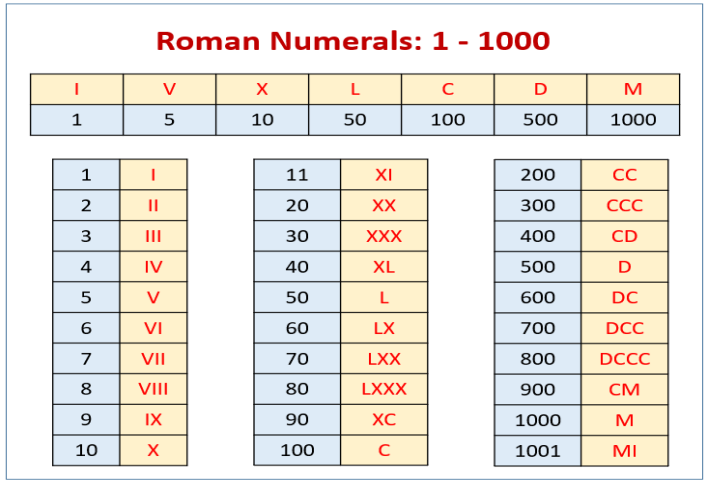
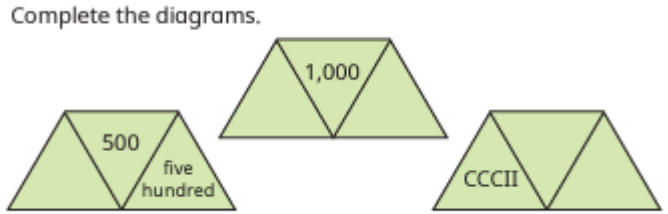
Maths – Place Value

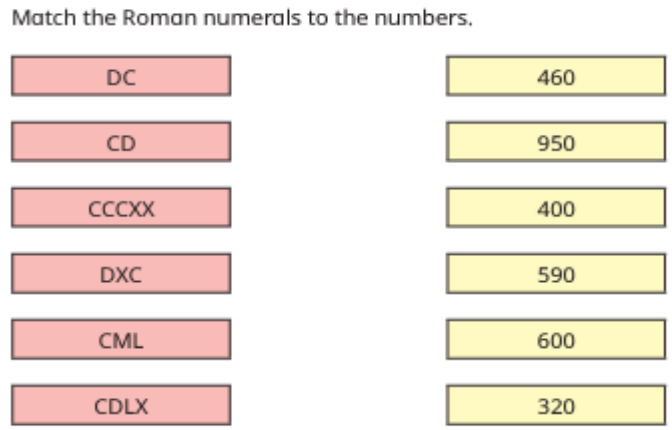
YEAR 5

Small Steps:

1. Roman numerals to 1,000.
2. Numbers to 10,000.
3. Numbers to 100,000.
4. Numbers to 1,000,000.
5. Read and write numbers to 1,000,000.
6. Powers of 10.
7. 10/100/1,000/10,000/ 100,000 more or less.
8. Partition numbers to 1,000,000.
9. Number line to 1,000,000.
10. Compare and order numbers to 100,000.
11. Compare and order numbers to 1,000,000.
12. Round to the nearest 10, 100 or 1,000.
13. Round within 100,000.
14. Round within 1,000,000.







Key Questions:

- What patterns can you see in the Roman number system?
- What rules do we use when converting numbers to Roman Numerals?
- What letters are used in the Roman number system? What does each letter represent?
- How do you know what order to write the letters when using Roman Numerals?
- What is the same and what is different about representing the number "five hundred and three" in the Roman number system and in our number system?

Here is a date written in Roman numerals.

XXI / IX / MMXV

What day of the month is shown?

What month is shown?

What year is shown?

Stem Sentences:

- The letter _____ represent the number _____.
- I know _____ is greater than _____ because...

Key Vocabulary:

Roman numerals
hundred
thousand
D
M
similarities
differences
Roman number system
zero
placeholders
years
date
patterns
rules
converting
letters
represent
order
same
different
greater than
less than

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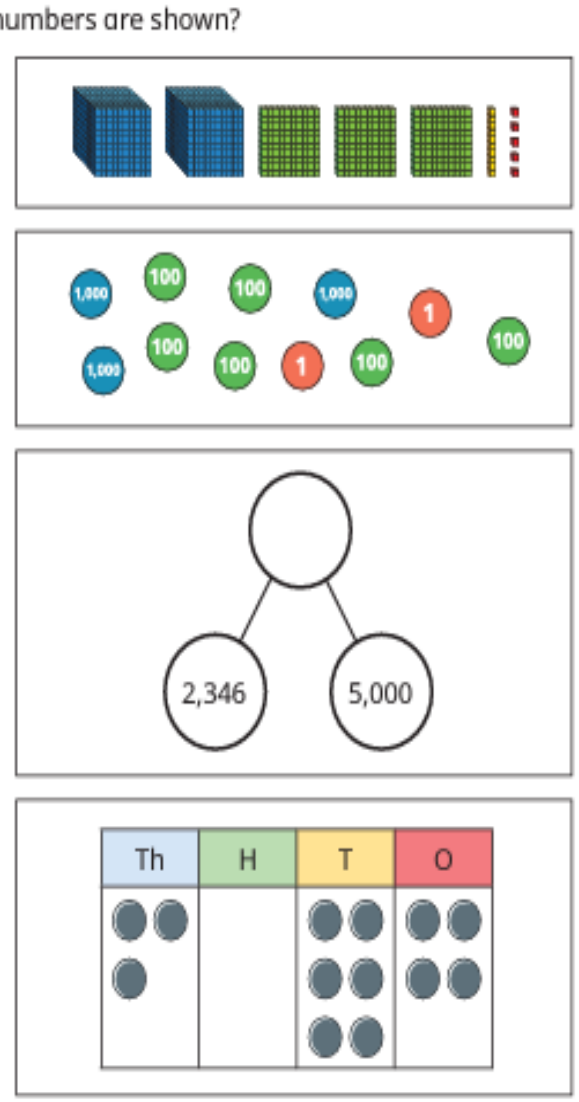
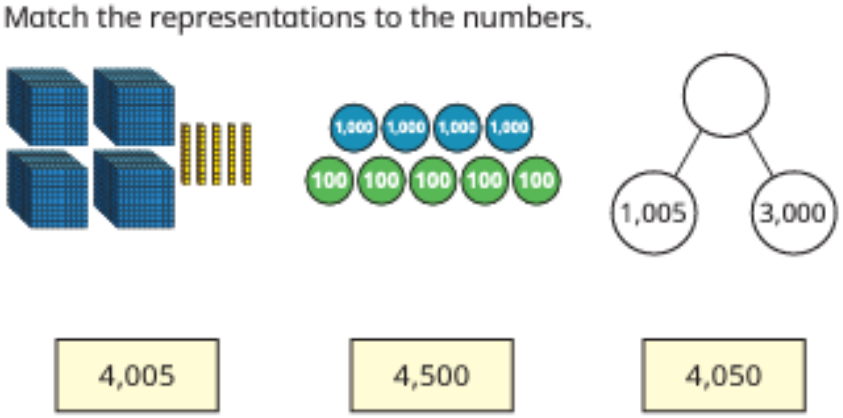


Key Questions:

- What is the value of each digit in the number?
- How can you represent the number in a different way?
- Which digit or digits would change in value if you added a 10/100/1000 counter?
- How do you write the number in words?



Stem Sentences:

- The value of the ____ in ____ is ____.
- The column before/after the ____column is the ____ column.
- 10 ____ can be exchanged for 1 ____
- 1____ can be exchanged for ____.

Key Vocabulary:

ten thousand
base 10
place value
part-whole
5-digit
6-digit
add
subtract
ten
hundred
thousand
value
digit
represent
different
change
words
column
before
after
exchanged

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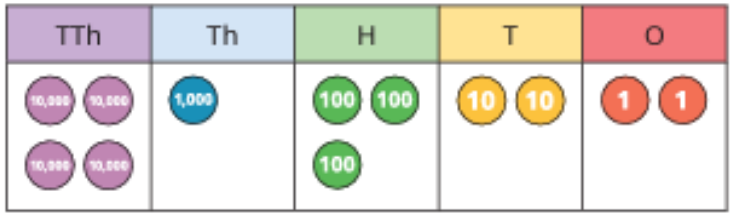
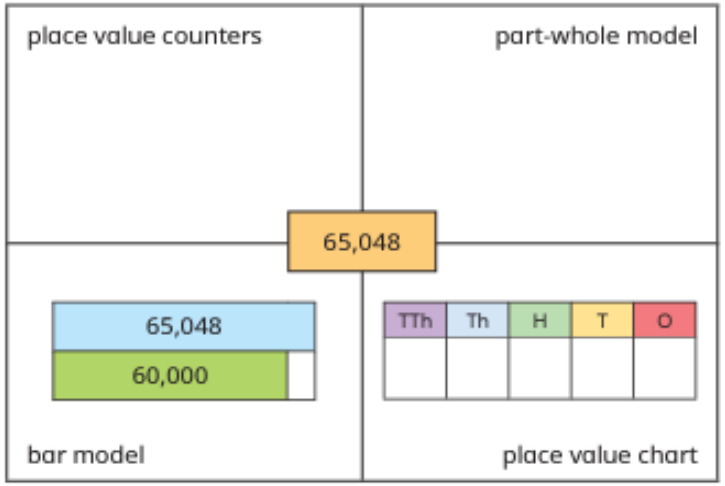
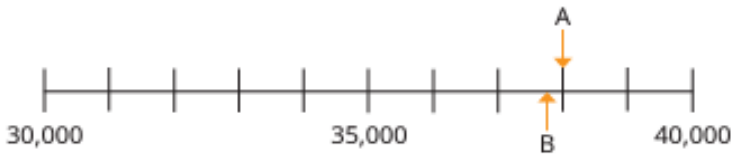
What number is shown on the place value chart?



Complete the grid to show the number in different ways.





Key Questions:

- Counting in 1,000's, what would you say after "nine thousand"?
- Counting in 10,000's, what would you say after "sixty thousand"?
- How can you represent the number 65,000 using a number line?
- What is the value of each digit in the number?
- If 10,000 is the whole, what could the parts be?

List all the 5-digit numbers you can make using the digit cards.

1	2	0	0	0

Stem Sentences:

- The value of the ____ in ____ is____.
- The column before/after the ____column is the ____ column.

Key Vocabulary:

hundred thousand
ten-thousands
column
place value
multiples
number line
value
estimate
position
counting
before
after
represent
whole
parts

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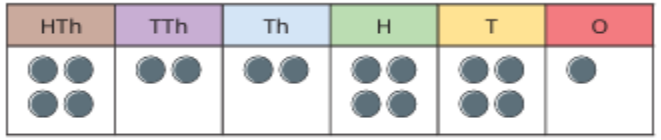
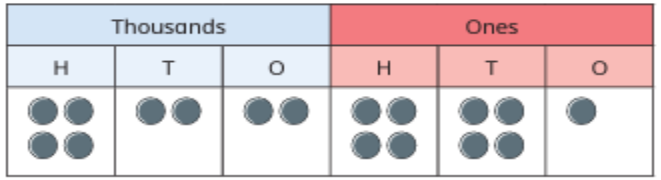
What number is shown in each place value chart?

Give your answers in numerals.





What is the value of the 4 in each number?

124,306	245,812	402,001
321,247	604,513	45,872

one hundred and forty-five thousand and three hundred and sixty-two

Key Questions:

- Where do the commas go when writing one million in numerals?
- How does a place value chart help you to represent large numbers?
- What is the value of each digit in this number?
- Are 6-digit numbers always greater in value than 5-digit numbers?
- When do you use placeholders in numbers?
- If one million is the whole, what could the parts be?
- When a number is written with commas, what do the numbers before/after each comma represent?
- How can this number be represented using a part-whole model? What parts would it be sensible to use?
- How do you write "1,000,000" in words?
- When do you use the word "and" when reading or writing a number?

Stem Sentences:

- The value of the ____ in ____ is ____.
- The column before/after the ____ column is the ____ column.
- The number before/after the commas is ____. This part of the number is said/written as ____.
- The whole of the number is said/written as ____.

Key Vocabulary:

million
pattern
thousands
place value
ones
tens
hundreds
thousands
ten thousands
hundred thousands
partitioning
numerals
commas
value
digit
6-digit
greater
5-digit
placeholders
whole
parts
part-whole

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YEAR 5

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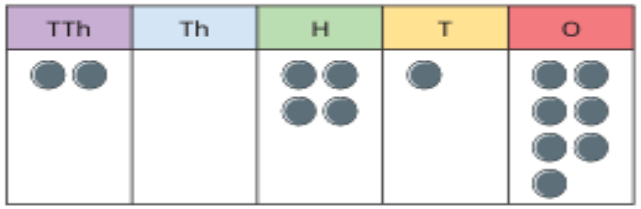
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

20,417 is shown in the place value chart.



What is 100 more than 20,417?

What is 10 less than 20,417?

What is 1,000 less than 20,417?

Complete the number tracks.

663	673		693		713	

7,200		7,000			

7,200		6,800			

Key Questions:

- How can you tell is a number is a power of 10?
- Is this number a multiple of a power of 10? How can you tell?
- If you move a digit one place to the left in a place value chart, how many times greater is the value of the digit?
- If you move a digit two places to the left in a place value chart, how many times greater is the value of the digit?
- What patterns can you see in the Gattegno chart?
- How can you use a place value chart to find 10/100/1,000 more or less than a given number?
- How can you use a Gattegno chart to find 10/100/1000 more/less than a given number?
- How many digits of the number will change if you add 10/100/1000 to the given number?
- What is the same and what is different about the patterns of the numbers vertically and horizontally in a Gattegno chart?

Stem Sentences:

- There are ____hundreds in 1,000 and ____ thousands in _____. This means there are _____ in _____.
- _____ is ____ the size of ____.
- ____ more/less than ____ is ____.
- ____ is ____ more/less than ____.

