



Maths

Addition, Subtraction,
Multiplication and Division

Common Factors, Common Multiples and Prime Numbers Reasoning

Aim

- I can solve reasoning questions using my knowledge of common factors, common multiples and prime numbers.

Success Criteria

- I know what the term 'common factor' means.
- I know what the term 'common multiple' means.
- I know what the term 'prime number' means.
- I can use mathematical language to explain solutions to problems.

Common Factors Reasoning 1a

What is a common factor?

| Factors of 15 | Factors of 30 |
|---------------|---------------------------|
| 1, 3, 5, 15 | 1, 2, 3, 5, 6, 10, 15, 30 |

The common factors of 15 and 30 are 1, 3, 5 and 15.

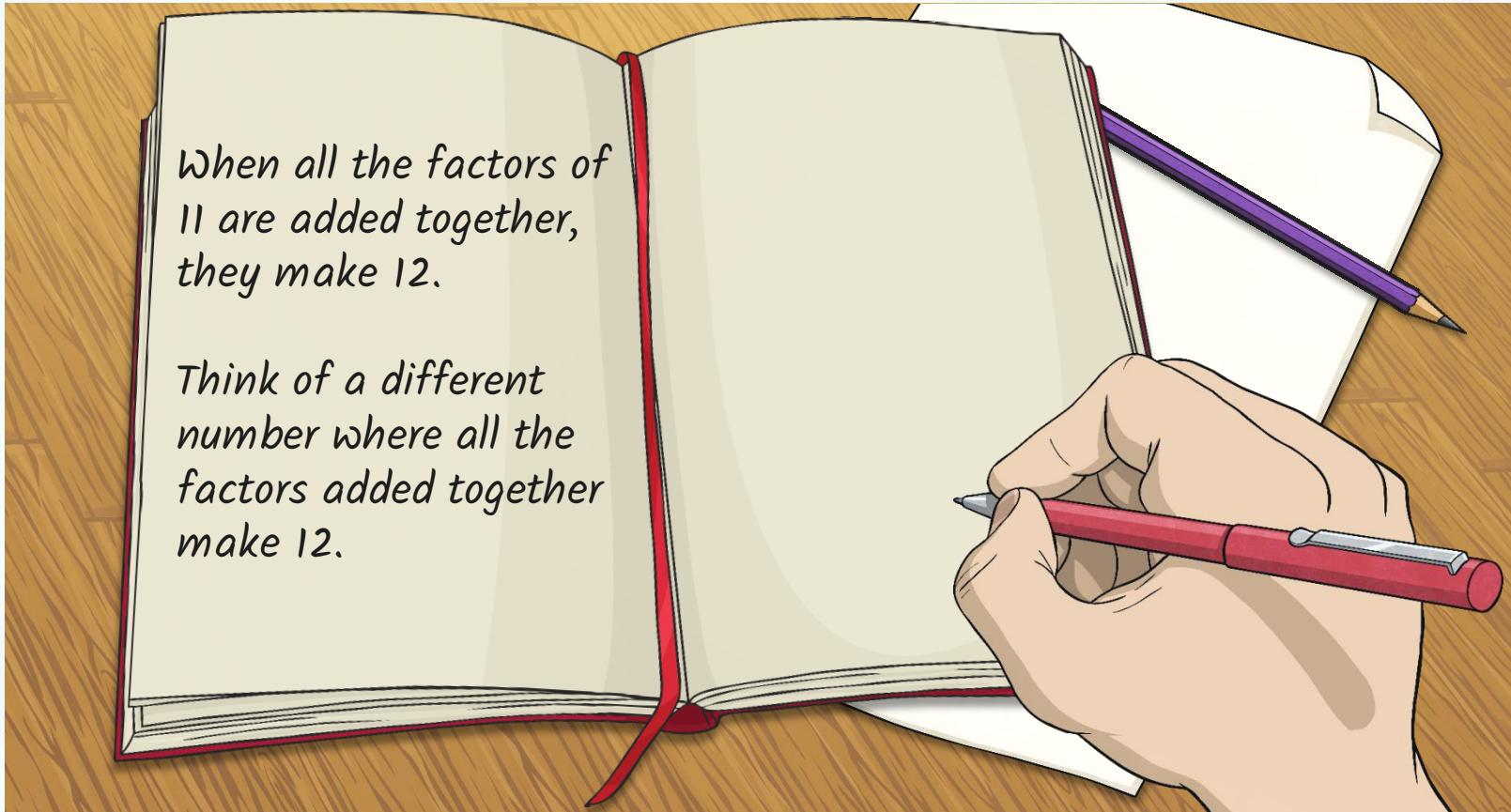
Then we look at the factors that each number shares.

Common Factors Reasoning 1a

Read this reasoning question carefully.

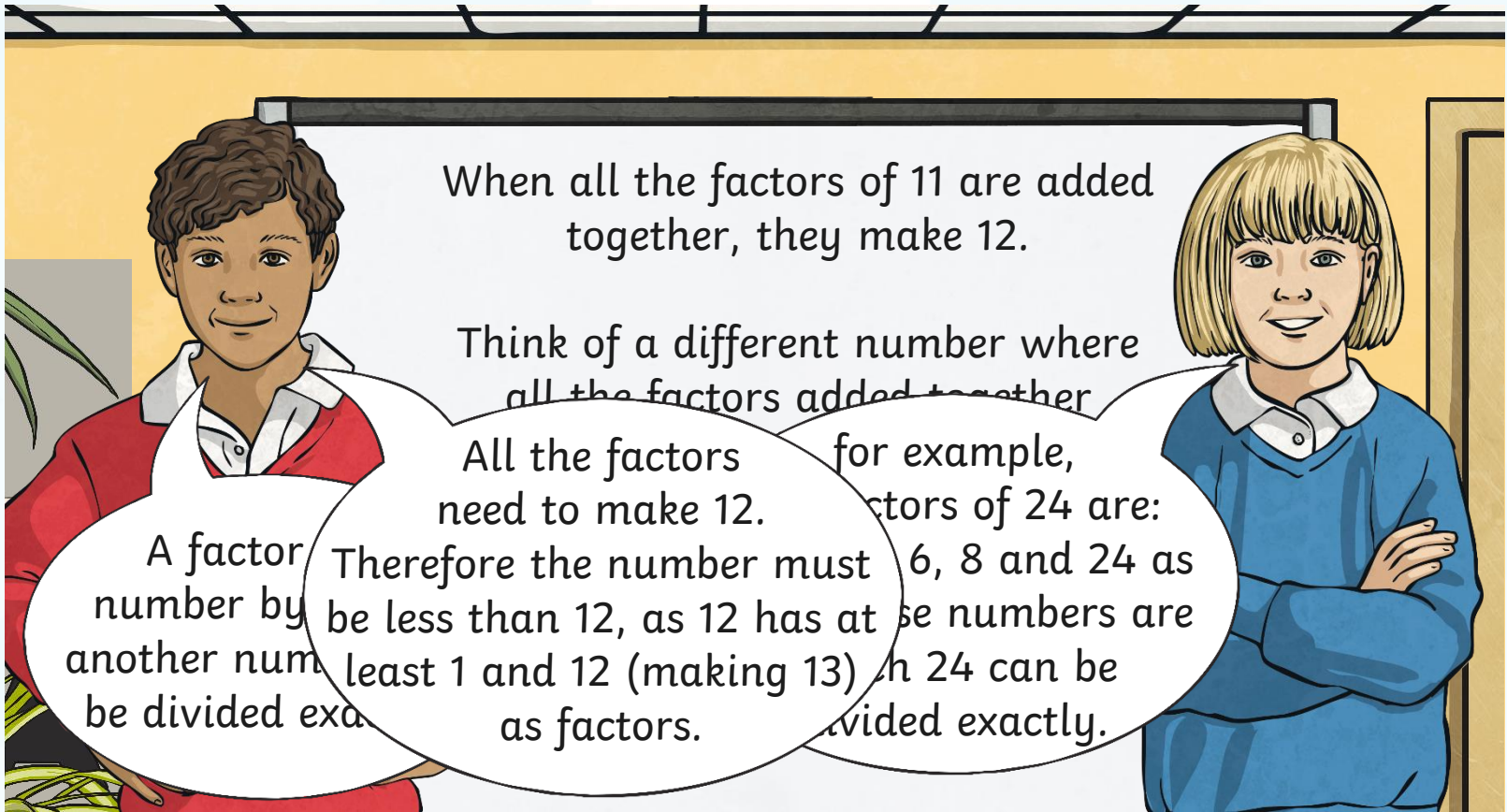
When all the factors of 11 are added together, they make 12.

