

My Problem-Solving Journal

Rich mathematical tasks for 21st century learners

Problem of the Week Challenge

WEEK 3

5th & 6th Class

Use the maths problem and
Teaching Notes below to set your
class a fun and engaging challenge
this week!

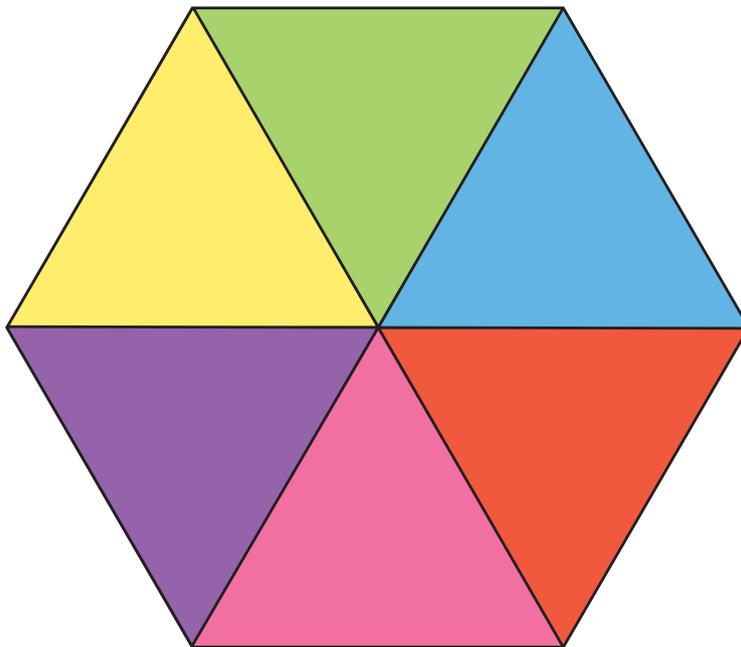
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5. Hidden in a Hexagon

Each of these numbers belongs in one of the segments of the hexagon.

9 8 16·4 6 4 12·3



Use these clues to match each segment to the correct number.

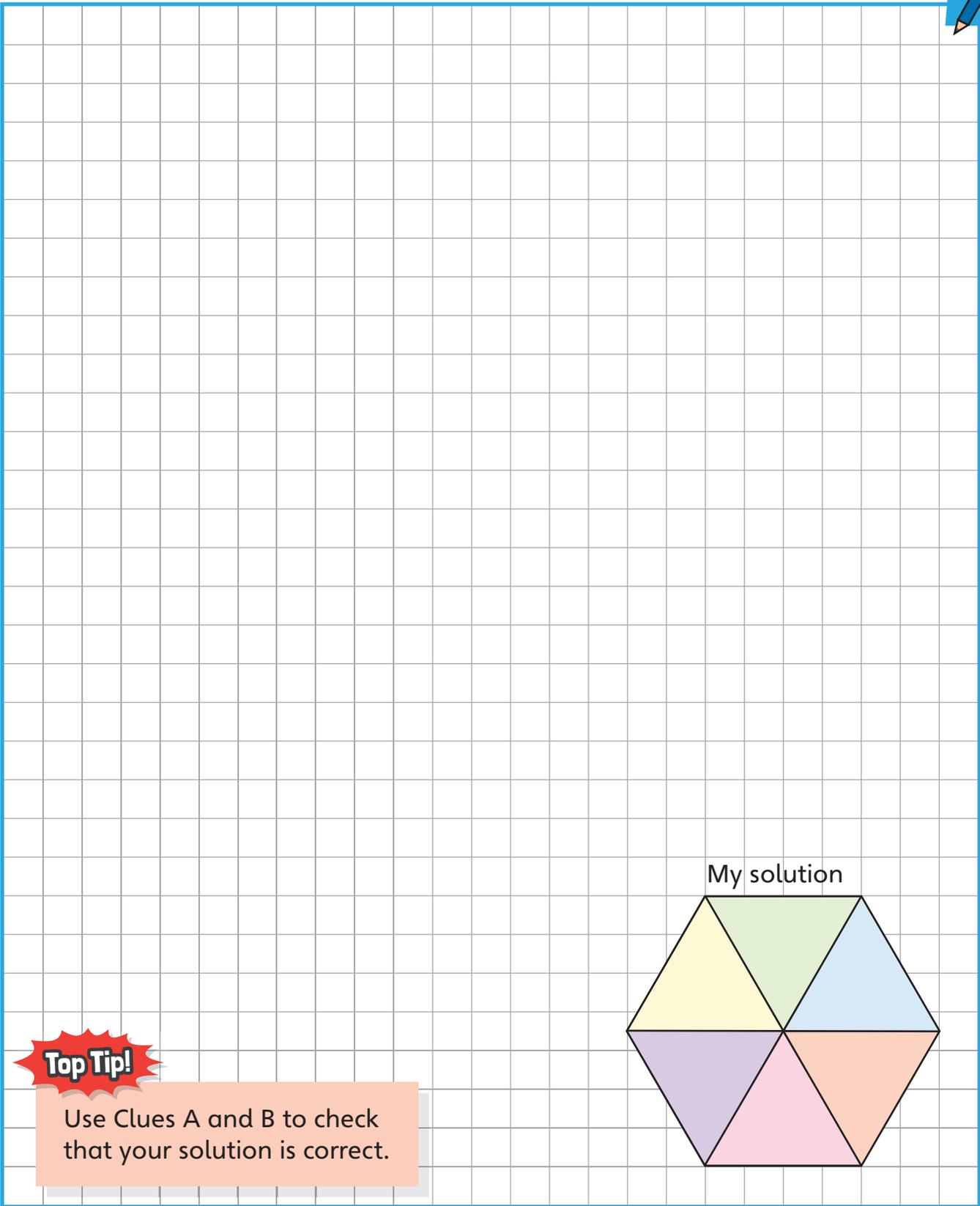
- A. The product of the numbers on the top half of the hexagon is $590\cdot4$
yellow \times green \times blue = $590\cdot4$
- B. The product of the numbers on the bottom half of the hexagon is also $590\cdot4$
purple \times pink \times red = $590\cdot4$
- C. The purple number is double the value of the blue number.
- D. The sum of the blue number and the red number is 10.
- E. The red number is $\frac{2}{3}$ of the value of the green number.