Key Vocabulary:

columns
adjacent
tens
hundreds
thousand
multiples
place value chart
Gattegno chart
multiply
multiplication
power of 10
left/right
greater
more/less
patterns
the size of
forwards
backwards
sequences
rule
values
between
crossing
same/different
vertically/horizontally

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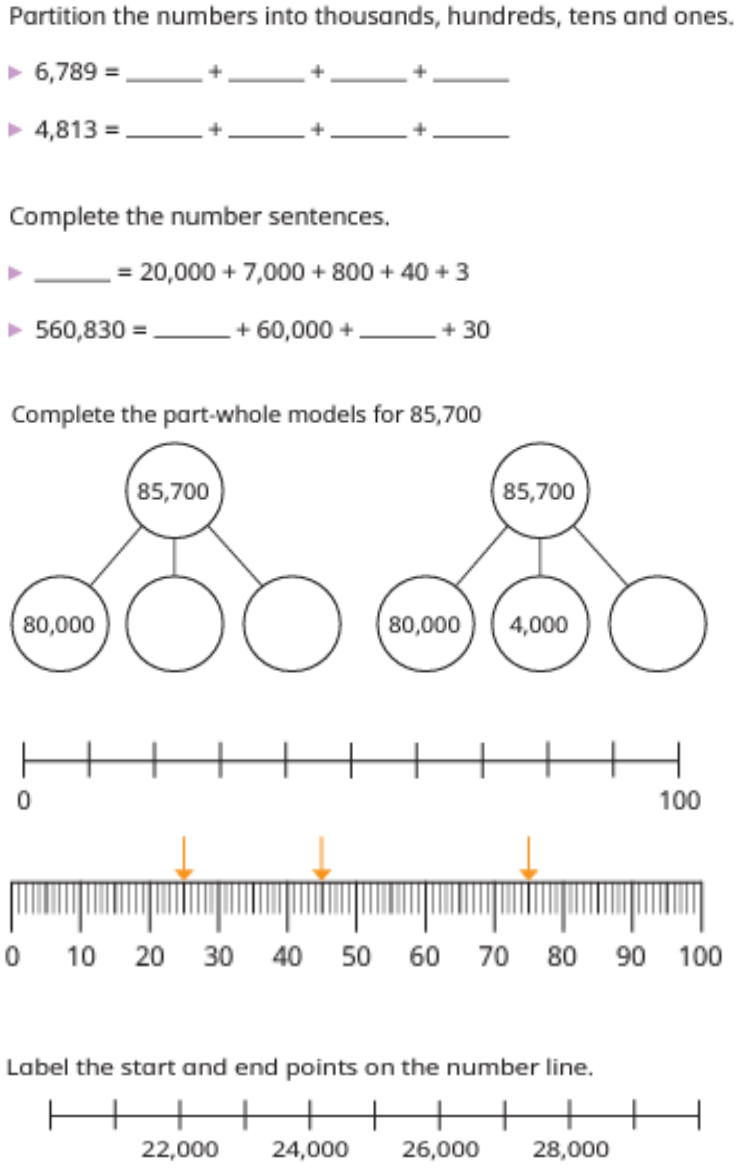

Key Questions:

- What number is being represented?
- How can place value cards be sued to help partition a number?
- If you have 10 hundreds/thousands/tens-thousands, what can these be exchanged for?
- How does knowing that 9 + 5 = 14 help you to work out 9 tens + 5 tens? What about 9 thousands + 5 thousands?
- How else can you say/write "14 tens" or "14 thousands"?
- What are the values at the start and the end of the number line?
- How many large intervals are there in the whole number line? What is each large interval worth?
- How many small intervals are there between each of the large intervals on the number line? What is each small interval worth?
- What is the midpoint between ____ and ____?

Stem Sentences:

- The value of the first digit is ____.
- The value of the next digit is ____.
- ____ is equal to ____ thousands, ____ hundreds, ____ tens and ____ ones.
- The difference in value between the start and end point is ____.
- There are ____ intervals.
- The number line is counting up in ____.

Key Vocabulary:

partitioning
place value
columns
ten-thousands
thousands
hundreds
tens
ones
exchanged
value
digit
equal to
number line
label
placement
multiples
midpoint
start/end point
intervals
whole
worth
difference

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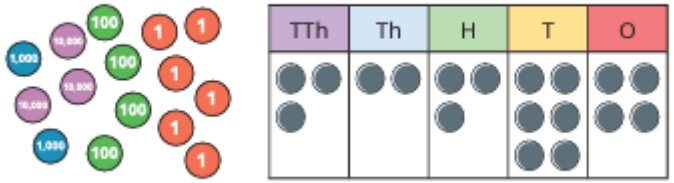
- Which is the greater number?



Write <, > or = to make the statements correct.

45,000 ◯ 54,000

10,160 ◯ 9,999

65,000 ◯ 60,700

Write the numbers in ascending order.

34,706	MMMDXL	3,099
5,000 more than thirty thousand		thirty-three thousand and thirty-three

Key Questions:

- Which digit in each number has the greatest value?
- What are the values of these digits?
- When comparing two numbers with the same number of digits, if the first digits are equal in value, what do you look at next?
- What is the difference between ascending and descending order?
- What is different about comparing number with the same number of digits and comparing numbers with different number of digits?

- Put the numbers in order, starting with the smallest.

You can use the number line to help you.

6,400 60,400 46,000 40,600 20,600 6,004

Stem Sentences:

- The first place value column I need to look at is ____.
- ____ is greater/less than ____, so ____ is greater/less than ____.

Key Vocabulary:

comparing
ordering
hundred thousand
place value
number lines
digits
pairs
sets of
Roman numerals
greatest
greater
smallest
less than
value
equal
difference
ascending
descending

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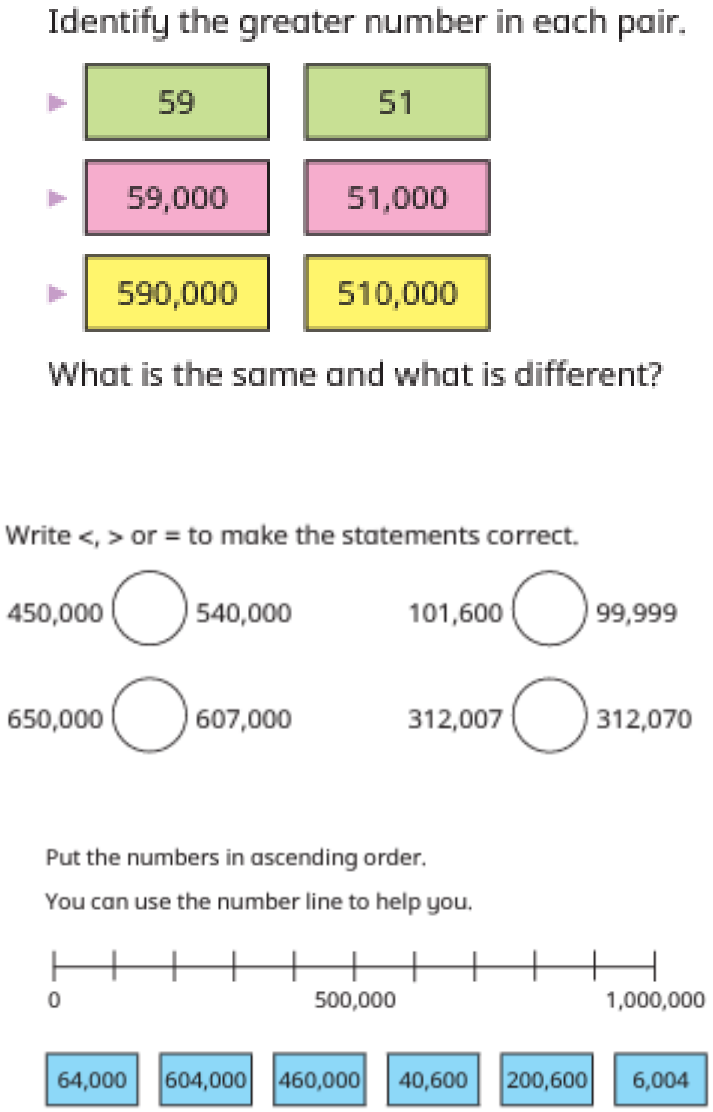

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- Which digit in each number has the greatest value? What are the values of these digits?
- When comparing two numbers with the same number of digits, if their first digits are equal in value, what do you look at next?
- What is the difference between ascending and descending order?
- What is different about comparing numbers with the same number of digits and comparing numbers with different numbers of digits?

List the towns and cities in descending order of population.

Town or city	Population
Halifax	88,134
Brighouse	32,360
Leeds	792,925
Huddersfield	146,234
Wakefield	343,932
Bradford	536,986

Stem Sentences:

- The first place value column I need to look at is ____.
- ____ is greater/less than ____, so ____ is greater/less than ____.

Key Vocabulary:

compare
order
million
number lines
increasing
value
position
horizontal
digit
greatest
greater
less than
equal
difference
ascending
descending
place value
column

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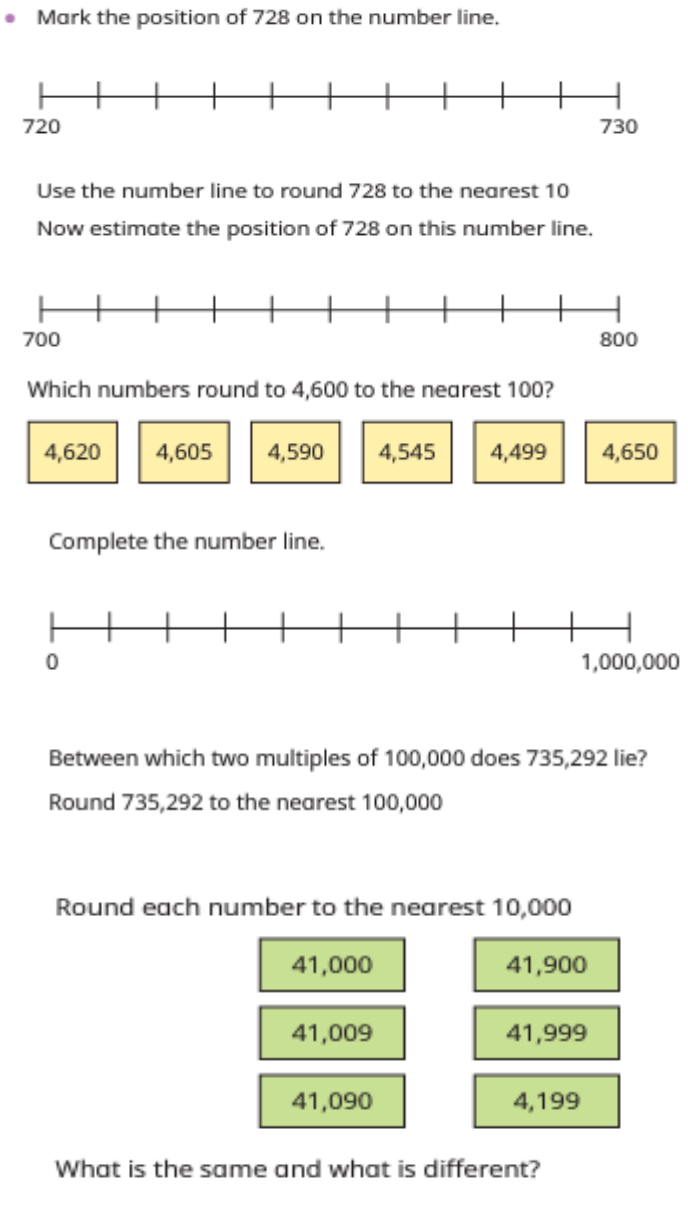


Key Questions:

- Which multiples of 10/100/1,000/10,000/100,000 does the number lie between?
- Which multiple on the number line is the number closer to?
- What is the number rounded to the nearest 10/100/1,000/10,000/100,000?
- Which place value column should you look at to round the number to the nearest 10/100/1000/10,000/100,000?
- What happens when a number is exactly halfway between two numbers on a number line?
- Which division on the number line is the number closer to?
- What happens if a number lies exactly halfway between two multiples of 10,000?
- How can you represent the rounding of this number on a number line?
- What is the most appropriate way of rounding this number?

Key Vocabulary:

rounding
ten
hundred
thousand
ten-thousand
hundred-thousand
million
rounding to the nearest
number line
multiples
closer to
place value
halfway
column
midpoint
digit
division
power of 10
approximations

Stem Sentences:

- The previous multiple of 10/100/1,000/10,000/100,000 is _____.
- The next multiple of 10/100/1,000/10,000/100,000 is _____.
- _____ is closer to _____ than _____.
- _____ rounded to the nearest 10/100/1,000/10,000/100,000 is _____.

Maths – Addition and Subtraction

YEAR 5

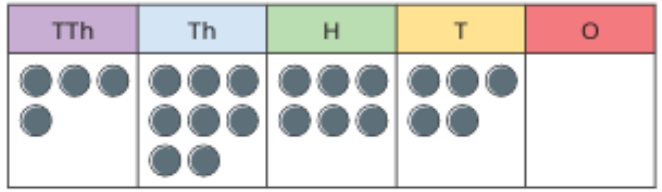
Small Steps:

1. Mental strategies.
2. Add whole numbers with more than four digits.
3. Subtract whole numbers with more than 4 digits.
4. Round to check answers.
5. Inverse operations (addition and subtraction).
6. Multi-step addition and subtraction problems.
7. Compare calculations
8. Find missing numbers.

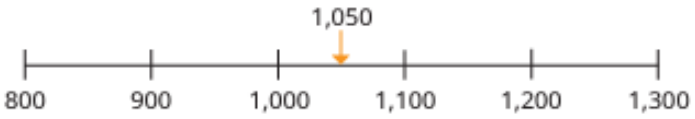
Use the fact that 8 + 4 = 12 to work out the additions.

- 8,000 + 4,000
- 800 + 400
- 80,000 + 40,000

Use the place value chart to help you work out the subtractions.



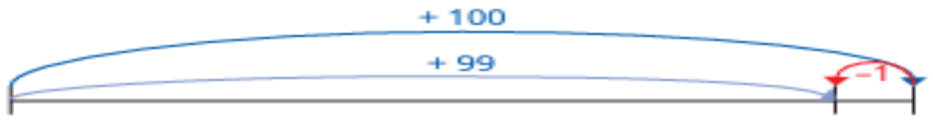
- 48,650 – 3,000
- 43,650 – 200
- 43,650 – 10
- 48,650 – 3,210
- 48,650 – 7,100
- 48,650 – 5,030



Use the number line to help you work out the calculations.

- 1,050 + 100
- 1,050 – 100

The number line shows a method for adding 99 mentally.



Use the number line to help you add 99 to 687

Use a similar number line to help you subtract 99 from 687

Key Questions:

- How does knowing that 2 + 5 = 7 help you to work out 20,000 + 50,000?
- How can the numbers be partitioned to help add/subtract them?
- Are any of the numbers multiples of powers of 10? How does this help you to add/subtract them?
- What number is 999 close to? How does that help you to add/subtract 999 from another number?

Work out the calculations.

3,724 + 999	3,724 – 999
3,724 + 990	3,724 – 990

Work out the calculations.

46 + 29	460 + 290	460 + 299
59 + 59	590 + 590	599 + 599

Stem Sentences:

- The sum of ____ ones and ____ ones is ____ ones, so the sum of ____ thousands and ____ thousands is ____ thousands.
- I can partition the number into ____, ____ and ____ and add the parts separately.