Think of a different number where all the factors added together make 12.



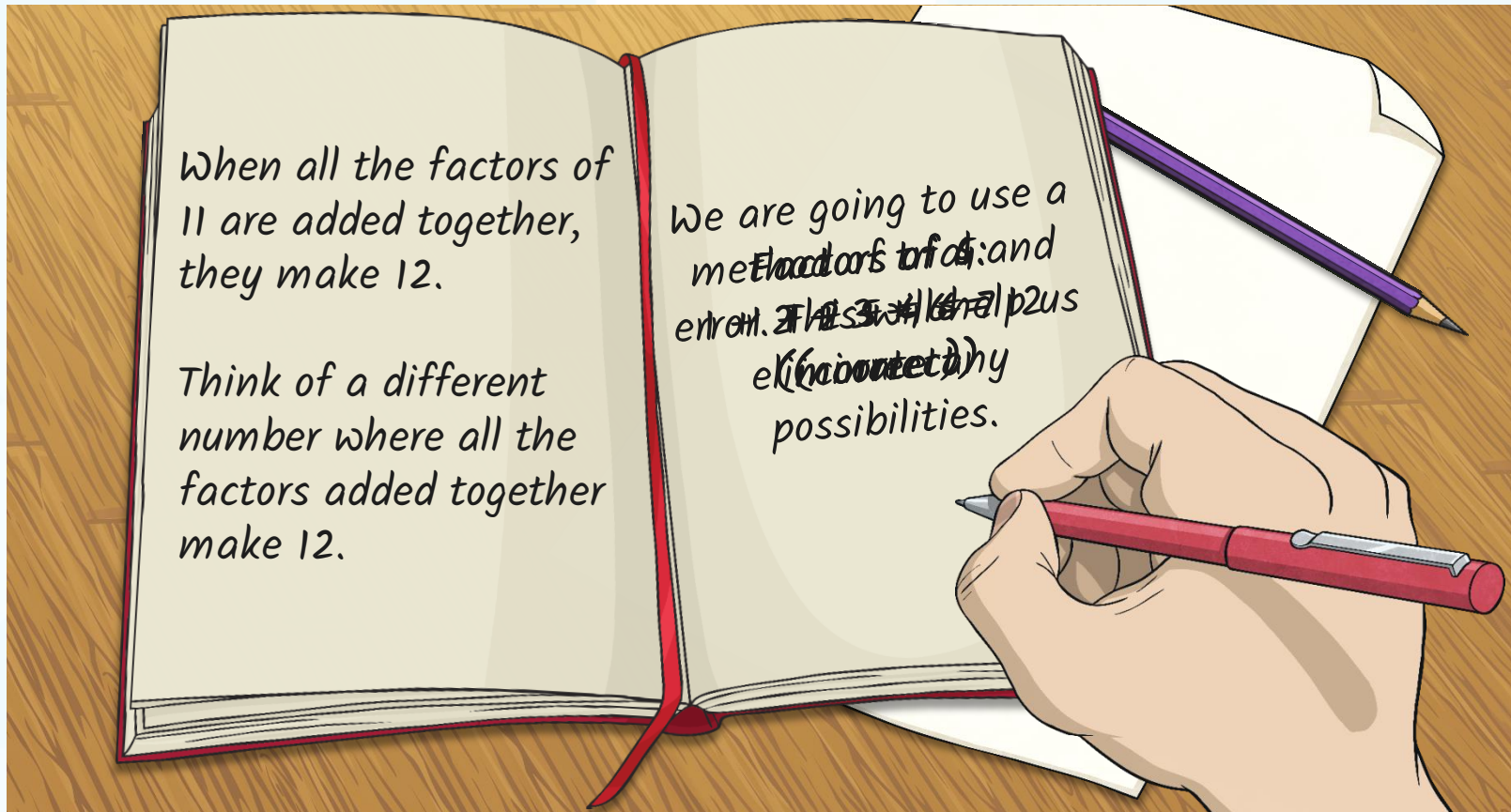
Common Factors Reasoning 1a

Next, let's think about what we already know in order to help us answer the question correctly.



