Good afternoon, little monsters.

Let’s begin today’s lesson with a problem.

I have placed a total of 51 capsules in these two mugs.

The second mug contains 7 more capsules than the first.

How many capsules are there in each mug?

Isn’t there a way we can use a variable to solve this problem?

Indeed! Suppose we use $c$ to represent the number of capsules in the first mug.

<table>
<thead>
<tr>
<th>1st Mug</th>
<th>2nd Mug</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>11</td>
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<td>3</td>
<td>10</td>
<td>13</td>
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<td>4</td>
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<td>6</td>
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<td>8</td>
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<td>23</td>
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<td>9</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>18</td>
<td>29</td>
</tr>
</tbody>
</table>
The second mug has 7 more capsules than the first.

So, if there are $c$ capsules in the first mug...
...then there are $c+7$ capsules in the second mug!

The second mug has 7 more capsules than the first.

So, $c$...
...plus $c+7$...
...equals 51!

There are a total of 51 capsules in both mugs.

$c + (c + 7) = 51$

Extraordinary!

We can erase the parentheses, since it’s all addition.

$c + c + 7 = 51$

THE ASSOCIATIVE PROPERTY OF ADDITION LETS US MOVE OR REMOVE PARENTHESES IN A SUM.

If we subtract 7 from both sides of the equation, we get $c + c = 44$.

$c + c + 7 = 51$

If two $c$’s add up to 44, then $c$ must be half of 44.

$c + c = 44$

-7 -7

$c + c = 44$
It's always a good idea to check your answer!

Wait, what does that mean?

We used $c$ to represent the number of capsules in the first mug...

...and $c+7$ to represent the number of capsules in the second mug.

Since $c=22$, there are 22 capsules in the first mug...

...and $22+7=29$ capsules in the second mug.

Got it. And since $22+29=51$, our answer checks out.

There are 51 capsules all together.

Wait! Grogg, don’t mix those!