Key Vocabulary:

mentally
calculate
sums
differences
partitioning
number bonds
place value
add
subtract
multiples
powers of 10
forwards
backwards
formal written method
strategies
close to

Maths – Addition and Subtraction

YEAR 5

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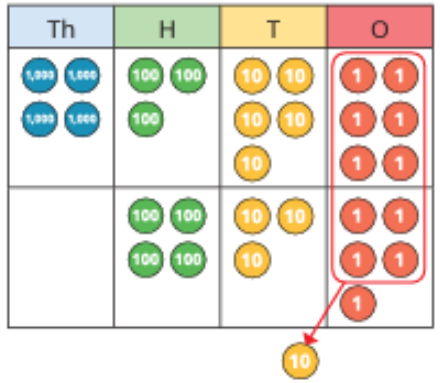
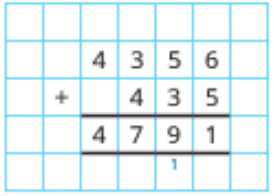
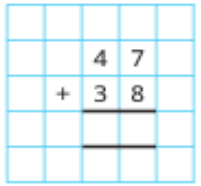
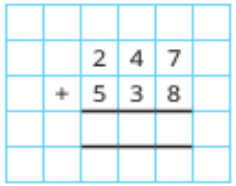
Ron uses place value counters to calculate 4,356 + 435

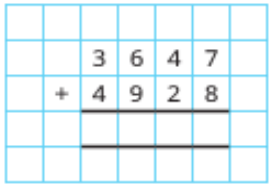




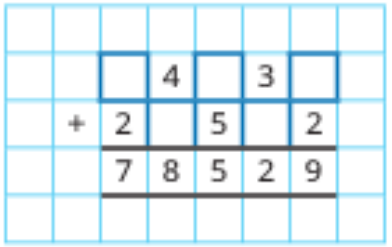
Use the column method to work out the additions.







Work out the missing numbers.



What mistake has been made?

1,562 + 301 = 4,572

Key Questions:

- Does it matter which number goes at the top when using the column method?
- Will you need to make an exchange? Which columns will be affected if you do? How do you know?
- Does it matter if the numbers have different numbers of digits?
- How do you know which digits to "line up" in the calculation?
- How do you know if the calculation is an addition?

Find the answers to the calculations.

In each case decide whether a mental method or written method is more appropriate.

12,724 + 43,610	63,800 + 2,002
9,999 + 8,712	313,500 + 89,019

Stem Sentences:

- In column addition, we start from the place value column that has the _____ value.
- The _____ is in the _____ column. It represents _____.

Key Vocabulary:

column method
addition
4-digits
place value
calculations
exchange
columns
digits
figures
rounding
estimate

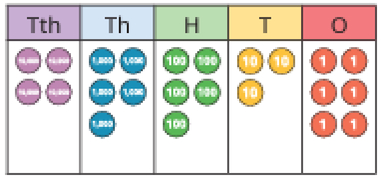
Maths – Addition and Subtraction

YEAR 5

Small Steps:

1. Mental strategies.
2. Add whole numbers with more than four digits.
3. Subtract whole numbers with more than 4 digits.
4. Round to check answers.
5. Inverse operations (addition and subtraction).
6. Multi-step addition and subtraction problems.
7. Compare calculations
8. Find missing numbers.

Use the place value chart and the column method to help you.



	4	5	5	3	6
−		8	4	2	6

Use the column method to work out the subtractions.

	8	4
−	3	6

	6	3	2
−	4	1	7

	4	6	8
−	2	9	3

	3	1	2	5
−	2	4	1	7

Work out the missing numbers.

	5		4		8
−		1		2	
	2	0	8	5	8

Work out the missing numbers.

	6		2		6
−		8		7	
	3	6	7	4	4

Key Questions:

- Which numbers goes at the top when using column method? Does this affect the final answer?
- Will you need to make an exchange? Which columns will be affected if you do? How do you know?
- Does it matter if the numbers have different numbers of digits?
- How do you know which digits to "line up" in the calculation?
- How do you know if the calculation is a subtraction?

In each case, decide whether a mental method or written method is more appropriate.

12,000 – 2	46,312 – 15,000
35,295 – 16,359	90,000 – 23,518

Stem Sentences:

- In column subtraction, we start from the place value column that has the ____ value.
- There are not enough _____, so I need to exchange 1 ____ for 10 ____.

Key Vocabulary:

column method
subtraction
4-digits
place value
calculation
exchange
digits
figures
placeholder

Maths – Addition and Subtraction

YEAR 5

Small Steps:

1. Mental strategies.
2. Add whole numbers with more than four digits.
3. Subtract whole numbers with more than 4 digits.
4. Round to check answers.
5. Inverse operations (addition and subtraction).
6. Multi-step addition and subtraction problems.
7. Compare calculations
8. Find missing numbers.

Round the numbers to find an estimate of the answer to 6,789 + 2,870

6,789 rounded to the nearest 1,000 is _____

2,870 rounded to the nearest 1,000 is _____

The estimated total is _____ + _____ = _____

Compare the estimate with the actual answer.

Round each number to the nearest 100,000 to estimate the answers to the calculations.

517,000 + 289,000	517,000 – 289,000
126,539 + 723,628	809,375 – 610,005

Mo has completed an addition.

31,207 + 6,529 = 96,497

Use an estimate to show that Mo must have made a mistake.

The table shows the number of tickets sold by an airline during a three-month period.

Month	Tickets sold
February	18,655
March	31,402
April	27,092

- Work out the total number of tickets sold in February and March.

Use an estimate to check your answer.

Key Questions:

- Which multiples of ___ does the number lie between?
- Which division on the number line is the number closer to/
- What is the number rounded to the nearest ____?
- What place value column should we look at to round the number to the nearest 10/100/1,000/10,000/100,000?
- How could you use your estimates to check your answers?
- Is the actual answer going to be greater or less than your estimate? Why?

Mrs Khan wants to buy a laptop, a monitor and a keyboard.

Mrs Khan has £1,700

Estimate whether she can afford all three items.

Stem Sentences:

- The previous multiple of _____ is _____.
- The next multiple of _____ is _____.
- _____ rounded to the nearest _____ is _____.
- The approximate answer is _____.

Key Vocabulary:

rounding
estimate
addition
subtraction
mental strategy
approximate
accuracy
calculation
multiples
division
number line
closer to
place value
column
greater than
less than

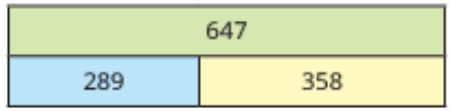
Maths – Addition and Subtraction

YEAR 5

Small Steps:

1. Mental strategies.
2. Add whole numbers with more than four digits.
3. Subtract whole numbers with more than 4 digits.
4. Round to check answers.
5. Inverse operations (addition and subtraction).
6. Multi-step addition and subtraction problems.
7. Compare calculations
8. Find missing numbers.

Write two additions and two subtractions shown by the bar model.



Aisha works out an addition.

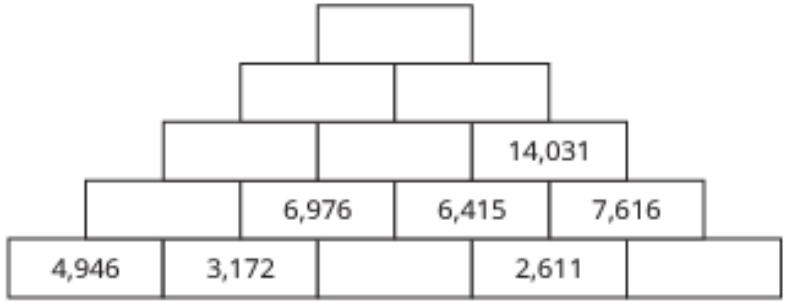
65 + 78 = 143

Which subtractions can be used to check Aisha's addition?

143 – 78 | 78 – 65 | 143 – 65 | 78 – 143

In the number pyramid, each number is the sum of the two numbers below.

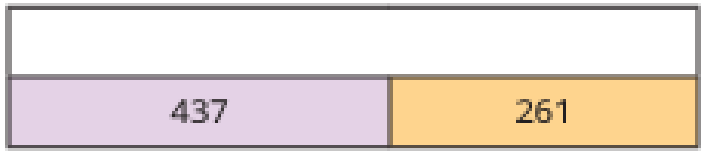
Use addition and subtraction to complete the pyramid.



Key Questions:

- If I add a number to another to get a total, what do you need to do to the total to find my original number?
- If I subtract a number from another to find the difference, what do you need to do to the difference to find my original number?
- What does an inverse operation do?
- What operation is the inverse of addition?
- What operation is the inverse of subtraction?

Complete the bar model.



Check your answer using a subtraction.

Stem Sentences:

- The inverse of _____ is _____.
- To check that I have added/subtracted _____ correctly, I need to _____.

Key Vocabulary:

addition
subtraction
inverse
operations
commutative
bar models
part-whole
fact families
accuracy
equations
total
difference

Maths – Addition and Subtraction

YEAR 5

Small Steps:

1. Mental strategies.
2. Add whole numbers with more than four digits.
3. Subtract whole numbers with more than 4 digits.
4. Round to check answers.
5. Inverse operations (addition and subtraction).
6. Multi-step addition and subtraction problems.
7. Compare calculations
8. Find missing numbers.

Filip is writing a report.

He writes the first 460 words on Monday and another 735 words on Tuesday.

The report must be at least 2,500 words long.

How many more words does Filip need to write?

Year 5 and Year 6 are going on a school trip.

The school has a bus with 56 seats and a minibus with 17 seats.

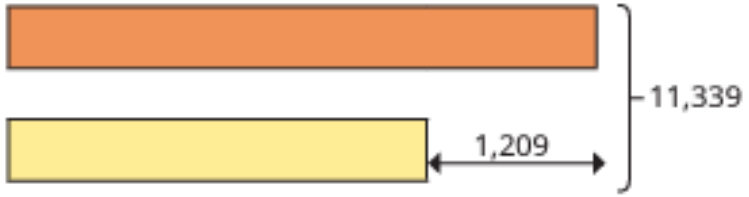
There are 44 people in the Year 5 group and 38 people in the Year 6 group.

How many more seats are needed for both groups to go on the trip?

The sum of two numbers is 11,339

The difference between the numbers is 1,209

Use the bar model to help you find the two numbers.



Key Questions:

- What is the key information in the question?
- What can you work out straight away? How does this help you to answer the question?
- How can you represent this problem using a bar model? Which bar will be longer? Why?
- Do you need to add or subtract the numbers at this stage? How do you know?
- How can you check your answer?

Mr Rose is buying items for his home.

He has a budget of £1,500

He buys a washing machine and a tumble dryer.

Does he have enough money left to buy the dishwasher?

Stem Sentences:

- The first step in solving the problem is...
- When I know ____, I can then ____.
- To check my answer, I can...

Key Vocabulary:

addition
subtraction
multi-step
operations
calculations
mental/written method
bar model
division
inverse
approximations

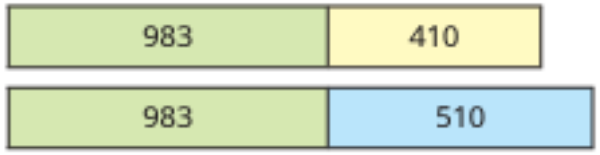
Maths – Addition and Subtraction

YEAR 5

Small Steps:

1. Mental strategies.
2. Add whole numbers with more than four digits.
3. Subtract whole numbers with more than 4 digits.
4. Round to check answers.
5. Inverse operations (addition and subtraction).
6. Multi-step addition and subtraction problems.
7. Compare calculations
8. Find missing numbers.

Which calculation has the greater answer, 983 + 410 or 983 + 510?



Use the bar model to explain your answer.

Which calculation has the greater answer?

983 – 410 | 983 – 510

How do you know?

Write >, < or = to complete the calculations.

47 + 28 ◯ 37 + 28

64 + 91 ◯ 91 + 64

651 – 286 ◯ 651 – 283

Key Questions:

- What is the same and what is different about the numbers in the two calculations?
- Which digits have changed and which have stayed the same?
- How will the answer change if you increase one of the numbers by ____?
- How will the answer change if you decrease one of the numbers by____?
- How will the answer change if you increase/decrease both of the numbers by ____?

Put the addition cards in order of size, starting with the one with the greatest answer.

463 + 127 | 563 + 327 | 483 + 127 | 463 + 327 | 463 + 337

Stem Sentences:

- If I add/subtract ____ to/from one of the numbers in the calculation, the answer will change by ____.
- If I add/subtract ____ to/from both of the numbers in the calculation, the answer will change by ____.

Key Vocabulary:

compare
calculations
comparison
structure
adding
subtracting
bar model
relationships
2-digit
3-digit
same
different
increase/decrease

Maths – Addition and Subtraction

YEAR 5

Small Steps:

1. Mental strategies.
2. Add whole numbers with more than four digits.
3. Subtract whole numbers with more than 4 digits.
4. Round to check answers.
5. Inverse operations (addition and subtraction).
6. Multi-step addition and subtraction problems.
7. Compare calculations
8. Find missing numbers.

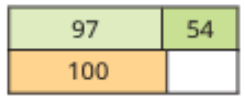
Complete the calculations.

- _____ – 100 = 5,823
- _____ – 1,000 = 5,823
- 5,423 + _____ = 5,823
- 3,623 + _____ = 5,823

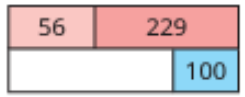
Complete the calculations.

Use the bar models to help you.

97 + 54 = 100 + _____



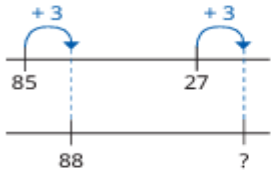
56 + 229 = _____ + 100



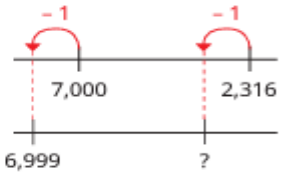
Complete the calculations.

Use the number lines to help you.

85 – 27 = 88 – _____



7,000 – 2,316 = 6,999 – _____



Use the first bar model to work out the missing number in the second bar model.

Key Questions:

- What is the same and what is different about the numbers in the two calculations?
- If the two additions/subtractions have the same result, what does that tell you about the numbers in the additions/subtractions?
- If you increase/decrease the first number by _____, what do you need to do to the second number for the total/difference to stay the same?

Match the calculations that have the same results.

623 + 418	849 – 332
725 + 517	621 + 420
847 – 329	848 – 330
846 – 329	520 + 722

Stem Sentences:

- _____ has been added/subtracted to/from the first number, so _____ must be _____ to/from the second number to keep the total the same.
- _____ has been added/subtracted to/from the first number, so _____ must be _____ to/from the second number to keep the difference the same.