Common Factors Reasoning 1a

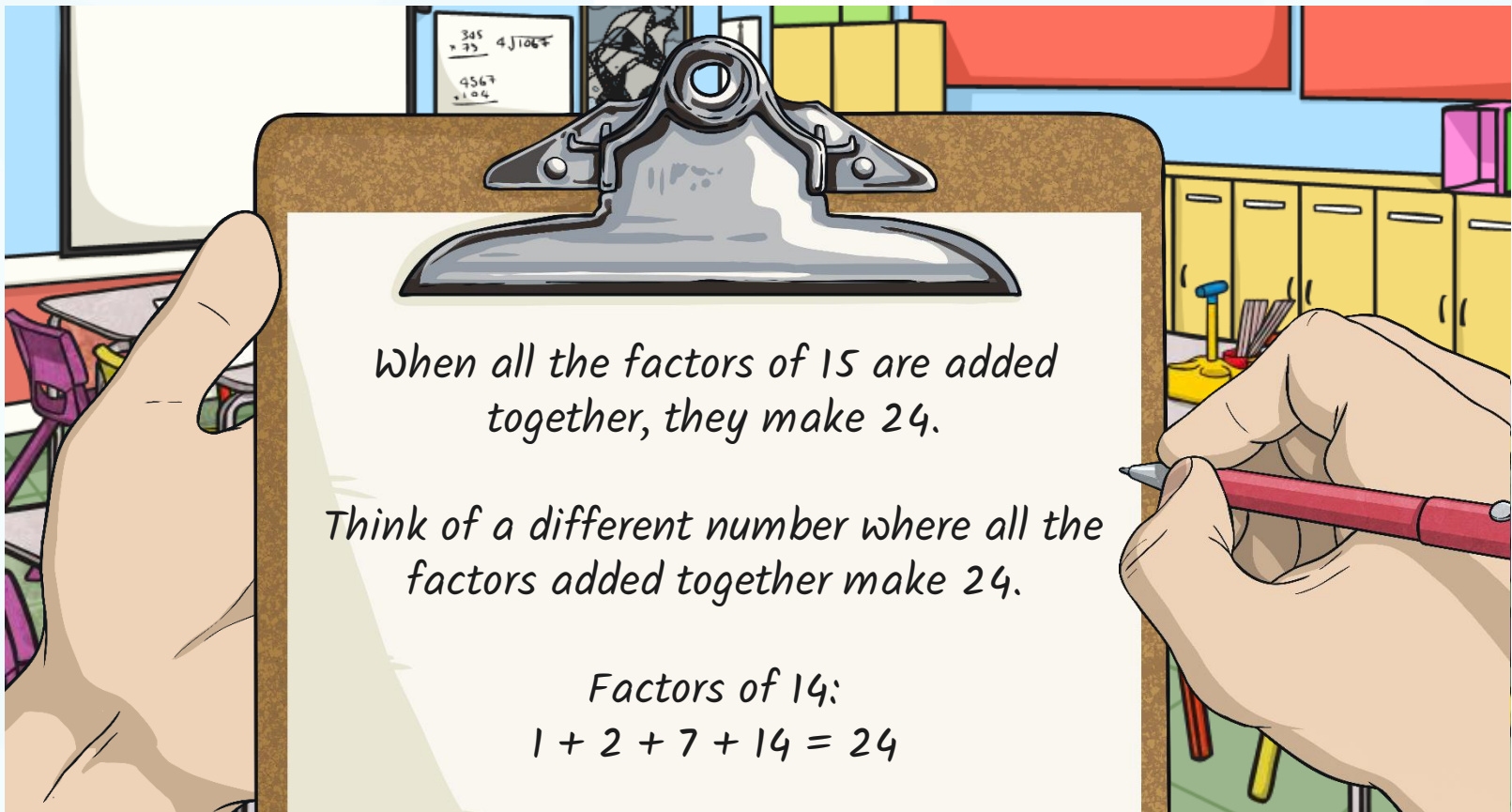
Now we are ready to apply the check our work to solve the problem.



Common Factors Reasoning 1b

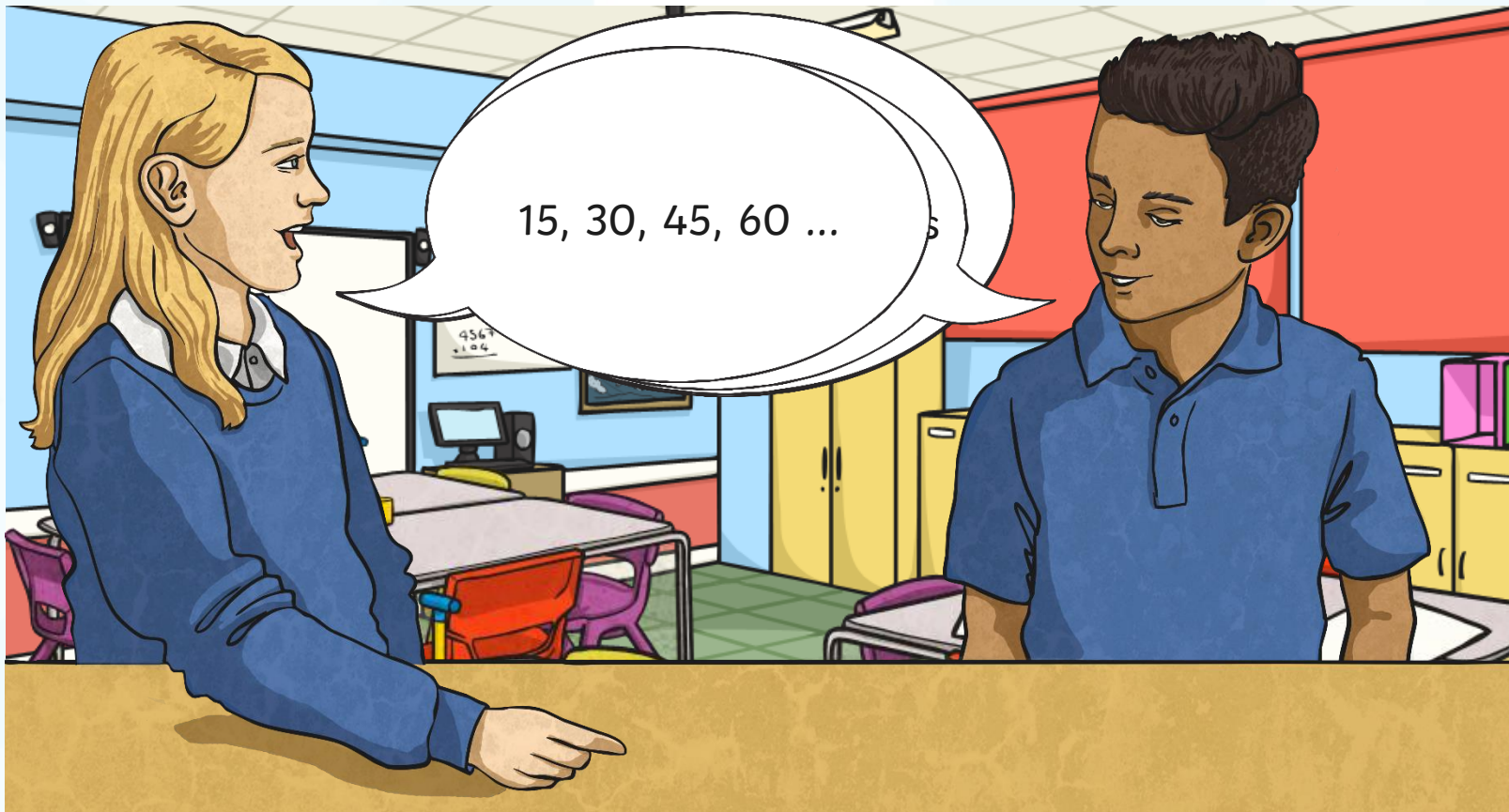
Working with a partner, use your reasoning skills to solve the first question on your Talk Partner Activity Sheet.

