Stage 3
Problem Solving Work
C.U.B.E Introduction
'Solve me maybe' Song
The table below lists the original price and the amount of discount of the same shirt at four different shops.

<table>
<thead>
<tr>
<th>Shop</th>
<th>Original price</th>
<th>Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$20</td>
<td>25%</td>
</tr>
<tr>
<td>B</td>
<td>$24</td>
<td>$\frac{1}{3}$</td>
</tr>
<tr>
<td>C</td>
<td>$30</td>
<td>30%</td>
</tr>
<tr>
<td>D</td>
<td>$18</td>
<td>$2$ off</td>
</tr>
</tbody>
</table>

What is the lowest sale price for the shirt?
Tim wants to buy some clothes.

The table shows the prices of the items he wants to buy.

<table>
<thead>
<tr>
<th>Type of clothing</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polo shirt</td>
<td>$97.50</td>
</tr>
<tr>
<td>Blue jeans</td>
<td>$119.95</td>
</tr>
<tr>
<td>Socks</td>
<td>$12.95</td>
</tr>
<tr>
<td>Runners</td>
<td>$142.89</td>
</tr>
</tbody>
</table>

Tim estimates the cost of the clothes within a range.

Which of these gives the correct range for the cost of these clothes?

- $290 – $320
- $320 – $350
- $350 – $380
- $380 – $410
This tile has equal length sides.

3.5 cm

Four of the tiles joined together make a larger shape as shown.

What is the perimeter of the larger shape?

42 cm  49 cm  56 cm  70 cm
Lines $AB$ and $CD$ are parallel.

Line $PQ$ intersects lines $AB$ and $CD$ as shown.

Which pair of angles are equal?

- $\angle DGQ$ and $\angle DGP$
- $\angle CGP$ and $\angle AFQ$
- $\angle QGC$ and $\angle QGD$
- $\angle PGC$ and $\angle PFA$
This table shows the length and width of four rectangles in centimetres.

<table>
<thead>
<tr>
<th>Rectangle</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>20</td>
<td>12</td>
</tr>
</tbody>
</table>

Which rectangle has a perimeter of 32 centimetres?

- Rectangle A
- Rectangle B
- Rectangle C
- Rectangle D
A Cartesian plane is shown.

Select the correct statement below.

- O is located where $x = 0$ and $y < 0$.
- J is located where $x > 0$ and $y < 0$.
- K is located where $x < 0$ and $y > 0$.
- L is located where $x < 0$ and $y = 0$. 
The headboard on Alice’s bed is in the shape of a trapezium. To paint the headboard Alice needs to calculate the area.

What is the area of her headboard?

\[
\begin{align*}
\text{Area} &= \frac{1}{2} \times \text{height} \times (\text{base}_1 + \text{base}_2) \\
&= \frac{1}{2} \times 50 \times (20 + 100) \\
&= \frac{1}{2} \times 50 \times 120 \\
&= 3000 \text{ cm}^2
\end{align*}
\]

\[\boxed{3000} \text{ cm}^2\]
This year, Sam’s age is both a prime number and a factor of 57. In two years’ time, Sam’s age will be a prime number again. What is Sam’s age this year?
Gina is organising a sausage sizzle for her netball team.
She will buy the rolls in bags of a dozen.
She notices the more rolls she buys, the less it costs per bag.

<table>
<thead>
<tr>
<th>Number of bags</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$8.50</td>
</tr>
<tr>
<td>2</td>
<td>$16.50</td>
</tr>
<tr>
<td>3</td>
<td>$24.00</td>
</tr>
<tr>
<td>4</td>
<td>$31.00</td>
</tr>
<tr>
<td>5</td>
<td>$37.50</td>
</tr>
</tbody>
</table>

If this price pattern continues, how much will it cost for 7 bags of rolls?

$
What do I know?
What do I need to know?
What operation do I need to use?

- addition
- subtraction
- multiplication
- division

It may be helpful to eliminate the ones you know won't work!
Solve it...

- draw a picture
- write a number sentence
- estimate
- show all of my working

My answer is...
A roller-coaster has 6 cars.
Each car has 3 people in it.

How many people are on the roller-coaster altogether?

6  9  12  18
Henry uses the number sentence $12 \times 6 = 72$ to solve a problem. Which problem could he solve with this number sentence?

- Henry has 12 apples and gets 6 more. How many apples does he have now?
- Henry has 12 apples. He shares them with 6 friends. How many apples does each friend get?
- Henry has 12 friends. He buys 6 apples for each friend. How many apples does he buy?
- Henry has 12 apples and gives 6 away. How many apples does he have now?
Shana buys the items shown.

She gives the shop owner $30.

How much change should Shana get?

$6  $7  $24  $54
Ari thinks of a number.
He writes these clues so his friends can guess it.