Key Vocabulary:

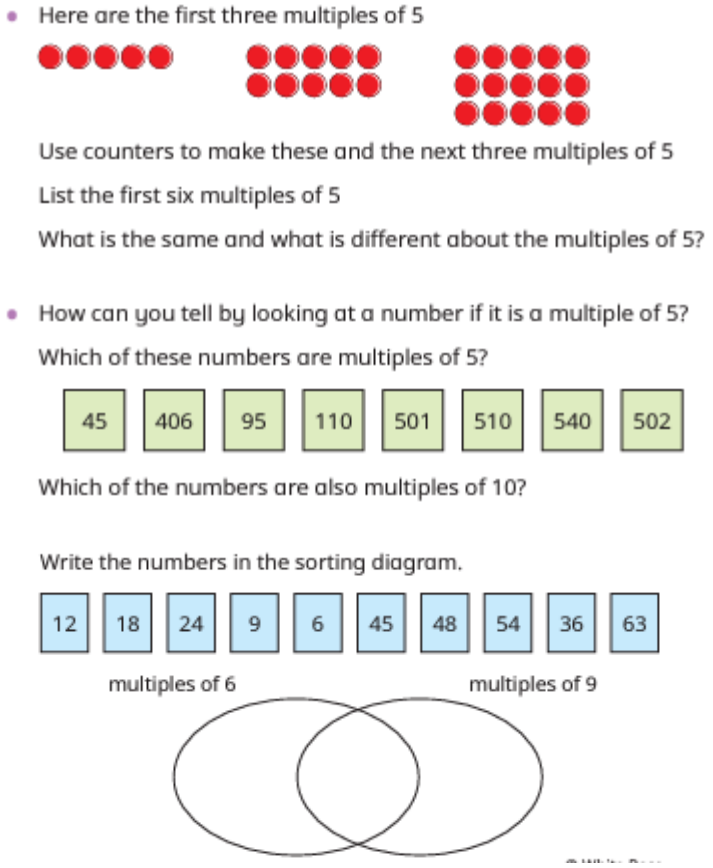
inverse
operations
missing number
calculation
comparing
increased
difference
total
decreased
bar models
number lines
estimate
approximate
sense-checking
same
different
addition
subtraction

Maths – Multiplication and Division A

YEAR 5

Small Steps:

1. Multiples.
2. Common multiples.
3. Factors.
4. Common factors.
5. Prime numbers.
6. Square numbers.
7. Cube numbers.
8. Multiply 10, 100 and 1000.
9. Divide by 10, 100 and 1,000.
10. Multiples of 10, 100 and 1,000.



- Sort the numbers from 1 to 30 into the table.

	Multiple of 7	Not a multiple of 7
Multiple of 4		
Not a multiple of 4		

Key Questions:

- How do you find the multiples of a number?
- What do you notice about the multiples of ____?
- What is the same and what is different about them?
- Can a number be a multiple of more than one number?
- How can you tell if a number is a multiple of 2/5/10?
- What does the word "divisible" mean? How does it link to multiples?
- Are multiples of 8/4 also multiples of 4/8?
- How do you find the multiples of a number?
- What multiples do ____ and ____ have in common?
- What is the first multiple that ____ and ____ have in common?
- How can you tell if a number is a multiple of ____?
- Given any two numbers, can you always find a common multiple? How?

Key Vocabulary:

multiples
times-table
positive
integer
rules of divisibility
arrays
same
different
divisible
common multiples
pair
LCM
lowest common multiple

Stem Sentences:

- A multiple is the result of multiplying a number by ____.
- The first multiple of a number is always ____.
- ____ is a multiple of ____ because ____ x ____ = ____.
- ____ is a common multiple of ____ and ____ because ____ x ____ = ____ and ____ x ____ = ____.
- The first common multiple of ____ and ____ is ____.

Maths – Multiplication and Division A

YEAR 5

Small Steps:

1. Multiples.
2. Common multiples.
3. Factors.
4. Common factors.
5. Prime numbers.
6. Square numbers.
7. Cube numbers.
8. Multiply 10, 100 and 1000.
9. Divide by 10, 100 and 1,000.
10. Multiples of 10, 100 and 1,000.

The array shows that 4 and 5 are factors of 20

How many other arrays can you make using 20 counters?

Use your arrays to find all the factors of 20

Which numbers are factors of 60?

9	6	8	4	12	5	60	15	45

Which factors of 60 are not shown?

Tiny has found the factors of 36

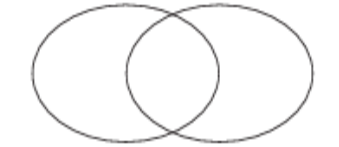
1	2	3	4	5	6
36	18	12	9	✗	6

Why does Tiny put a cross next to 5?

Why does Tiny stop after 6?

Write the numbers in the sorting diagram.

1	5	8	10	15	20



What other numbers can you add to the diagram?

Key Questions:

- How do you find the factors of a number?
- How can you be sure you have found all the factors of a number?
- How can you work in a systematic way to find all the factors of a number?
- Do factors always come in pairs?
- Can a number be both a factor and a multiple of the same number?
- Which numbers are factors of both the numbers?
- Which are the common factors of the numbers?
- On a sorting diagram, where can you see the common factors of the numbers?
- Why does any pair of numbers have at least one common factor?
- Can one of the numbers be a common factor? When does this happen?

Key Vocabulary:

factors
factor pairs
multiplied
multiplication
division
multiple
products
powers of 10
common factors
comparing
array
divisibility

Stem Sentences:

- _____ is a factor of _____ because _____ x _____ = _____.
- _____ is a factor of _____ because _____ ÷ _____ = _____.
- _____ is a factor of _____ because _____ is in the _____ times-table.
- _____ is a multiple of _____, so _____ is a factor of _____.
- _____ is a factor of _____ and a factor of _____, so _____ is a common factor of _____ and _____.
- The common factors of _____ and _____ are _____.

Maths – Multiplication and Division A

YEAR 5

Small Steps:

1. Multiples.
2. Common multiples.
3. Factors.
4. Common factors.
5. Prime numbers.
6. Square numbers.
7. Cube numbers.
8. Multiply 10, 100 and 1000.
9. Divide by 10, 100 and 1,000.
10. Multiples of 10, 100 and 1,000.

All of these numbers are prime numbers.

5	13	17	23

Use counters to find the factors of each number.

What do you notice?

Sort the numbers into the table.

12 2 7 20 9 15 3 17 21

	Prime	Composite
Even		
Odd		

Use your knowledge of multiples and factors to decide whether each number is prime.

70	92	51	61	81
29	57	43	63	77

Key Questions:

- How many factors does the number have?
- How can you be sure you have found all the factors?
- What is the difference between a prime number and a composite number?
- How can you tell if a number is a multiple of 2/3/5?
- How can you check if a number is a prime?
- How many factors does the number have?
- How many prime factors does the number have?

Sort all the prime numbers between 10 and 100 into the table.

Number of ones			
1	3	7	9

Decide whether each statement is true or false.

All prime numbers are odd.

All odd numbers are prime.

The first prime number is 1

Talk about your answers with a partner.

Stem Sentences:

- The only factors of ____ are ____ and _____, so ____ is prime.
- ____ is prime and a factor of ____, so ____ is a prime factor of ____.

Key Vocabulary:

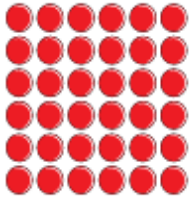
factors
prime numbers
composite numbers
times-table facts
rule of divisibility
multiple

Maths – Multiplication and Division A

YEAR 5

Small Steps:

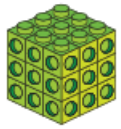
1. Multiples.
2. Common multiples.
3. Factors.
4. Common factors.
5. Prime numbers.
6. Square numbers.
7. Cube numbers.
8. Multiply 10, 100 and 1000.
9. Divide by 10, 100 and 1,000.
10. Multiples of 10, 100 and 1,000.



$6 \times 6 = 36$

Dora has used small cubes to make a cube with a side length of 3

I used 27 cubes, so the 3rd cube number is 27



Write <, > or = to compare the calculations.

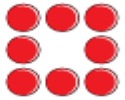
5 squared ◯ 4 cubed

5^3 ◯ 8^2

1^2 ◯ 1^3

45 squared ◯ 45 cubed

Tiny is using counters to make square numbers.



I have made a square with 8 counters, so 8 is a square number.

Do you agree with Tiny?

Explain your answer.

Complete the table.

Size of cube	Calculation	Number of cubes
1^3		1
2^3		8
3^3	$3 \times 3 \times 3$	
4^3		
5^3		
6^3	$6 \times 6 \times 6$	

Key Questions:

- Why are square numbers called "square" numbers?
- How do you work out ____ squared?
- How do you write ____ squared?
- Is 1 a square number? Why or why not?
- Are the squares of odd numbers even or odd?
- Are the squares of even number even or odd?
- Why are cube numbers called "cube" numbers?
- How do you work out ____ cubed?
- How do you write ____ cubed?
- Is 1 a cube number? Explain your answer.
- Are the cubes of odd numbers even or odd?
- Are the cubes of even numbers even or odd?

Key Vocabulary:

square number
result
multiplying
itself
times-tables
notation
factors
odd
even
factors
factor pair
cube number
whole number
cubed
squared
interlocking

Stem Sentences:

- A square number is the result of multiplying a number by ____.
- ____ is a square number because ____ x ____ = ____
- ____ squared means ____ x ____ and is the square number ____.
- The cube of a number is the result of multiplying the number by ____ and then by ____ again.
- ____ is a cube number because ____ x ____ x ____ = ____
- ____ cubed means ____ x ____ x ____ and is the cube number ____.

Maths – Multiplication and Division A

YEAR 5

Small Steps:

1. Multiples.
2. Common multiples.
3. Factors.
4. Common factors.
5. Prime numbers.
6. Square numbers.
7. Cube numbers.
8. Multiply 10, 100 and 1000.
9. Divide by 10, 100 and 1,000.
10. Multiples of 10, 100 and 1,000.

Use counters to make 234 on a place value chart.

HTh	TTh	Th	H	T	O
			●●	●● ●	●● ●●

If you multiply 234 by 10, where do the counters move to?

What is the result of multiplying 234 by 10?

If you multiply 234 by 100, where do the counters move to?

What is the result of multiplying 234 by 100?

Write <, > or = to complete the statements.

71 × 1,000 ◯ 71 × 100

100 × 32 ◯ 16 × 1,000

6×10^3 ◯ 45×10^2

Complete the divisions.

- 64,000 ÷ 10 = _____
  64,000 ÷ 100 = _____
  64,000 ÷ 1,000 = _____

HTh	TTh	Th	H	T	O
	6	4	0	0	0

- 604,000 ÷ 10 = _____
  604,000 ÷ 100 = _____
  604,000 ÷ 1,000 = _____

HTh	TTh	Th	H	T	O
6	0	4	0	0	0

Key Questions:

- In what direction do the digits move when you multiply by 10/100/1000?
- How many places to the left do the digits move when you multiply by 10/100/1000?
- When you have an empty place value column, what digit do you use as a placeholder?
- How can you use the result of multiplying by 100 to help you multiply a number by 1,000?
- What direction do the digits move when you divide by 10/100/1000?
- How many places to the right do digits move when you divide by 10/100/1000?
- How is dividing by 10, 100 or 1000 linked to multiplying by 10, 100 or 1000?
- How can you use the result of dividing by 100 to help you divide a number by 1000?
- What does inverse mean?

Stem Sentences:

- _____ multiplied by 10/100/1000 is equal to _____.
- _____ is 10/100/1000 times the size of _____.
- There were _____ ones/tens. Now there are _____ tens/hundreds.
- Multiplying by 100 is the same as multiplying by _____ twice.
- _____ divided by 10/100/1000 is equal to _____.
- _____ is one-tenth/one-hundredth/one-thousandth the size of _____.
- There were _____ tens/hundreds. Now there are _____ ones/tens.

Key Vocabulary:

multiplying
whole number
ten
hundred
thousand
place value
Gattegno
digits
rows/columns
twice
three times
10 times the size
100 times the size
1000 times the size
dividing
direction
digits
placeholder
one-tenth the size
one-hundredth the size
one-thousandth the size
inverse
operations

Maths – Multiplication and Division A

YEAR 5

Small Steps:

1. Multiples.
2. Common multiples.
3. Factors.
4. Common factors.
5. Prime numbers.
6. Square numbers.
7. Cube numbers.
8. Multiply 10, 100 and 1000.
9. Divide by 10, 100 and 1,000.
10. Multiples of 10, 100 and 1,000.

Here are two methods to work out 24 × 20

Method 1

24 × 10 × 2
= 240 × 2
= 480

Method 2

24 × 2 × 10
= 48 × 10
= 480

What is the same and what is different about the two methods?

Work out the multiplications.

Find a number for each clue.

- a multiple of 30 that is between 100 and 200
- a multiple of 40 that is between 300 and 400
- a multiple of 500 that is between 4,000 and 5,000

Which is the correct way to work out 800 ÷ 25?

A

800 ÷ 100 = 8
8 ÷ 4 = 2

B

800 ÷ 100 = 8
8 × 4 = 32

Explain your answer.

Tiny is working out 600 ÷ 25

Here are Tiny's workings.

600 ÷ 25
600 ÷ 2 = 300
300 ÷ 5 = 60
600 ÷ 25 = 60

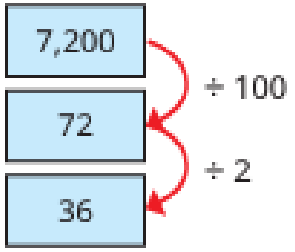
Explain why Tiny is incorrect.

Find the correct answer.

Key Questions:

- Will multiplying/dividing by 20 give an answer that is less than or greater than multiplying/dividing by 10? Why?
- How can your break down multiplying/dividing by ____ into steps using powers of 10?
- What is the same and what is different about the two calculations?
- How can you use inverse operations to find related calculations?
- When do numbers have common multiples that are lower than their product?

The diagram shows that 7,200 ÷ 200 = 36



Stem Sentences:

- ____ = ____ x ____, so to multiply by ____ you can first multiply by ___ and then by ____.
- ____ = ____ x ____, so to divide by ____ you can first divide by ____ and then by ____.

Key Vocabulary:

multiply
divide
multiples
ten
hundred
thousand
factors
calculation
commutative law
order
times-tables
powers of 10
less than
greater than
inverse
operations
product

Maths – Fractions A

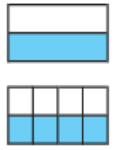
YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
9. Add and subtract fractions with the same denominator.
10. Add fractions within 1.
11. Add fractions with total greater than 1.
12. Add to a mixed number.
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

Take two pieces of paper that are the same size.

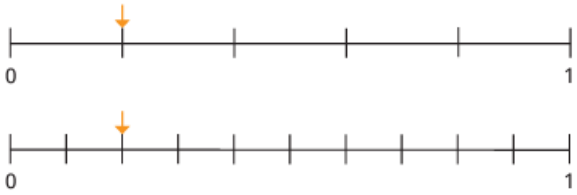
Fold one piece into 2 equal parts and the other piece into 8 equal parts.



Explain how the pieces of paper show that $\frac{1}{2} = \frac{4}{8}$

Use more pieces of paper to find other fractions equivalent to one half.

How do the number lines show that $\frac{1}{5}$ is equivalent to $\frac{2}{10}$?



Use the bar model to complete the equivalent fractions.

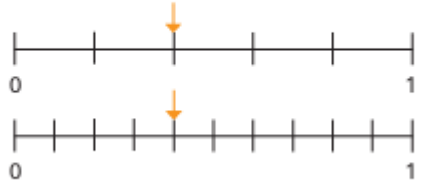
$\frac{2}{6} = \frac{\square}{12}$ $\frac{3}{6} = \frac{\square}{12}$ $\frac{4}{6} = \frac{\square}{12}$ $\frac{5}{6} = \frac{\square}{12}$ $\frac{6}{6} = \frac{\square}{12}$

$\times 7 \; \frac{1}{7} = \frac{4}{28} \; \times 7 \qquad \div 5 \; \frac{3}{15} = \frac{1}{5} \; \div 5$

Key Questions:

- What does "equivalent" mean?
- What is a unit fraction?
- When are two fractions equivalent?
- How can you use the model/diagram to see if the two fractions are equivalent?
- How do you use a fraction wall to find equivalent fractions?
- What multiplication/division facts can you use?
- How can you use your knowledge about unit-fractions to help with non-unit fractions?