Answers



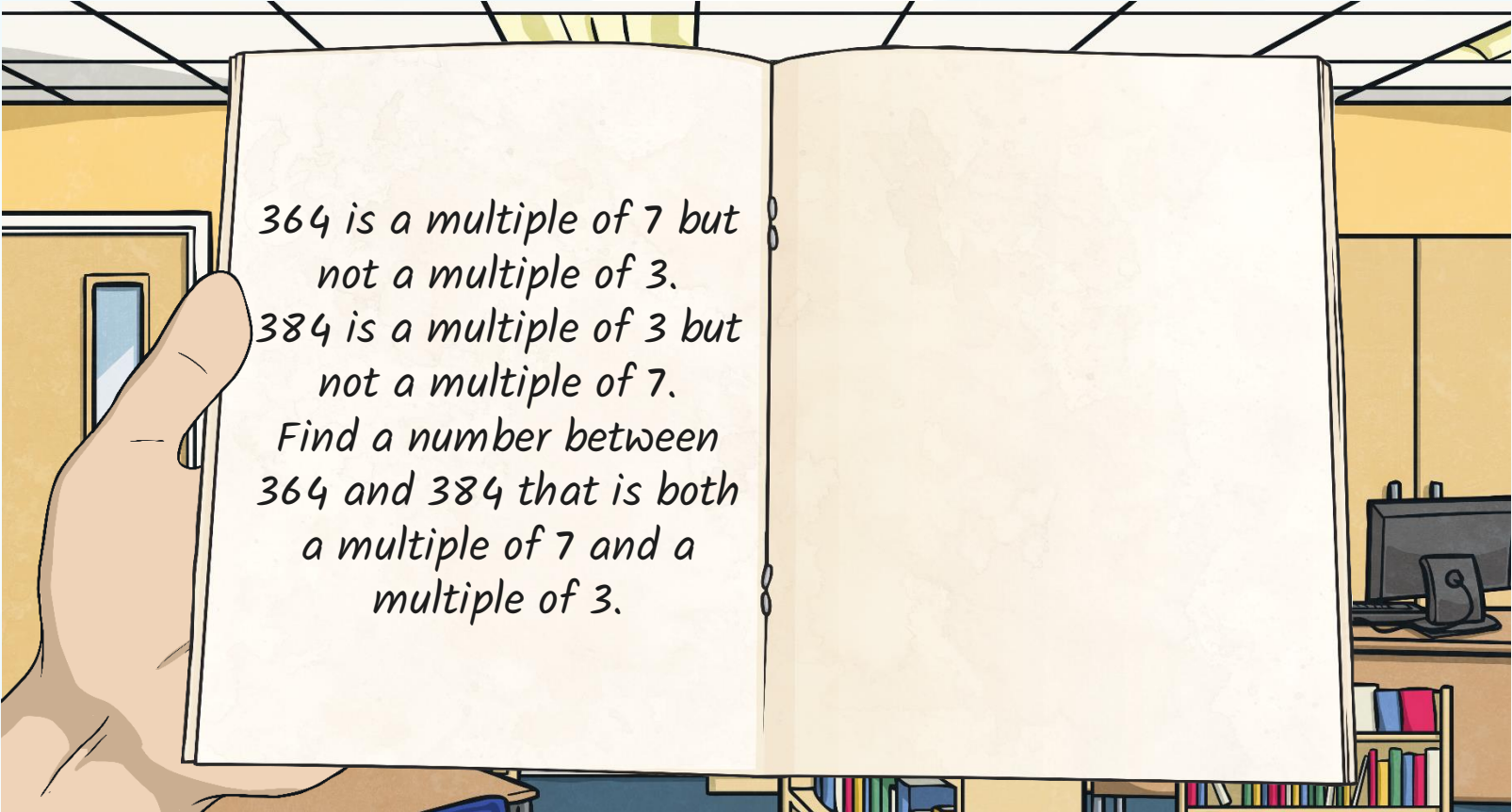
Common Multiples Reasoning 2a

What does the term 'multiple' mean?



Common Multiples Reasoning 2a

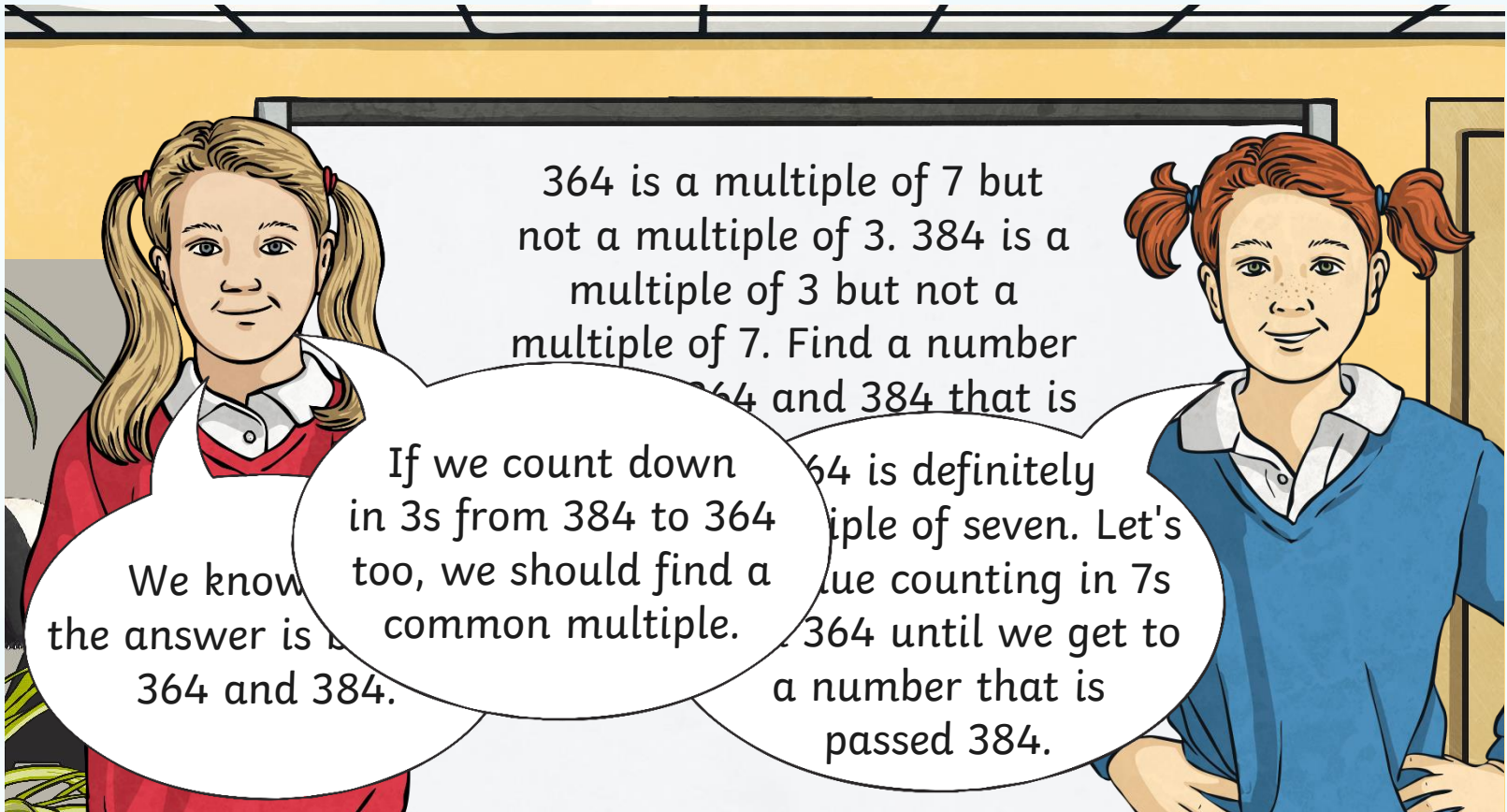
Read this reasoning question carefully.