- The number is less than 1000.
- The number has 90 tens.
- The digit in the ones place is the same as the digit in the hundreds place.

What is Ari's number?

- 90
- 99
- 900
- 909
Year 3

3. An adult fare on the train to Blue Town is $12 and a child fare is $6.

How much would it cost for a family of 2 adults and 2 children to travel to Blue Town?
6. This year Fay has saved $45 to buy a bike worth $395. Her Mum is going to give her $150 towards the bike. How much more does she need to save?
10. Sian and Peta both bought a T-shirt and hat. They each paid the same amount of money.

Sian’s T-shirt cost $32.90 and her hat cost $17.50
Peta’s T-shirt cost $27. How much did Peta’s hat cost?
19. A pea plant after 4 weeks is at its full height of 108 cm. At just two weeks the pea plant is 4 cm less than half its full height. How tall was the pea plant at two weeks?
Year 3

1a A man has to be at work by 9:00 a.m. and it takes him 15 minutes to get dressed, 20 minutes to eat and 35 minutes to walk to work. What is the latest time he can get up?
b. Our end of year school play had an audience of 786 on the first night and 889 on the second night. On the last night we sold 150 less than the second night. How many tickets are sold in 3 nights?
a. Terry bought a saw for $92. He also bought a wrench for $18.90. He used $50 from his wallet and the rest he got from his wife’s purse. How much did he take from his wife’s purse?
b. 4 walls in a bedroom are to be painted. A can of paint costs $24.50 and covers 10 m². How much will it cost for paint if each wall is 3 m wide and 2 m high?
3 pieces of rope, all 4.5 m long are tied together. Each knot takes up 0.4 m of rope. How long is the piece of rope when it is all joined together?
Sydney paid $21 for presents.
For presents A and B he paid $17
For presents B and C he paid $12
For presents A and C he paid $13
How much did Sydney pay for Presents A, B and C?
There are 56 sheep in a paddock.
Each sheep is either white or black.
There are 6 times as many white sheep as there are black sheep.
How many **black** sheep are in the paddock?
29. Arav went for a run and stopped after \( \frac{1}{4} \) kilometre.
Which of these shows Arav at the point where he stopped running?
Cilla has 35 twenty-cent coins in her purse.

How much money does she have altogether?

$70  $35.20  $35  $7
Amber is keeping silkworms.

She records the number of leaves they have eaten every five days.

<table>
<thead>
<tr>
<th>5 days</th>
<th>10 days</th>
<th>15 days</th>
<th>20 days</th>
<th>25 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>15</td>
<td>45</td>
<td>135</td>
<td>?</td>
</tr>
</tbody>
</table>

If this pattern continues, how many leaves will the silkworms have eaten in 25 days?
The athletics carnival started at 10:30 am and lasted for $2 \frac{1}{4}$ hours.
Rose went straight home after the carnival finished.
She took $\frac{1}{2}$ an hour to get home.
What time did Rose get home?

- 12:45 pm
- 1:00 am
- 1:00 pm
- 1:15 am
- 1:15 pm
Twelve friends are planning a day trip to an aquarium.

- Food costs $11 per person.
- Tickets cost $15 per person.
- A boat costs $450 for the whole group.

What is the total cost of the trip for the whole group?

$
The table shows the fixtures for six football teams on Saturday.

<table>
<thead>
<tr>
<th>Start time</th>
<th>Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Team A plays Team B</td>
</tr>
<tr>
<td>10:00</td>
<td>Team C plays Team D</td>
</tr>
<tr>
<td>11:00</td>
<td>Team E plays Team F</td>
</tr>
</tbody>
</table>

If no match ends in a draw, which of the following is possible?

- Teams A and F both win.
- Teams C and D both lose.
- Teams A, D, E and F all win.
- Teams B and C are the only teams that lose.
Pippa had 35 stickers.

She gave an equal number of stickers to 8 friends.

She gave each friend as many stickers as possible and kept the rest for herself.

How many stickers did Pippa keep for herself?

3  4  11  27
Anna opens a savings account. She deposits $4 in the first week. She then deposits twice as much money each week as she did the previous week. The total amount of money in the account is

- always odd.
- always even.
- sometimes odd and sometimes even.
William earns money each week for doing jobs.
For each job he earns $2.
He records the number of jobs he does in one week in a table.

<table>
<thead>
<tr>
<th>Jobs</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take out the rubbish</td>
<td></td>
</tr>
<tr>
<td>Walk the dog</td>
<td></td>
</tr>
<tr>
<td>Wash dishes</td>
<td></td>
</tr>
</tbody>
</table>

If William does the same jobs for three weeks, how much money will he earn altogether?

$13
$26
$39
$78
The regular price of a shirt is $24.50.
The shirt is on sale for 10% off the regular price.
What is the sale price of the shirt?

$