How do the number lines show that $\frac{2}{5}$ is equivalent to $\frac{4}{10}$?



Stem Sentences:

- A fraction is a unit fraction if the ____ is equal to _____.
- The numerator has been multiplied/divided by _____ , so if the denominator is multiplied/divided by ____, then the fractions will be equivalent.
- The denominator is ____ times the numerator in both fractions, so the fractions are ____.
- I know that ____ is equivalent to ___ because …

Key Vocabulary:

equivalent
fractions
unit fractions
number line
fraction wall
times-table
numerators
denominators
horizontally/vertically
multiplication
division
non-unit fraction
add
subtract

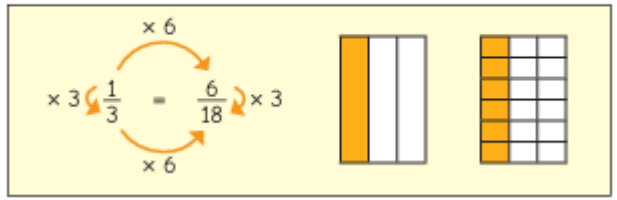
Maths – Fractions A

YEAR 5

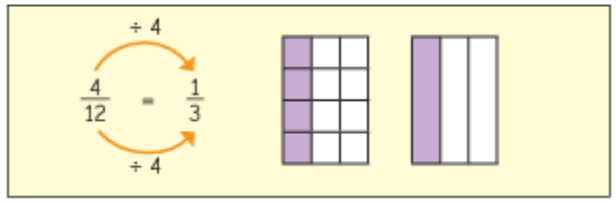
Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
9. Add and subtract fractions with the same denominator.
10. Add fractions within 1.
11. Add fractions with total greater than 1.
12. Add to a mixed number.
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

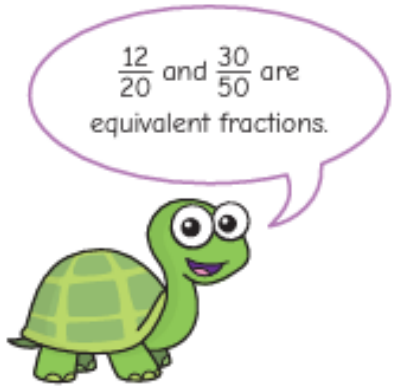
Alex has shown that $\frac{1}{3}$ is equivalent to $\frac{6}{18}$



Mo has shown that $\frac{4}{12}$ is equivalent to $\frac{1}{3}$



Tiny is working out equivalent fractions.



Show that Tiny is correct.

Key Questions:

- What does "equivalent" mean?
- When are two fractions equivalent?
- How can you use a fraction wall to check if the fractions are equivalent?
- What are the common factors of the numerator and denominator?
- Are there any other factors you could use?
- What is the relationship between the numerator and the denominator of the fractions?

Use the number cards to complete the equivalent fractions.

2	15	10	3

$\frac{4}{6} = \frac{\square}{\square} = \frac{\square}{\square}$

Are the fractions equivalent?

$\frac{30}{40}$ $\frac{36}{48}$

Explain your answer.

Key Vocabulary:

equivalent
fractions
common factors
multiples
numerator
denominator
multiplicative relationship
simplifying
fraction wall
divide
multiply

Stem Sentences:

- ____ is a common factor of the numerator and the denominator, so I can divide both of these by ____ to find an equivalent fraction.
- The numerator/denominator has been multiplied by ____, so the denominator/numerator should also be ____ by ____.

Maths – Fractions A

YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
9. Add and subtract fractions with the same denominator.
10. Add fractions within 1.
11. Add fractions with total greater than 1.
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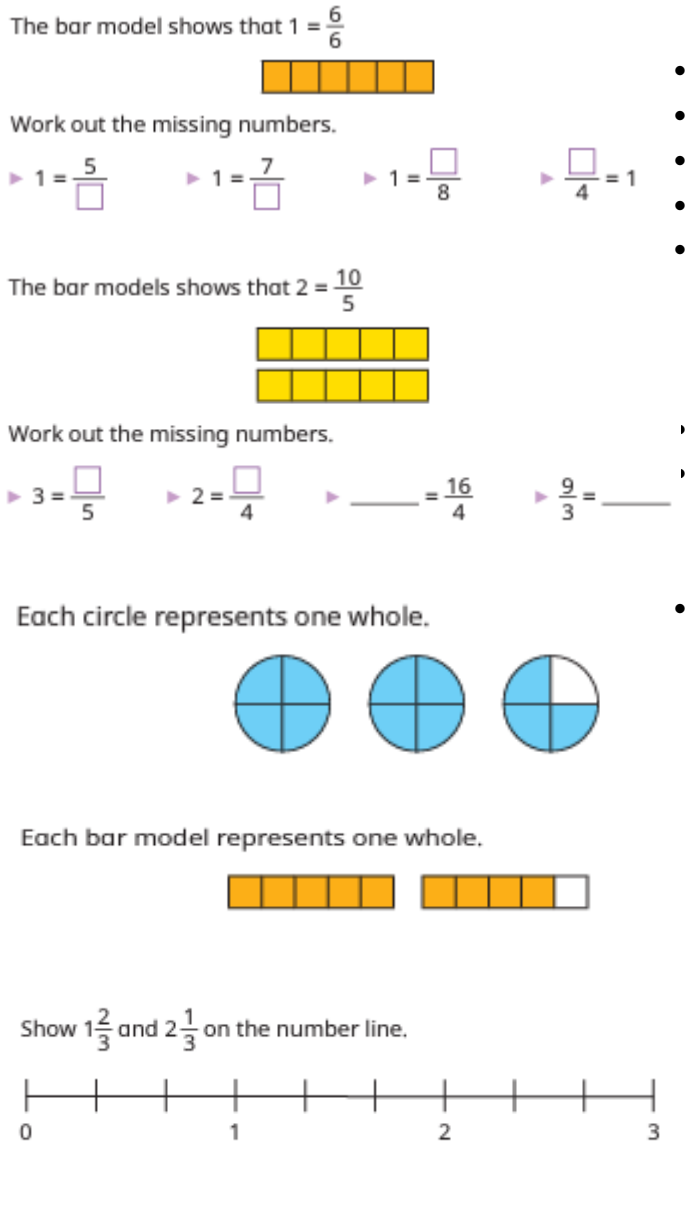
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.



Key Questions:

- How many ___ are there in one whole?
- How many are there in 2/3/4 wholes?
- What does each part of a mixed number represent?
- What is an improper fraction?
- How many cubes do you need to represent the improper fraction? How can you use the cubes to make wholes? What do the remaining cubes represent?
- How many ____ are the in ____ wholes?
- How many ____ are there altogether in the mixed number? How can you write this as an improper fraction?
- How many cubes do you need to represent the mixed number? How many cubes do you need for each whole? How many more cubes do you need? How many cubes do you need altogether?

Key Vocabulary:

improper fraction
numerator
greater
equal
denominator
mixed number
integer
proper fraction
converting
division
remainders
whole
part
regroup
add

Stem Sentences:

- There are ____ in one whole, so there are ____ in ____ wholes.
- I can regroup ____ to make ____ wholes with ____ parts left over. As a mixed number, this is ____ and ____.
- Each whole can be split into ____.
- The wholes are equal to ____ altogether.
- There are another ____ so the mixed number is ____ as an improper fraction.

Maths – Fractions A

YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
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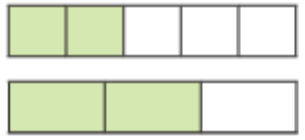
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

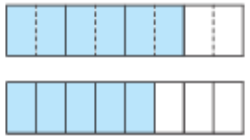
Use the bar models to compare the fractions.



$\frac{2}{5}$ ◯ $\frac{2}{3}$

$\frac{2}{3}$ ◯ $\frac{2}{5}$

Tommy uses bar models and equivalent fractions to compare $\frac{3}{4}$ and $\frac{5}{8}$



Which is the greater fraction, $\frac{3}{4}$ or $\frac{5}{8}$?

How do you know?

Write <, > or = to compare the fractions.

$\frac{7}{8}$ ◯ $\frac{3}{4}$

$\frac{6}{14}$ ◯ $\frac{3}{7}$

$\frac{9}{10}$ ◯ $\frac{9}{100}$

$\frac{1}{4}$ ◯ $\frac{1}{40}$

$\frac{5}{9}$ ◯ $\frac{9}{9}$

$\frac{1}{5}$ ◯ $\frac{5}{20}$

Order each set of fractions, from smallest to greatest.

$\frac{1}{5}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{10}$	$\frac{1}{7}$	$\frac{1}{3}$	$\frac{1}{9}$
$\frac{7}{9}$	$\frac{5}{9}$	$\frac{1}{3}$	$\frac{1}{9}$	$\frac{2}{9}$	$\frac{6}{9}$	$\frac{9}{9}$
$\frac{9}{20}$	$\frac{9}{10}$	$\frac{9}{100}$	$\frac{9}{1000}$	$\frac{9}{15}$	$\frac{9}{40}$	

Key Questions:

- If two fractions have the same denominator/numerator, how can you decide which is greater?
- How can you use equivalent fractions to help?
- How can you use a diagram to find equivalent fractions? Do the bars need to be the same size?
- If a set of fractions all have the same denominator, how can you tell which is greatest?
- How can you use equivalent fractions to help?
- What are all the denominators/numerators multiples of? How can this help you find equivalent fractions?
- Which of the fractions are greater than ½?

Fill in the boxes to make the statement true.

$$\frac{3}{8} < \frac{\square}{\square} < \frac{3}{4}$$

Complete the statement in two different ways.

Key Vocabulary:

equivalent
fractions
compare
denominators
same
multiple
numerator
position
one-half
larger
greater
smaller
less than
equal
fraction wall
bar model
ordering
converting/conversions
compare

Stem Sentences:

- _____ is greater than one half, and _____ is less than one half, so _____ is greater than _____.
- When two fractions have the same denominator, the one with the _____ numerator is the greater fraction.
- When two fractions have the same numerator, the one with the _____ denominator is the greater fraction.

Maths – Fractions A

YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
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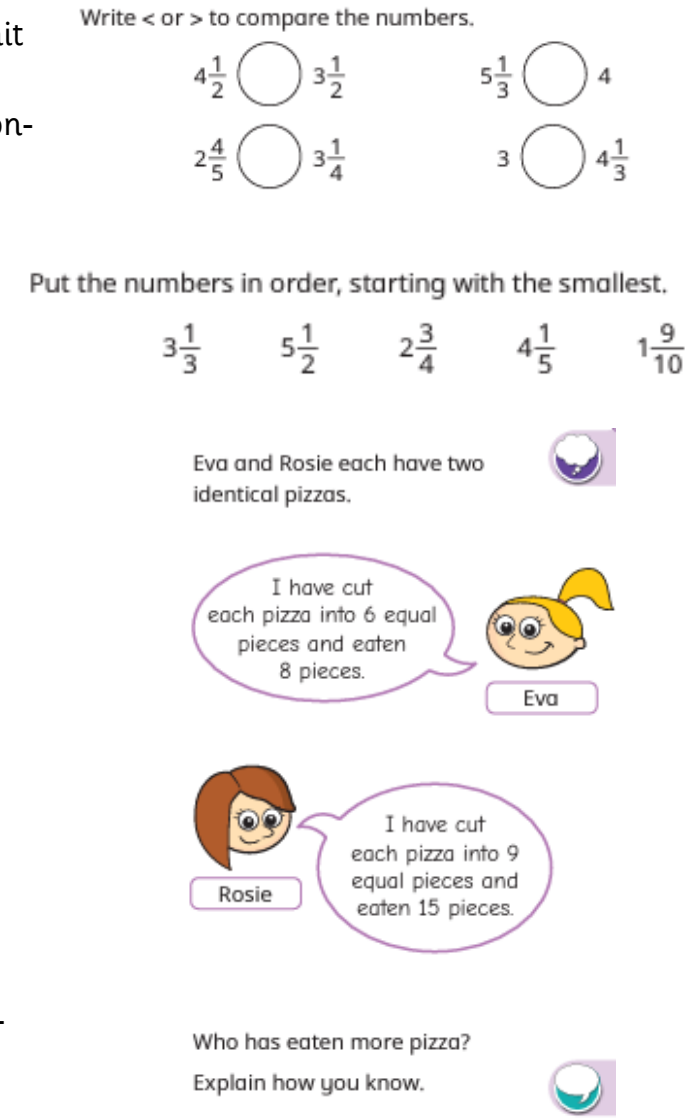
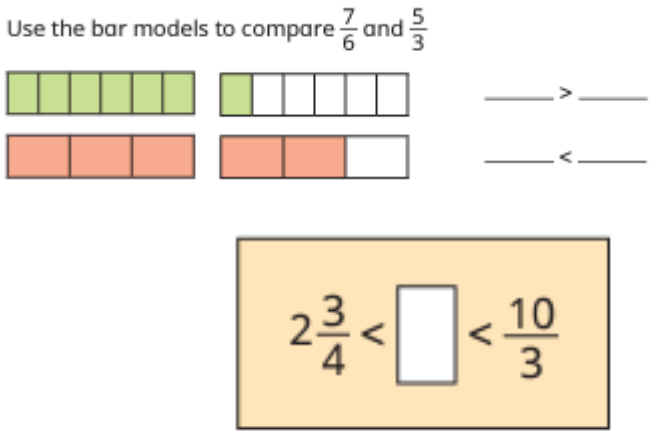
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.



Key Questions:

- How can you represent the fractions?
- What does the number of wholes tell you about the overall sizes of the numbers?
- Do you need to make any conversions?
- How do you convert from an improper fraction/mixed number to a mixed number/improper fraction?
- How can you use your knowledge of multiples to help?



Stem Sentences:

- If the number of wholes is different, then the number with ____ wholes is greater.
- If the number of wholes is equal, then I need to compare the ____.

Key Vocabulary:

converting
compare
order
fractions
greater
wholes
different
fractional parts
equal
denominators
numerators
multiple
conversions
improper fraction
mixed number

Maths – Fractions A

YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
9. Add and subtract fractions with the same denominator.
10. Add fractions within 1.
11. Add fractions with total greater than 1.
12. Add to a mixed number.
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

Use the bar model to complete the calculation.

$\frac{1}{5} + \frac{2}{5} =$ _____

Use the bar model to help you work out $\frac{9}{5} - \frac{6}{5}$

Work out the missing numbers.