*364 is a multiple of 7 but
not a multiple of 3.
384 is a multiple of 3 but
not a multiple of 7.
Find a number between
364 and 384 that is both
a multiple of 7 and a
multiple of 3.*

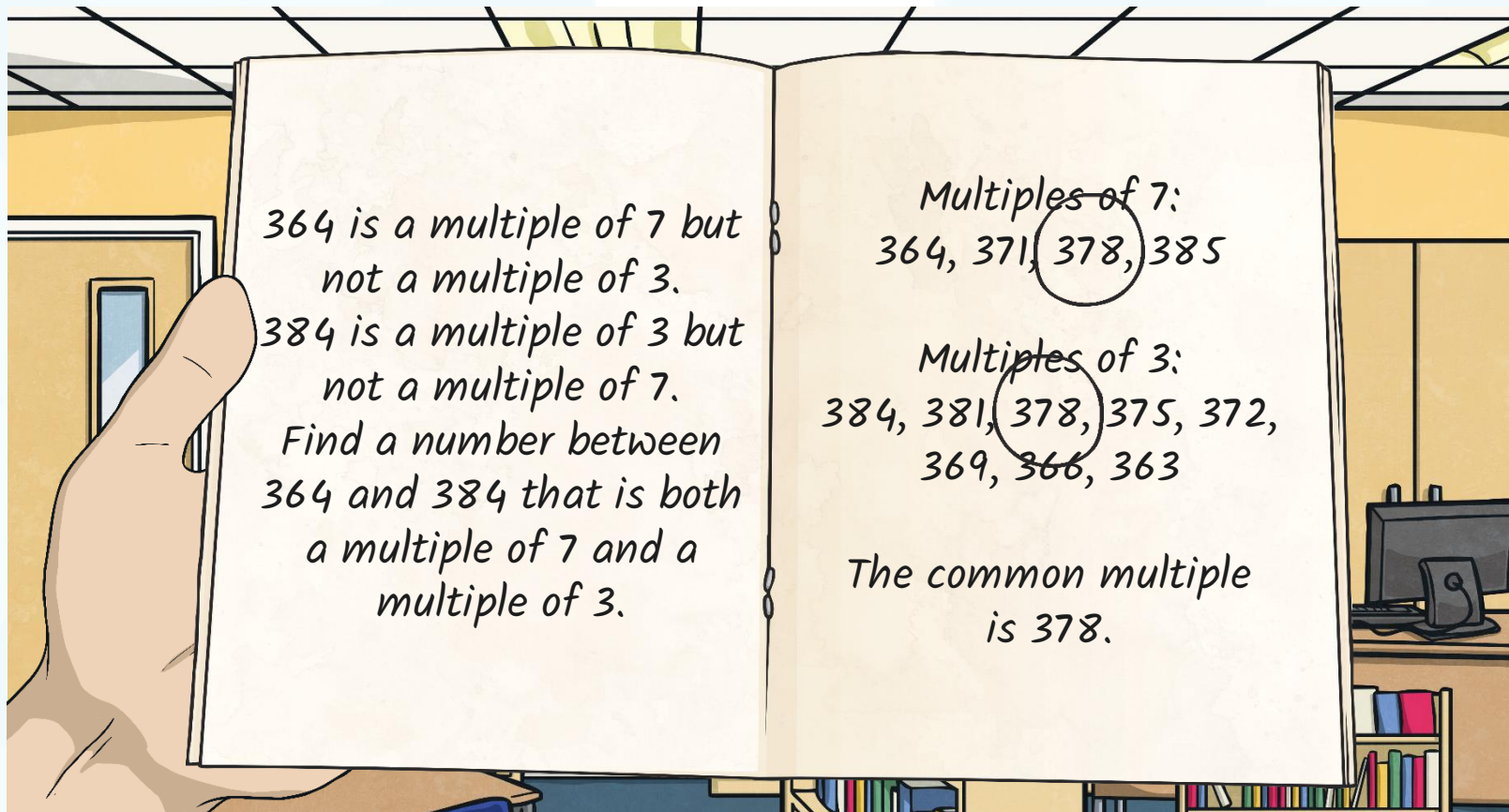
Common Multiples Reasoning 2a

Next, let's think about what we already know in order to help us answer the question correctly.



Common Multiples Reasoning 2a

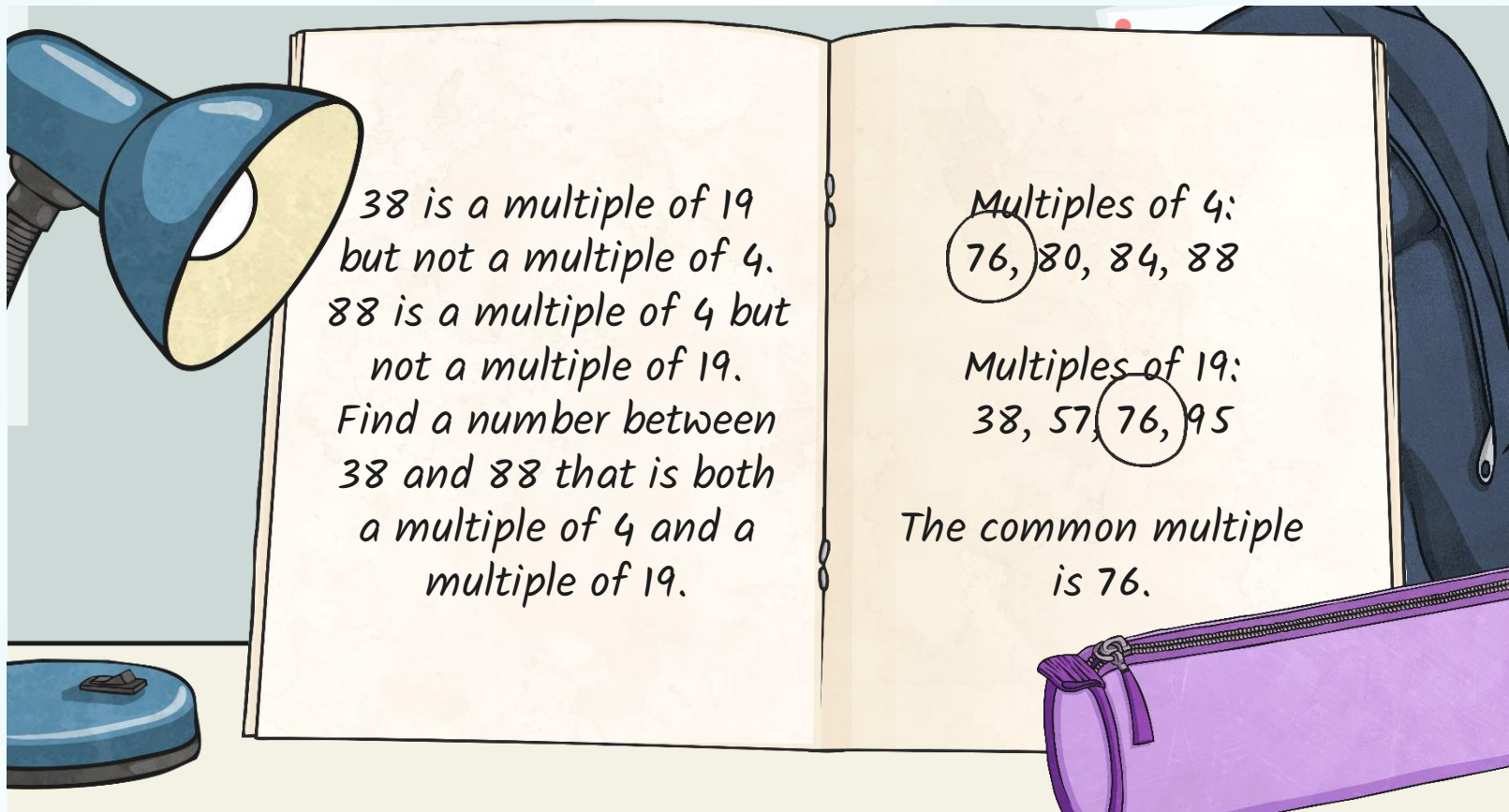
Finally, let's check our answer to make sure we have answered the question fully.
Now we are ready to apply our learning to solve the problem.