Top Tip!

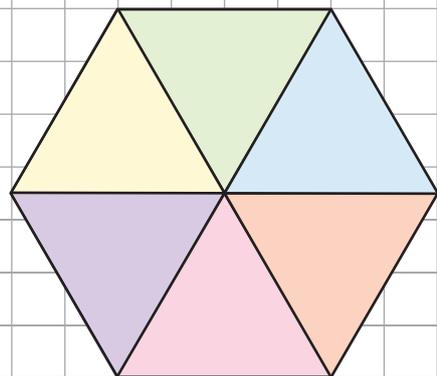
Read all the clues before you begin.

Maths Talk

Which clues did you use first? Why?



My solution



Top Tip!

Use Clues A and B to check that your solution is correct.

Extension

Find the product of green \times yellow \times purple.

Find the product of pink \times red \times blue.

Find the difference between the two products.

Number: Operations – Multiplication 2

5. Hidden in a Hexagon

This task presents a puzzle to be solved. It includes opportunities to multiply decimal numbers by whole numbers. The puzzle encourages students to read clues, analyse them and plan an approach to finding a solution.

Focus Skills:

- *Applying and problem-solving:* Analyse a problem and plan an approach to solving it.
- *Reasoning:* Reason systematically in a mathematical context.

Teaching Points:

- Ensure students understand the language used. E.g. ‘product’ is the result of multiplying numbers, ‘sum’ is the result of adding numbers and ‘difference’ is the result of subtracting one number from another.
- Encourage students to approach this task as they would a puzzle.
- The easiest clue to start with is not necessarily clue A. Encourage students to read all the clues before they begin, analyse them and decide which one is the most useful to use first.
- Following initial exploration time, some students may benefit from scaffolding. This may mean telling them to focus on clues C, D and E first.
- The multiplication element of the task can be solved using short or long multiplication. For example, if testing whether or not $12.3 \times 9 \times 8 = 590.4$, students can multiply by 9 and then by 8, or multiply by 72. Using both methods would be an interesting way for students to verify their work.

Anticipated Student Responses:

Task
<p>It is anticipated that students will begin with clues C, D and E to determine the positions of the whole numbers, and that they will then use trial-and-improvement (the ‘Try It’ strategy) to determine the positions of the remaining two numbers. However, while less efficient, students could begin with clues A and B and use trial-and-improvement to find possible solutions – then use clues C, D and E to check which solution is correct.</p> <p>C. As purple is double the value of blue, purple must be 8 and blue must be 4 as they are the only pair of numbers given in which one is double the other.</p> <p>D. As the sum of blue and red is 10, and we now know that blue is 4, red must be 6 as $4 + 6 = 10$.</p> <p>E. As red is $\frac{2}{3}$ the value of green, and we now know that red is 6, green must be 9 as $\frac{2}{3}$ of 9 = 6</p> <p>A. As $\text{yellow} \times \text{green} \times \text{blue} = 590.4$, and we now know that blue is 4 and green is 9, by trialling the two decimal numbers we can determine that yellow is 16.4:</p> $16.4 \times 9 \times 4 = 590.4$ $12.3 \times 9 \times 4 \neq 553.5$ <p>B. By process of elimination this means that pink must be 12.3. This can be verified using Clue B as we know that $\text{purple} \times \text{pink} \times \text{red} = 590.4$:</p> $8 \times 12.3 \times 6 = 590.4$ <p style="text-align: center;">yellow = 16.4 green = 9 blue = 4 purple = 8 pink = 12.3 red = 6</p>
Extension
<p>The extension activity encourages students to engage in further multiplication calculations:</p> $\text{green} \times \text{yellow} \times \text{purple} = 9 \times 16.4 \times 8 = 1180.8$ $\text{pink} \times \text{red} \times \text{blue} = 12.3 \times 6 \times 4 = 295.2$ $\text{difference: } 1180.8 - 295.2 = 885.6$