- $\frac{3}{7} + \frac{\square}{7} = \frac{9}{7}$
- $\frac{3}{11} + \frac{\square}{11} = \frac{15}{11}$
- $\frac{15}{8} - \frac{\square}{8} = 1$
- $\frac{\square}{5} - \frac{3}{5} = \frac{4}{5}$
- $\frac{4}{5} + \frac{\square}{5} = 2$
- $\frac{10}{3} - \frac{\square}{3} = 2$

A chocolate bar has 12 equal pieces.

- Amir eats $\frac{5}{12}$ more of the bar than Whitney.
- There is $\frac{1}{12}$ of the bar left.

What fraction of the bar does Amir eat?

What fraction of the bar does Whitney eat?

Key Questions:

- How can you represent this calculation using a bar model?
- Will you need more than one bar? How do you know?
- How many parts do you split the bar (s) into?
- What could you do if the answer is an improper fraction?
- What type of calculation is this?
- When adding/subtracting fractions with the same denominators, what will the denominator of the answer be? Why?

A flag is made from different-coloured parts.

- $\frac{2}{15}$ of the flag is blue.
- $\frac{7}{15}$ of the flag is red.
- $\frac{1}{15}$ of the flag is green.

- What fraction of the flag is blue, red or green?

The rest of the flag is white.

- What fraction of the flag is white?

Stem Sentences:

- _____ fifths add/subtract _____ fifths is _____ fifths.
- When adding/subtracting fractions with the same denominators, I just add/subtract the _____.

Key Vocabulary:

add
subtract
denominator
pairs
numerators
bar model
improper fractions
simplified
calculation
parts
whole

Maths – Fractions A

YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
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7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
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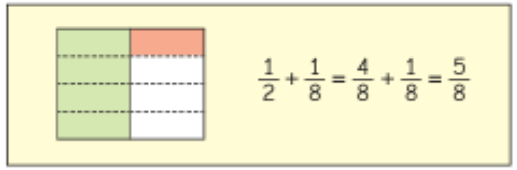
10. Add fractions within 1.
11. Add fractions with total greater than 1.
12. Add to a mixed number.
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

Scott is working out $\frac{1}{2}+\frac{1}{8}$

He uses a diagram to represent the sum.

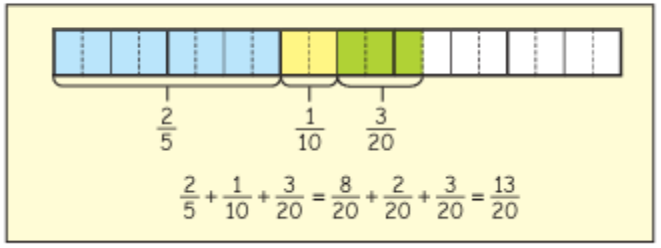


Rosie uses a bar model to work out $\frac{1}{4}+\frac{3}{8}$

What common denominator would you use to work out each addition?

$\frac{1}{2}+\frac{1}{6}$ $\frac{1}{4}+\frac{5}{8}$ $\frac{3}{10}+\frac{2}{5}$ $\frac{1}{6}+\frac{1}{3}$

Nijah uses a bar model to work out $\frac{2}{5}+\frac{1}{10}+\frac{3}{20}$



Key Questions:

- Do the fractions have the same denominator?
- What does it mean for two fractions to be equivalent?
- How can you tell when two fractions are equivalent?
- Why do the denominators need to be the same?
- How can you find a common denominator?
- How many of the fractions do you need to convert?
- Now the denominators are the same, how do you add the fractions?

Work out the missing numbers.

$\frac{5}{16}+\frac{\square}{8}=\frac{15}{16}$

$\frac{\square}{20}+\frac{7}{10}=\frac{17}{20}$

Tommy adds three fractions with different denominators.

What three fractions could he have added?

Key Vocabulary:

add
denominators
multiple
total
within 1
convert
common denominator
equivalent
same
multiplied

Stem Sentences:

- Fractions must have the same ___ before you can add them.
- The denominator has been multiplied by ____, so the numerator needs to be multiplied by ____ for the fractions to be equivalent.

Maths – Fractions A

YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
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10. Add fractions within 1.
11. Add fractions with total greater than 1.
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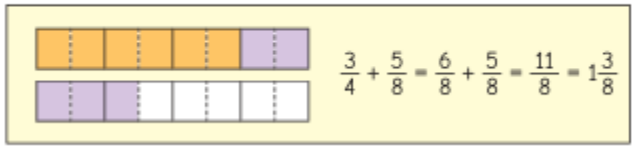
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

Dora uses a bar model to add $\frac{3}{4}$ and $\frac{5}{8}$

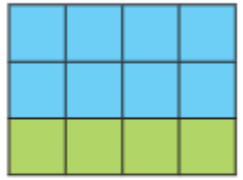


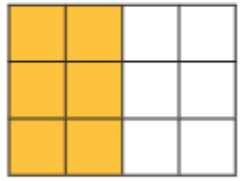
$\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$

Here is Mo's method for adding three fractions with different denominators.

$\frac{1}{3} + \frac{5}{6} + \frac{5}{12} = 1\frac{7}{12}$

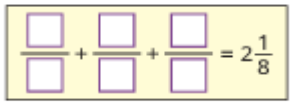
Kim uses the diagram to add three fractions.





What could her fractions be?

How many different combinations can you find?



$\square + \square + \square = 2\frac{1}{8}$

The sum of three fractions is $2\frac{1}{8}$

Use the clues to work out the three fractions.

- All the fractions have different denominators.
- None of the fractions are smaller than one half.
- None of the fractions are improper.
- All three denominators are factors of 8

Key Questions:

- Do the fractions have the same denominator?
- How can you find a common denominator?
- How many of the fractions do you need to convert?
- Now the denominators are the same, how do you add the fractions?
- How can you tell the answer is greater than one whole?
- How can you convert the answer to a mixed number?

Work out the missing numbers.

- $\frac{7}{10} + \frac{\square}{5} = 1\frac{3}{10}$
- $\frac{3}{4} + \frac{7}{8} + \frac{\square}{8} = 2$
- $3\frac{1}{12} = \frac{\square}{12} + \frac{2}{3} + \frac{5}{6}$

Key Vocabulary:

add
fractions
denominator
common denominator
multiple
greater
improper fractions
convert
mixed number
whole
part
regroup
left over

Stem Sentences:

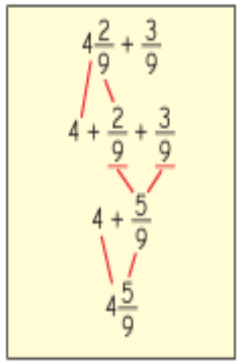
- I am going to make all of the denominators ____.
- I can regroup ____ to make ____ wholes with _____ parts left over. As a mixed number, this is ____ and ____.

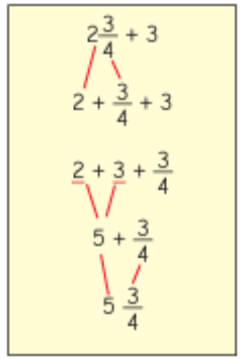
Maths – Fractions A

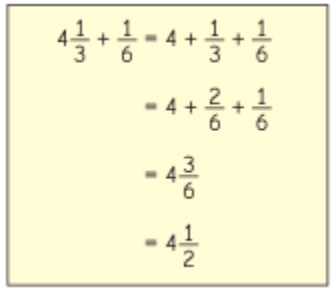
YEAR 5

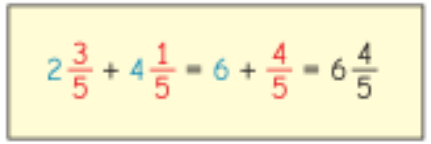
Small Steps:

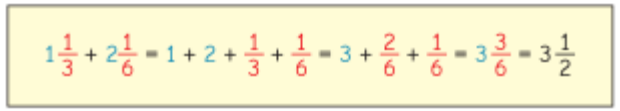
1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
9. Add and subtract fractions with the same denominator.
10. Add fractions within 1.
11. Add fractions with total greater than 1.
12. Add to a mixed number.
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

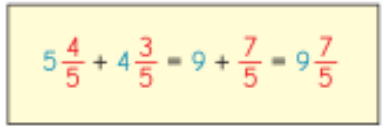






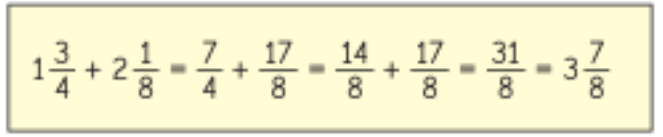






Key Questions:

- How can you partition a mixed number?
- How can the addition be written so that similar parts are next to each other?
- How can the parts be combined to produce a mixed number?
- Do you need to combine whole numbers or fractions?
- Why can you swap the order of the numbers in an addition?
- Are there any improper fractions in the answer? What can you do about this?
- How do you change a mixed number into an improper fraction?
- In this questions, is it easier to deal with mixed numbers or to use improper fractions? Why?



Stem Sentences:

- A mixed number can be partitioned into a _____ part and a _____part.
- The fractional part of the answer is an _____, so need converting to a _____.
- The mixed numbers can be partitioned into a _____ part and a _____ part.

Key Vocabulary:

add
whole number
part
fractional part
mixed number
partitioned
recombining
sum
cross a whole
combined
produce
fractions
order
converting
separately
efficient
improper fractions
equivalent
simplified
denominators
multi-step

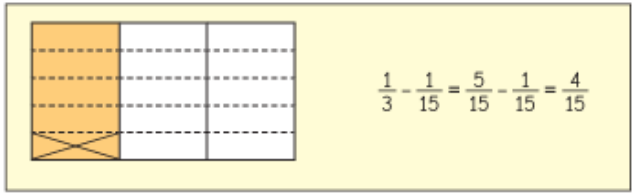
Maths – Fractions A

YEAR 5

Small Steps:

1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
9. Add and subtract fractions with the same denominator.
10. Add fractions within 1.
11. Add fractions with total greater than 1.
12. Add to a mixed number.
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

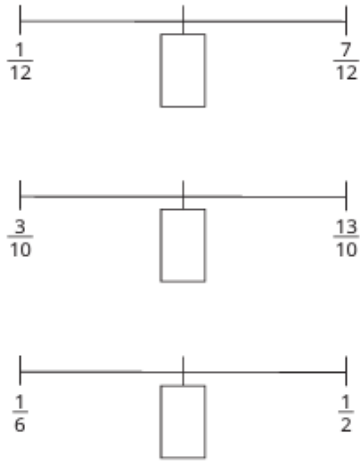
Eva is working out $\frac{1}{3} - \frac{1}{15}$



$\frac{1}{3} - \frac{1}{15} = \frac{5}{15} - \frac{1}{15} = \frac{4}{15}$

The number line shows that $\frac{2}{3} - \frac{2}{9} = \frac{4}{9}$

Find the value of the midpoint of each number line.



Key Questions:

- Do the fractions have the same denominator?
- When are two fractions equivalent?
- How can you find a common denominator?
- How many of the fractions do you need to convert?
- Now the denominators are the same, how do you subtract the fractions?
- How can you represent the problem using a diagram?

Subtract each fraction from one whole.

$\frac{3}{5}$	$\frac{4}{7}$	$\frac{5}{12}$
$\frac{2}{9}$	$\frac{3}{4}$	$\frac{5}{8}$

What connections can you see between the fractions and your answers?

Stem Sentences:

- Fractions must have the same ____ before they can be subtracted.
- The denominator has been multiplied by ____, so the numerator needs to be multiplied by ____ for the fractions to be equivalent.

Key Vocabulary:

subtraction
denominators
multiple
adding
proper fractions
improper fractions
partitioning
reduction
difference
bar model
number line
equivalent
convert
fractions
multiplied
numerator

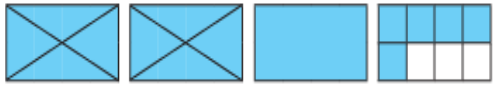
Maths – Fractions A

YEAR 5

Small Steps:

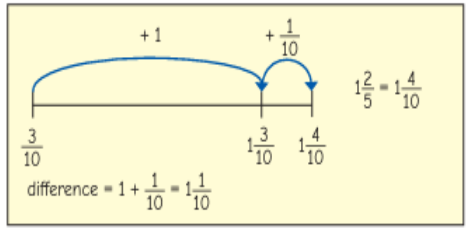
1. Find fractions equivalent to a unit fraction.
2. Find fractions equivalent to a non-unit fraction.
3. Recognise equivalent fractions.
4. Convert improper fractions to mixed numbers.
5. Convert mixed numbers to improper fractions.
6. Compare fractions less than 1.
7. Order fractions less than 1.
8. Compare and order fractions greater than 1.
9. Add and subtract fractions with the same denominator.
10. Add fractions within 1.
11. Add fractions with total greater than 1.
12. Add to a mixed number.
13. Add two mixed numbers.
14. Subtract fractions.
15. Subtract from a mixed number.
16. Subtract from a mixed number – breaking the whole.
17. Subtract two mixed numbers.

Explain how the diagram shows $3\frac{5}{8} - 2 = 1\frac{5}{8}$

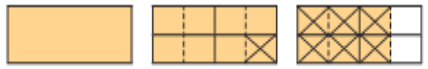


What calculation does this diagram show?

Kim uses a number line to find the difference between $1\frac{2}{5}$ and $\frac{3}{10}$



Here is a method for working out $2\frac{3}{4} - \frac{7}{8}$



The diagram illustrates $6\frac{4}{5} - 2\frac{3}{5}$

Key Questions:

- How can you partition a mixed number?
- Can the subtraction be written in a different form to make it easier?
- If the denominators are different, what do you need to do?
- How can the parts be combined to produce a mixed number?
- Do you need to combine whole numbers or fractions?
- Can you change the order of the numbers in a subtraction?
- Which fraction is greater?
- How can you show the calculation as a diagram/on a number line?
- How can you partition the mixed number? Is there more than one way?
- Is it easier to partition or to convert the mixed number to an improper fraction?
- Is it possible to subtract the whole parts and fractional parts separately? Why or why not?
- Will you need to "break the whole"? Why or why not?
- Does making the whole number greater make the calculation more difficult? Why or why not?

Stem Sentences:

- A mixed number can be partitioned into a ____ part and a ___ part.
- The difference between the wholes is ____.
- The difference between the fractions is ____.
- ____ can be partitioned into ____ and ____ or ____ and ____.
- There are ____ in one whole, so there are ____ in _____.
- When breaking the whole, the first number can be partitioned into ____ and ____.