Common Multiples Reasoning 2b

Working with a partner, use your reasoning skills to solve the second question on your Talk Partner Activity Sheet.

Answers



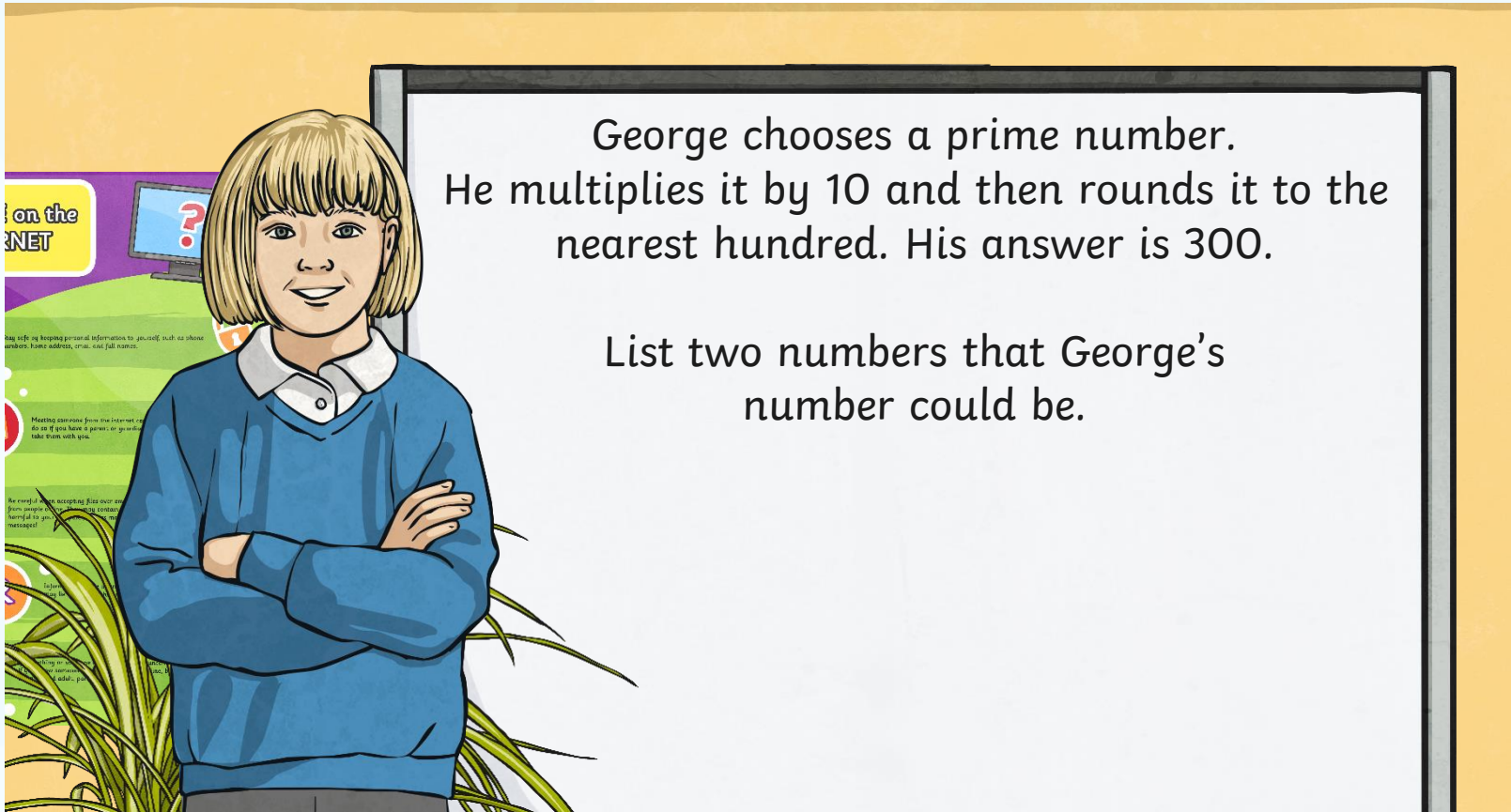
Prime Numbers Reasoning 3a

What does the term 'prime number' mean?



Prime Numbers Reasoning 3a

Read this reasoning question carefully.

