sliders are set as follows:

a = 5

b = 6

step = 0



The overall shape is a rectangle; its area is equal to 15 x 16.

The rectangle is broken up into a square (A1: 10 x 10) and three smaller rectangles A2, A3 and A4.

Question: 1.

Change the **step** value to 1. Which shape is visible and what is its area?

Question: 2.

Change the step value to 2. Which shape is visible and what is its area?

Question: 3.

Change the step value to 3. Which shape is visible and what is its area?

Question: 4.

Change the step value to 4. Which shape is visible and what is its area?

Question: 5.

What is the total area: A1 + A2 + A3 + A4? Compare your result with 15 x 16.

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Question: 6.

Use the diagram on the calculator to help complete the following table:

Expression	A1	A2	A3	A4	Answer (total)
14 x 17	10 x 10 = 100			7 x 4 = 28	
13 x 15					
14 x 19					
16 x 18					
16 x 17					

Question: 7.

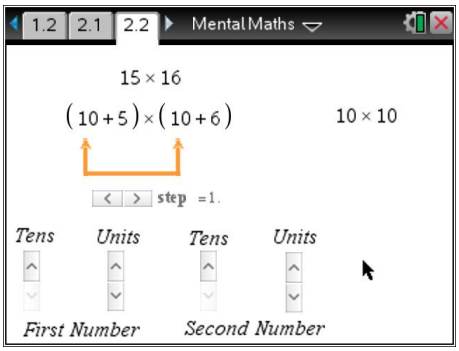
Use the diagram on the calculator to help complete the following table. Comment on any short-cuts for working with perfect squares.

Expression	A1	A2	A3	A4	Answer (total)
12 x 12					
13 x 13					
14 x 14					
15 x 15					
16 x 16					

A symbolic representation of the distributive law is included on Page 2.2. Two digit numbers are once again disassembled and considered as a combination of 'tens' and 'units'.

Navigate to page 2.2 and adjust the corresponding sliders to produce: 15 x 16

Adjust the 'step' to 0 and then proceed through each step to see how the distributive law works.



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Question: 8.

Use the interactive diagram for the distributive law to help complete the following table:

Expression	Step 1	Step 2	Step 3	Step 4	Answer (total)
13 x 15	10 x 10 = 100			3 x 5 = 15	
23 x 35					
34 x 52					
96 x 23					
82 x 31					

Question: 9.

Use the interactive diagram for the distributive law to help complete the following table. Comment on any short-cuts for working with perfect squares.

Expression	A1	A2	A3	A4	Answer (total)
42 x 42					
53 x 53					
61 x 61					
82 x 82					
76 x 76					

Question: 10.

Use traditional multiplication techniques to calculate 76 x 76 and compare the calculation **process** with the approach in question 9.

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