Key Vocabulary:

add
mixed number
subtracting
whole number
part
fractional part
equivalent fractions
denominators
multiples
calculation
simplified
Flexible/partition
combined
produce
order
difference
fraction
crossing the whole
break the whole
equal
number line
convert

Maths – Fractions B

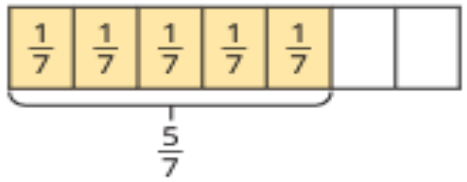
YEAR 5

Small Steps:

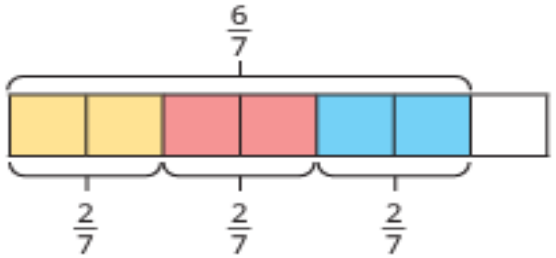
1. Multiply a unit fraction by an integer.
2. Multiply a non-unit fraction by an integer.
3. Multiply a mixed number by an integer.
4. Calculate a fraction of a quantity.
5. Fraction of an amount.
6. Find the whole.
7. Use fractions as operators.

Ron uses bar models to work out $\frac{1}{6} \times 4 = \frac{4}{6}$

Alex uses a bar model to work out $5 \times \frac{1}{7} = \frac{5}{7}$



Brett uses a bar model to work out $3 \times \frac{2}{7} = \frac{6}{7}$

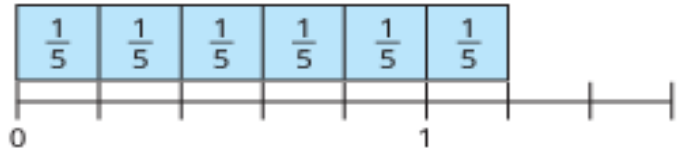


Dani uses bar models to work out $\frac{2}{7} \times 5 = \frac{10}{7} = 1\frac{3}{7}$

Key Questions:

- How can you write this multiplication as a repeated addition? How does this help you to work it out?
- How can you represent this question as a bar model?
- When you multiply a fraction by an integer, what happens to the numerator? What happens to the denominator?
- What is your answer as a mixed number?
- What is it as an improper fraction?
- What happens if the integer you are multiplying by is the same as the denominator? Does this always happen?

Filip uses a number line to work out $\frac{1}{5} \times 6 = \frac{6}{5} = 1\frac{1}{5}$



Stem Sentences:

- $\frac{1}{\square} \times \_\_\_\_ = \frac{1}{\square} + \ldots + \frac{1}{\square}$
- $\frac{\square}{\square} \times \_\_\_\_ = \frac{\square}{\square} + \ldots + \frac{\square}{\square}$
- To multiply a fraction by an integer, I multiply the _____ by the integer and the _____ remains the same.

Key Vocabulary:

multiplication
fractions
unit fractions
integer
repeated addition
numerator
denominator
bar models
greater than 1
mixed number
number line
improper fraction
Same
non-unit fractions
calculations
convert

Maths – Fractions B

YEAR 5

Small Steps:

1. Multiply a unit fraction by an integer.
2. Multiply a non-unit fraction by an integer.
3. Multiply a mixed number by an integer.
4. Calculate a fraction of a quantity.
5. Fraction of an amount.
6. Find the whole.
7. Use fractions as operators.

Rosie is working out $1\frac{1}{5} \times 3$

I know that $1\frac{1}{5} \times 3 = 1\frac{1}{5} + 1\frac{1}{5} + 1\frac{1}{5} = 3\frac{3}{5}$

Amir is working out $3 \times 5\frac{1}{10}$

I will partition $5\frac{1}{10}$ into 5 and $\frac{1}{10}$ and multiply each part by 3

$3 \times 5 = 15$ $\quad 3 \times \frac{1}{10} = \frac{3}{10}$ $\quad 3 \times 5\frac{1}{10} = 15\frac{3}{10}$

Whitney is working out $3 \times 2\frac{2}{5}$ by partitioning the mixed number into a whole number and a fraction.

$3 \times 2 = 6$

$3 \times \frac{2}{5} = \frac{6}{5} = 1\frac{1}{5}$

$3 \times 2\frac{2}{5} = 6 + 1\frac{1}{5} = 7\frac{1}{5}$

Find the missing numbers.

$2\frac{\square}{8} \times \square = 7\frac{7}{8}$

Explain how you worked out the missing numbers.

Scott uses improper fractions to work out $4 \times 1\frac{3}{8} = 5\frac{1}{2}$

$4 \times 1\frac{3}{8} = 4 \times \frac{11}{8} = \frac{44}{8} = 5\frac{4}{8} = 5\frac{1}{2}$

Key Questions:

- How could you partition this mixed number?
- When you multiply a fraction, what happens to the numerator? What happens to the denominator?
- What do you need to do if you have an improper fraction in your answer?
- Could you work it out another way? Which way is more efficient?
- Have you written your answer in its simplest form?

Jack runs $2\frac{2}{3}$ miles three times per week.

Mo runs $3\frac{3}{4}$ miles twice a week.

Who runs further during the week?

Explain your answer.

Stem Sentences:

- I can partition $\square$ $\frac{\square}{\square}$ into $\square$ and $\frac{\square}{\square}$
- When I multiply a fraction by an integer, I multiply the _____ by the integer and the _____ remains the same.
- To multiply a mixed number by an integer, I multiply the _____ by the integer and the _____ by the integer.

Key Vocabulary:

multiply
mixed numbers
integers
proper fractions
efficiency
methods
convert
fractional part
greater than 1
combining
totals
partition
numerator
denominator
simplest form

Maths – Fractions B

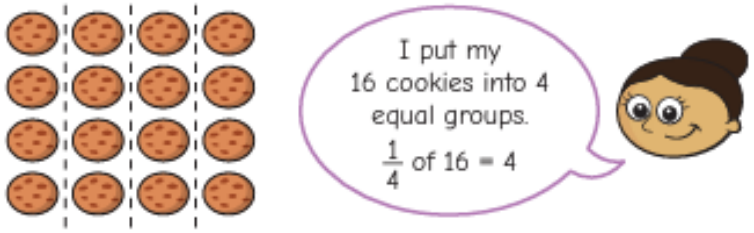
YEAR 5

Small Steps:

1. Multiply a unit fraction by an integer.
2. Multiply a non-unit fraction by an integer.
3. Multiply a mixed number by an integer.
4. Calculate a fraction of a quantity.
5. Fraction of an amount.
6. Find the whole.
7. Use fractions as operators.

Dora is sharing 16 cookies between 4 friends.

She needs to find $\frac{1}{4}$ of 16



The bar model shows 20 counters shared equally into 5 groups.

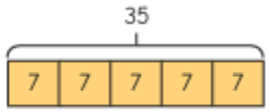
Use the bar model to find the fractions of amounts.

▸ $\frac{1}{5}$ of 20 ▸ $\frac{2}{5}$ of 20 ▸ $\frac{3}{5}$ of 20 ▸ $\frac{4}{5}$ of 20 ▸ $\frac{5}{5}$ of 20

$\frac{1}{3}$ of 33 ◯ $\frac{2}{5}$ of 25

$\frac{2}{7}$ of 140 ◯ $\frac{3}{4}$ of 76

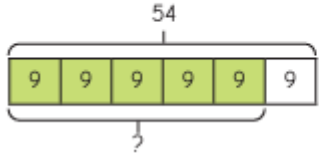
Esther is finding $\frac{1}{5}$ of 35



35 ÷ 5 = 7

$\frac{1}{5}$ of 35 = 7

Mo is finding $\frac{5}{6}$ of 54



54 ÷ 6 = 9

9 × 5 = 45

$\frac{5}{6}$ of 54 = 45

Key Questions:

- How can you share the counters equally?
- How do you know the counters are in equal groups?
- If you know $\frac{1}{\square}$ of a number, how do you find $\frac{2}{\square}$ of the number?
- What do you need to do when you cannot share your tens counters equally?
- How do you find a fraction of an amount?
- How can you represent this in a bar model?
- What is the relationship between $\frac{1}{\square}$ of a number and $\frac{2}{\square}$ of a number?
- What is the first step to solve this calculation?
- What is the next step to solve this calculation?
- How can you find a fraction of a 3-digit number?

Stem Sentences:

- If I know $\frac{1}{\square}$ of a quantity , then to find $\frac{\square}{\square}$ I need to multiply by _____.
- To find ¾ of _____, I need to divide by ____ and multiply by ____.
- I need to divide by the ____ and multiply by the _____.
- To find $\frac{\square}{\square}$ of _____, I need to divide by _____ and multiply by _____.
- To find a fraction of an amount, I need to divide by the ____ and multiply the result by the _____.

Key Vocabulary:

fraction
quantity
sharing
equal groups
dividing
denominator
multiplying
numerator
unit fractions
amounts
non-unit fractions
share
equally
tens
bar models
times-tables
calculations
fractional part

Maths – Fractions B

YEAR 5

Small Steps:

1. Multiply a unit fraction by an integer.
2. Multiply a non-unit fraction by an integer.
3. Multiply a mixed number by an integer.
4. Calculate a fraction of a quantity.
5. Fraction of an amount.
6. Find the whole.
7. Use fractions as operators.

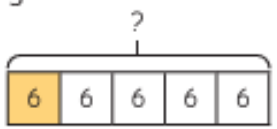
The counters in the bar model show that $\frac{1}{4}$ of a quantity is 5

Use the bar model to work out the fractions of the same quantity.

- $\frac{2}{4}$ = _____
- $\frac{3}{4}$ = _____
- $\frac{4}{4}$ or 1 whole = _____

Eva uses a bar model to help work out the missing amount.

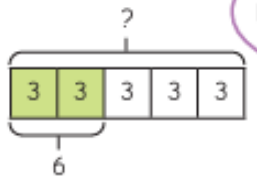
$\frac{1}{5}$ of _____ = 6

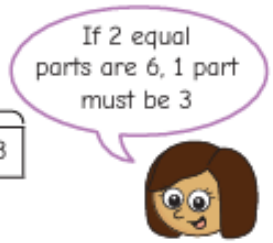


$6 \times 5 = 30$ $\frac{1}{5}$ of $30 = 6$

Kim uses a bar model to help work out the missing amount.

$\frac{2}{5}$ of _____ = 6





$6 \div 2 = 3$
$3 \times 5 = 15$
$\frac{2}{5}$ of $15 = 6$

Key Questions:

- What is the same and what is different about finding a fraction of an amount and finding the whole?
- If you know that one equal part is ____, what must all the other parts be?
- If you know one equal part, how can you work out the whole?
- If you know what ____ equal parts are, how can you find what one part is?
- If your answer going to be greater or less than ____? How do you know?

If $\frac{1}{8}$ of A = 12, find the values of A, B and C.

$\frac{5}{8}$ of A = $\frac{3}{4}$ of B = $\frac{1}{6}$ of C

Rosie takes a bottle of water to school with her.

She drinks $\frac{1}{3}$ of the water in the morning.

She drinks $\frac{1}{4}$ of the bottle at lunchtime.

So far, she has drunk 210 ml of water.

How much water was in her bottle when it was full?

Stem Sentences:

- If ____ is one equal part, all the parts must be ____.
- If $\frac{1}{\square}$ is _____, then the whole is ____ x ____ = _____.
- If _____ is _____ parts, then one part is _____.

Key Vocabulary:

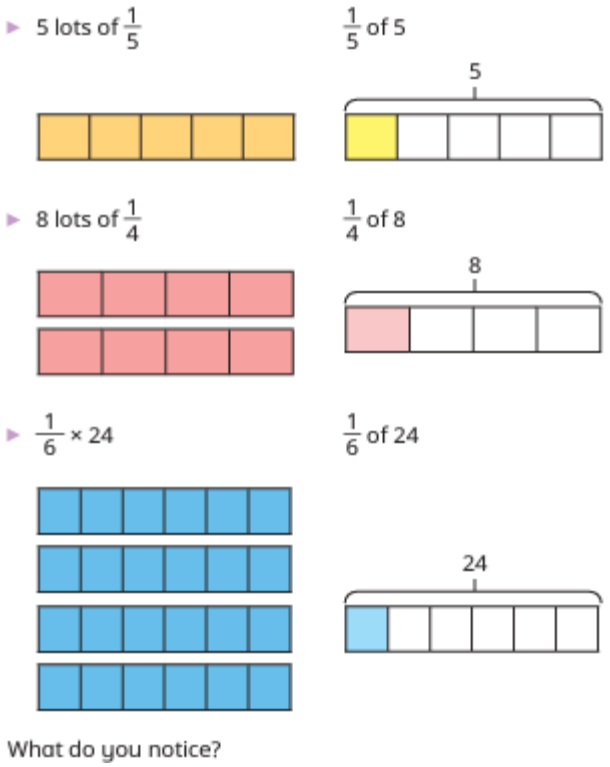
fraction
amount
whole
unit fraction
bar model
equal part
multiplication
non-unit
same/different
greater than/less than

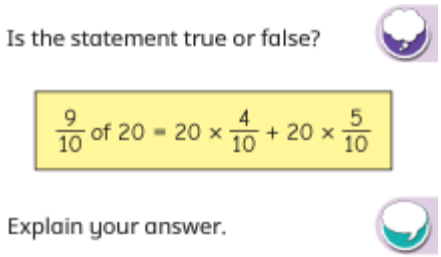
Maths – Fractions B

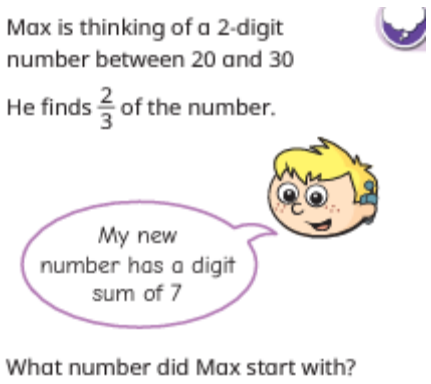
YEAR 5

Small Steps:

1. Multiply a unit fraction by an integer.
2. Multiply a non-unit fraction by an integer.
3. Multiply a mixed number by an integer.
4. Calculate a fraction of a quantity.
5. Fraction of an amount.
6. Find the whole.
7. Use fractions as operators.

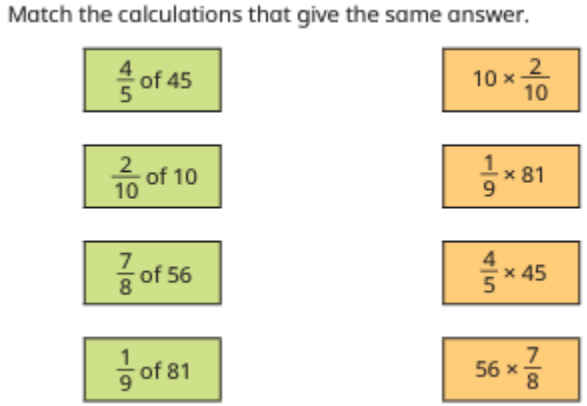






Key Questions:

- What is the same about ____ of ____ and ____ x ____?
- Is the denominator of the fraction a factor of the number you are multiplying by? Why is this important?
- Which is the most efficient method? How do you know?
- How would you write this improper fraction as a whole number/mixed number?
- When is it more efficient to multiply fractions?
- When is it more efficient to find a fraction of an amount?