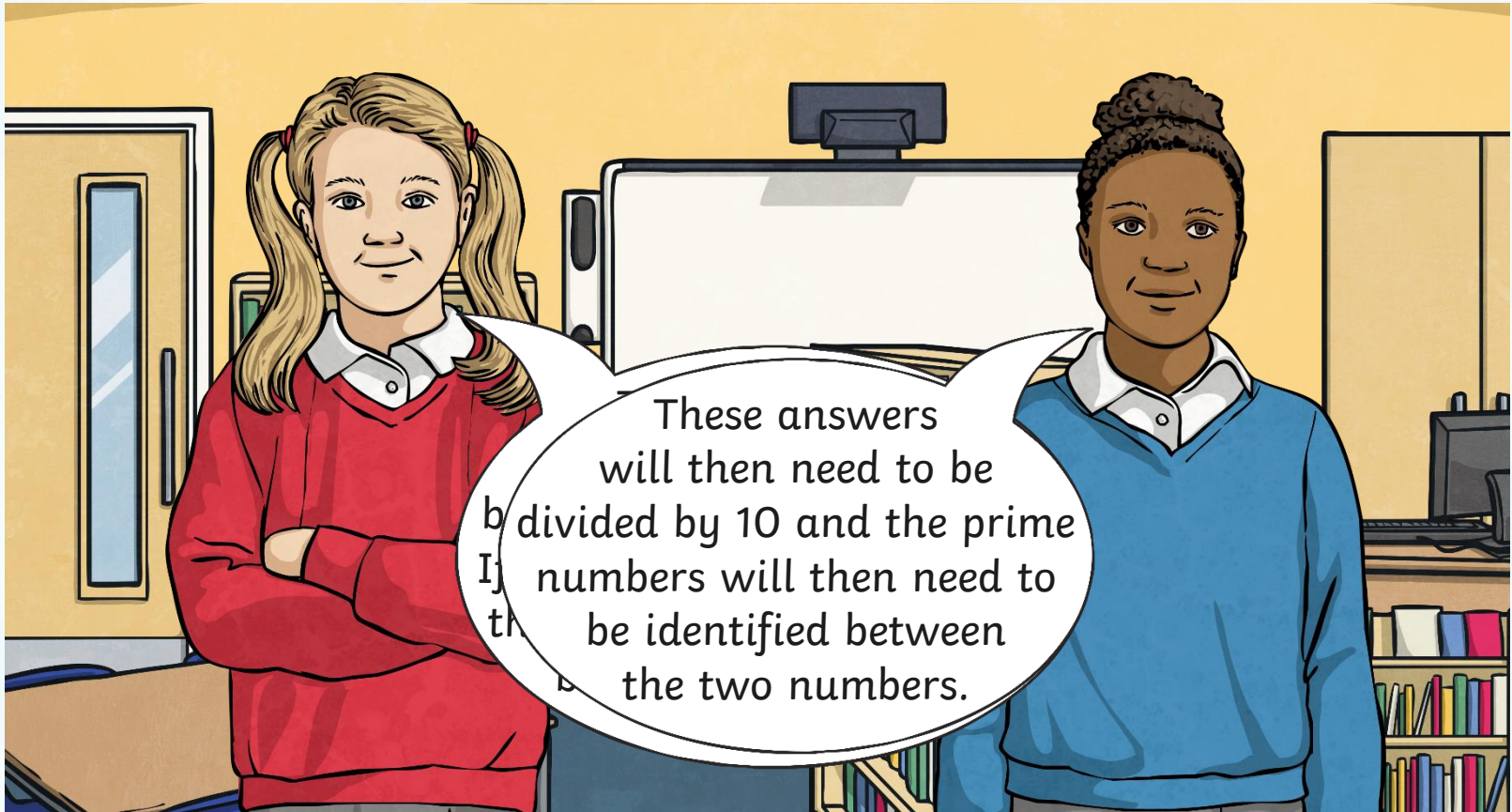


George chooses a prime number.
He multiplies it by 10 and then rounds it to the nearest hundred. His answer is 300.

List two numbers that George's number could be.

Prime Numbers Reasoning 3a

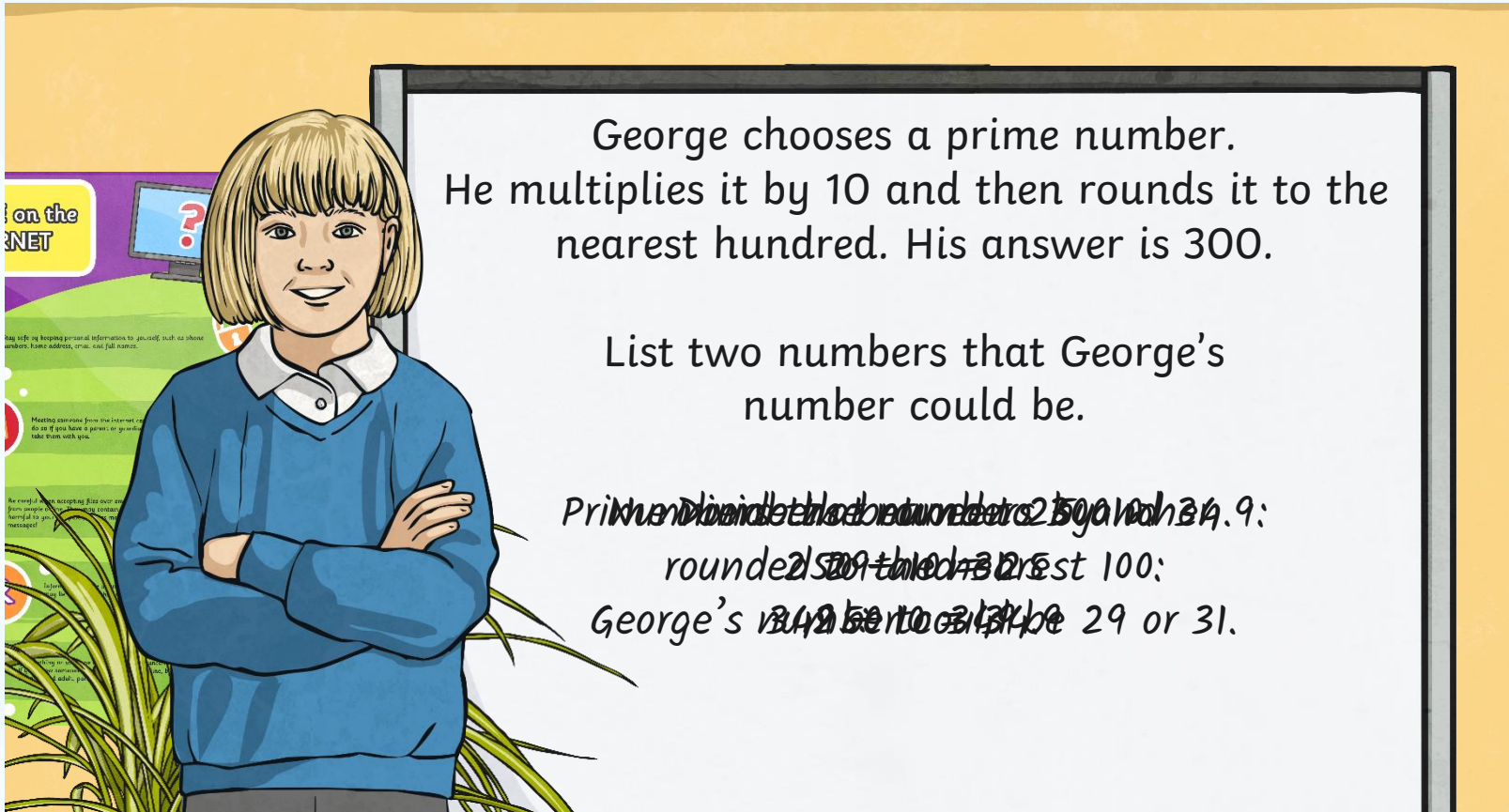
Next, let's think about what we already know in order to help us answer the question correctly.



These answers will then need to be divided by 10 and the prime numbers will then need to be identified between the two numbers.

Prime Numbers Reasoning 3a

Finally, let's check our answer with the information and key vocabulary in the question to make sure we have answered the question fully.



George chooses a prime number.
He multiplies it by 10 and then rounds it to the nearest hundred. His answer is 300.

List two numbers that George's number could be.

Prime numbers that rounded to 300 when multiplied by 10:
rounded to the nearest 100:
George's number could be 29 or 31.

Prime Numbers Reasoning 3b

Working with a partner, use your reasoning skills to solve the third question on your Talk Partner Activity Sheet.

Answers

Helena chooses a prime number.
She multiplies it by 10 and then rounds it to
the nearest hundred.
Her answer is 400.

List three numbers that Helena's number
could be.

Numbers that have been rounded
to 400 are 350, 400, 450:

Helena's number could be 37, 41 or 43.

Reasoning Practice



Have a go at independently solving the reasoning questions on your Independent Activity Sheet.

Independent Activity

I can solve reasoning questions using my knowledge of common factors, common multiples and prime numbers.

Solve these reasoning questions. Choose the challenge best for you.

| ★ | ★★ | ★★★ | | | |
|--|--|--|---|---|---|
| Tomas says that the highest common factor of 12 and 16 is 12. Is he correct? Explain your answer. <hr/> <hr/> <hr/> | Write a two-digit number that has 2, 3 and 7 as factors. | Choose two cards each time to make the following two-digit numbers. <table border="1"><tr><td>1</td><td>5</td><td>2</td></tr></table> The highest common factor of 36 and 48: <input type="text"/> <input type="text"/> The highest common factor of 45 and 60: <input type="text"/> <input type="text"/> | 1 | 5 | 2 |
| 1 | 5 | 2 | | | |
| Write two common multiples of 3 and 4 that are less than 20. | Write a value for y so that $10y + 2$ is a common multiple of 2 and 8. | Write a value for y so that $12y + 3$ is a common multiple of 3, 7 and 9. | | | |

Reasoning Answers



Line 1

| ★ | ★★ | ★★★ |
|--|---|--|
| <p>Tomas says that the highest common factor of 12 and 16 is 12. Is he correct? Explain your answer.</p> <p><i>Tomas is incorrect. 12 is not a factor of 16. The highest common factor of 12 and 16 is four.</i></p> | <p>Write a two-digit number that has 2, 3 and 7 as factors.</p> <p>84</p> | <p>Choose two cards each time to make the following two-digit numbers. (1, 5, 3)</p> <p>The highest common factor of 36 and 48: 12</p> <p>The highest common factor of 45 and 60: 15</p> |

Reasoning Answers



Line 2

| ★ | ★★ | ★★★ |
|---|--|---|
| <p>Write two common multiples of 3 and 8 that are less than 60.</p> <p><i>24 and 48</i></p> | <p>Write a value for y so that $10y + 2$ is a common multiple of 3 and 8.</p> <p><i>$y = 7$</i></p> | <p>Write a value for y so that $12y + 3$ is a common multiple of 3, 7 and 9.</p> <p><i>$y = 5$</i></p> |

Reasoning Answers



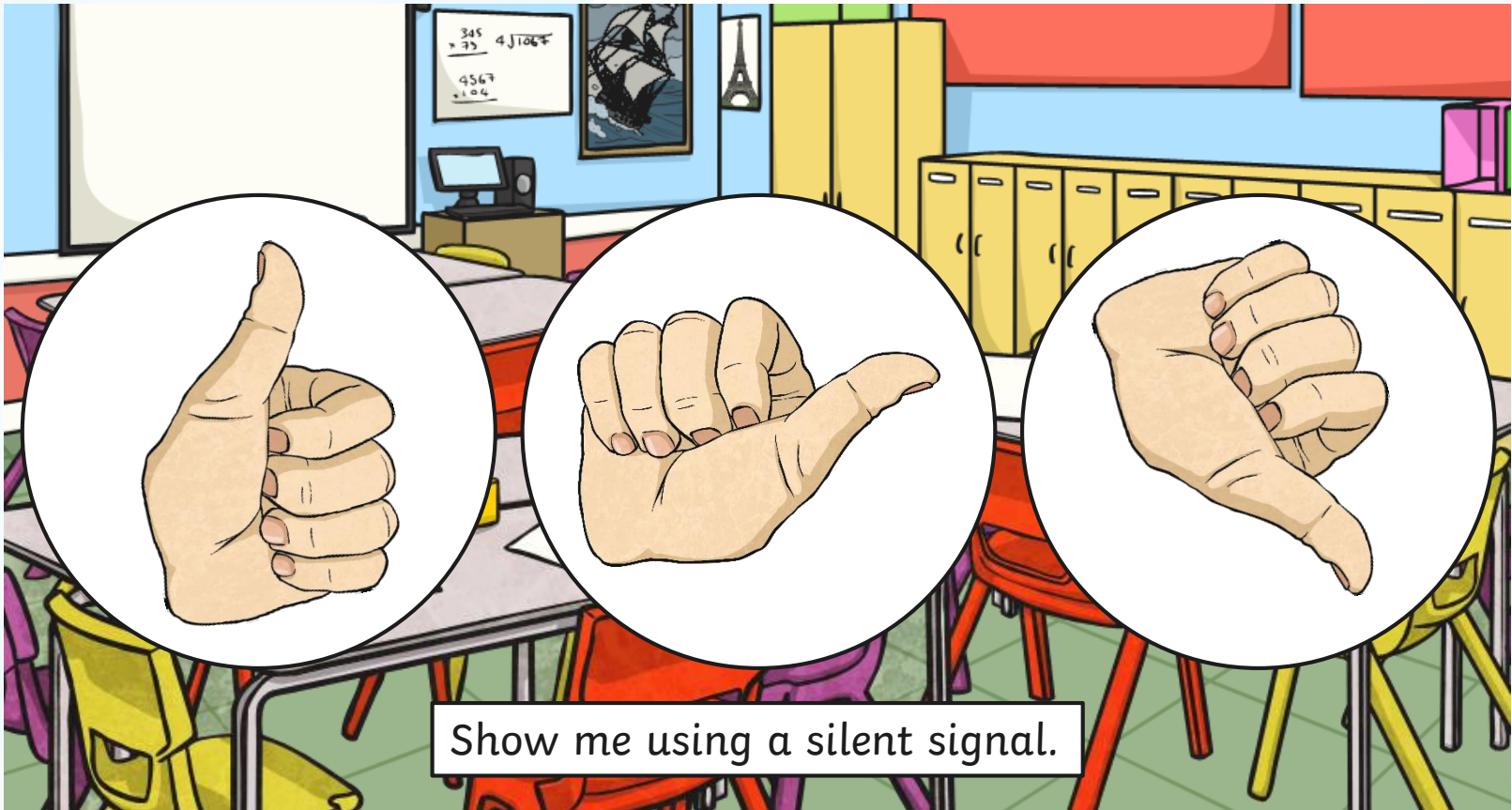
Line 3

| ★ | ★★ | ★★★ |
|--|---|---|
| <p>Johan thinks of two prime numbers. He adds them together to make 28. What could his numbers be?</p> <p><i>5 and 23</i> <i>11 and 17</i></p> | <p>Write three prime numbers that add together to make 87.</p> <p><i>17, 29, 41</i></p> | <p>Write three prime numbers which multiply to make 1001.</p> <p><i>$7 \times 11 \times 13 = 1001$</i></p> |

Reasoning Answers



How confident do you feel about solving reasoning questions about common multiples, common factors and prime numbers?



Show me using a silent signal.

Aim



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