Stem Sentences:

- $\frac{\square}{\square}$ x _____ is the same as $\frac{\square}{\square}$ of _____.
- _____ is a factor of _____, so I can divide _____ by _____.

Key Vocabulary:

fractions
operators
fraction of an amount
integer
multiply
patterns
converting
improper
whole numbers
mixed numbers
commutativity
efficient
method
factors
same/different
denominator
numerator

Maths – Multiplication and Division B

YEAR 5

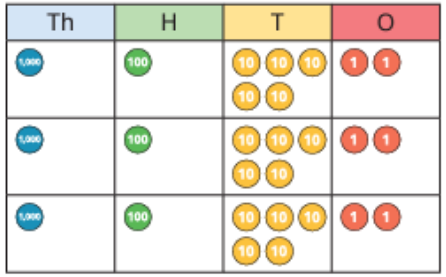
Small Steps:

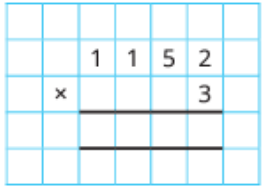
1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

There are 1,152 seats in a cinema.

The cinema is fully booked for three showings of a film.

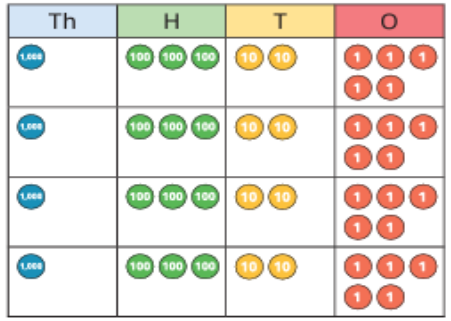
How many people go to the film altogether?

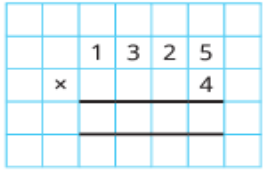




Ms Fisher earns £1,325 per week.

How much does she earn in 4 weeks?





342 × 3 = 1,026

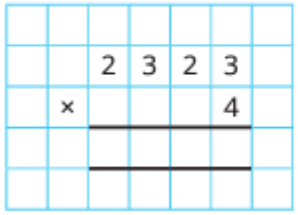
Without calculating, which is greater, 342 × 4 or 343 × 3?

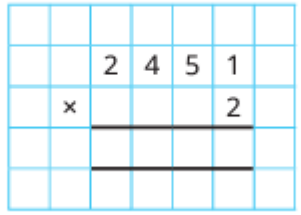
Explain your answer.

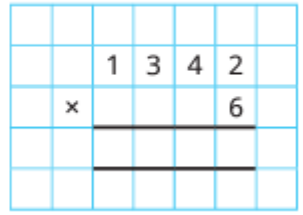
Key Questions:

- How does multiplication link to addition?
- How can you use counters to represent 284 x 3 =?
- How does the written method match the representation?
- Which column do you start with?
- Do you need to make an exchange?
- How could you estimate the answer to check your calculation?
- What is the same and what is different about multiplying a 4-digit number by a 1-digit number and multiplying a 3-digit number by a 1-digit number?

- Complete the calculations.







Stem Sentences:

- _____ ones x _____ = _____ ones + _____ tens.
- _____ tens x _____ = _____ tens + _____ hundreds.
- _____ hundreds x _____ = _____ hundreds + _____ thousands.
- _____ thousands x _____ = _____ thousands + _____ ten-thousands.

Key Vocabulary:

formal written method
multiply
calculation
1-digit
short multiplication
4-digit
place value
exchange
groups
ones
tens
hundreds
thousands
ten-thousands
rounding
multiples
estimates
addition
multiplication
column
same/different
representation

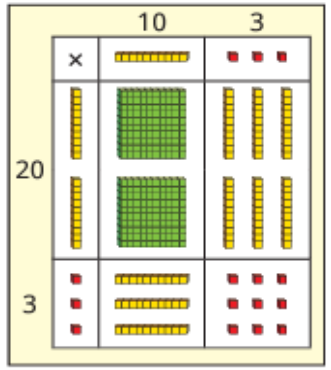
Maths – Multiplication and Division B

YEAR 5

Small Steps:

1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

The base 10 in this area model represents 23 × 13



Complete the sentences.

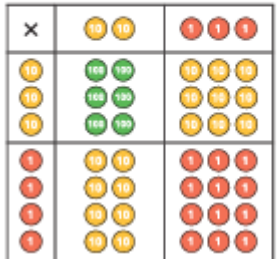
There are _____ hundreds.

There are _____ tens.

There are _____ ones.

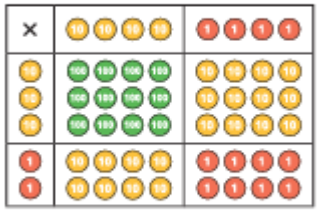
23 × 13 = _____

Aisha uses place value counters and an area model to work out 34 × 23



34 × 23
= 600 + 90 + 80 + 12 = 782

Dexter uses place value counters and an area model to work out 44 × 32

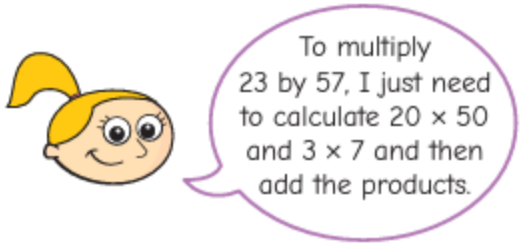


×	40	4
30	1,200	120
2	80	8

44 × 32 = 1,200 + 80 + 120 + 8 = 1,408

Key Questions:

- How can you partition the numbers?
- What other multiplications can you see?
- Which numbers did you multiply first?
- Once you have completed the area model, what do you need to do to find the total product of the two numbers?
- What is the same and what is different about 2 x 3 and 20 x 30?
- Does it matter what order you complete the area model in?



What mistake has Eva made?

Explain your answer.

Stem Sentences:

- _____ ones x _____ = _____ ones, so _____ tens x _____ = _____ tens.
- The products in my area model are _____, _____, _____ and _____, so the total product is _____ + _____ + _____ + _____ = _____.

Key Vocabulary:

multiplying
2-digit
area model
arrays
total product
calculation
add
base 10
size
scale
place value
partition
multiplications
same/different
order

Maths – Multiplication and Division B

YEAR 5

Small Steps:

1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

Annie's method

×	10	3
30	300	90
2	20	6

300 + 90 + 20 + 6 = 416

Tom's method

			3	2	
	×		1	3	
			9	6	(32 × 3)
		3	2	0	(32 × 10)
		4	1	6	
		1			

What is the same and what is different about Annie's and Tom's methods?

Complete the calculation to work out 123 × 23

			1	2	3	
	×			2	3	
			3	6	9	(123 × 3)
		2	4	6	0	(123 × 20)

			2	5	3	4	
	×				2	3	
			7_1	5	9_1	2	
			5_1	0	6	8	
		1	2	6	6	0	
				1	1		

What are the mistakes in this calculation?

Work out the correct answer.

Key Questions:

- What are you multiplying _____ by first?
- What are you multiplying ____ by next? Why is this different?
- Why is there a zero in the ones column when multiplying by ____?
- what do you do after you have multiplied both numbers?
- Where do you write the exchanged ones/tens/hundreds?
- Have you included all the exchanges in your totals?
- How can you use rounding to find an estimate for the answer to the calculation?
- What do you need to do to complete the calculation?
- What is the same and what is different about multiplying a 2-digit number by a 2-digit number and multiplying a 3-digit number by a 2-digit number?

Stem Sentences:

- First, I multiply ____ by ____ones.
- Then I multiply ____ by ____ tens.
- Finally, I add together ____ and _____.

Key Vocabulary:

formal written method
multiplication
subtotals
totals
calculation process
zero placeholder
column
ones/tens/hundreds /thousands
digits
rounding/estimates
exchanged
2-digit/3-digit/4-digit

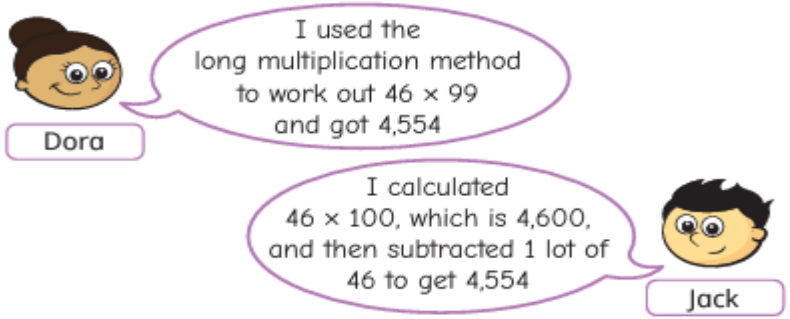
Maths – Multiplication and Division B

YEAR 5

Small Steps:

1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

Dora and Jack have worked out 46 × 99



Explain why both methods work.

1	3	5
6	7	9

Arrange the digit cards in the multiplication.

☐☐☐☐ × ☐☐

What is the greatest product that can be made?

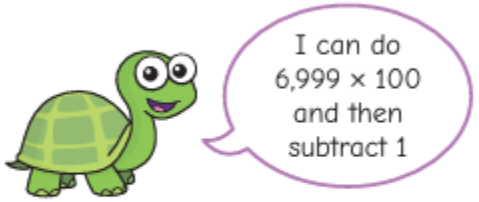
What is the smallest product that can be made?

What is the difference between the greatest and smallest product?

Key Questions:

- What operation do you need to do? How do you know?
- Why can you multiply the numbers in any order?
- What strategy can you use to solve this problem?
- How do the words in the problem tell you what to do?
- Is there a more efficient method?
- What calculation do you need to do? How do you know?
- Could you have worked it out a different way?

Tiny is working out 6,999 × 99



Is Tiny correct?

Explain your answer.

Without calculating, write <, > or = to compare the calculations.

2,470 × 83 ◯ 247 × 830

4,642 × 24 ◯ 4,641 × 25

Explain your reasoning.

Key Vocabulary:

multiplication
solve problems
formal written method
efficient mental strategies
known facts
derive unknown facts
calculate
subtract
…lot of…
commutative
order
operation

Stem Sentences:

- To calculate ____ x 24, I can do ____ x _____ x _____.
- To calculate 9,999 x _____, I can do 10,000 x _____ - _____,
- The most efficient strategy to calculate _____ x _____ is …

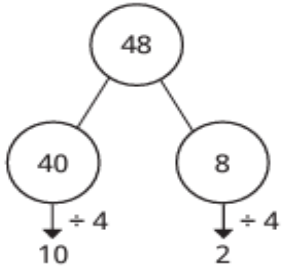
Maths – Multiplication and Division B

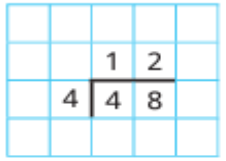
YEAR 5

Small Steps:

1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

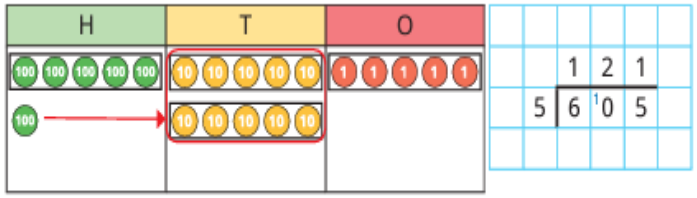
What is the same and what is different about the two methods for dividing 48 by 4?





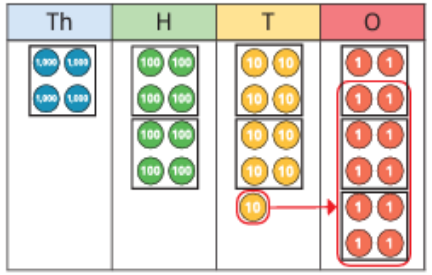
10 + 2 = 12, so 48 ÷ 4 = 12

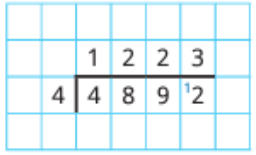
Sam uses a place value chart and counters to work out 605 ÷ 5



Sam exchanges the remaining hundred counter for 10 ten counters.

Ron has worked out 4,892 ÷ 4 using place value counters and short division.





Key Questions:

- Which digit do you divide first?
- How many groups of hundreds/tens/ones are there?
- How can you set out the division using the formal written method?
- When using short division, do you start from the left or the right?
- What do you do if the number you are dividing by does not divide exactly into the first digit?
- When do you need to make an exchange?

Key Vocabulary:

formal written method
short division
part-whole model
place value
3-digit/2-digit/1-digit
exchange
divide
groups of
thousands
hundreds/tens/ones
left/right
equal to
remainder

Stem Sentences:

- _____ hundreds divided by _____ is equal to _____ hundreds with a remainder of _____.
- Exchange the remainder, then _____ tens divided by _____ is equal to _____ tens with a remainder of _____.
- Exchange the remainder, then _____ ones divided by _____ is equal to _____ones.
- To use the formal method of division, I start with the digit on the _____ and work from _____ to _____.
- There are _____ groups of _____ thousands/hundreds/tens/ones in _____ thousands/hundreds/tens/ones.

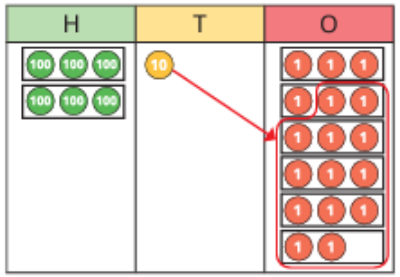
Maths – Multiplication and Division B

YEAR 5

Small Steps:

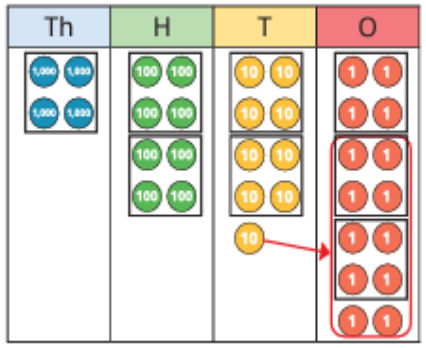
1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

Nijah works out 617 ÷ 3 using place value counters and a place value chart, and then writes the formal method.



		2	0	5	r2	
	3	6	1	¹7		

Scott is is working out 4,894 ÷ 4



		1	2	2	3	r2
	4	4	8	9	¹4	

Find the missing numbers.

		0		6	1	r4
	5		⁴3	0		

Key Questions:

- What does "remainder" mean?
- How can you use your times-tables to know if a division by 2/5 will have a remainder? What other divisibility rules do you know?
- What do you notice about the size of the remainders compared to the number being divided by?
- What is the greatest possible remainder you can get when dividing by ____?
- How do you know this answer is incorrect, just by looking at the size of the remainder?

Is the statement always true, sometimes true or never true?

When a 3-digit number made of consecutive, descending digits is divided by the next digit, the remainder is 1

For example, 765 ÷ 4 = 191 r1

Explain your answer.

Amir is thinking of a 3-digit number that is less than 500

When my number is divided by 9, the remainder is 3. When my number is divided by 2, the remainder is 1. When my number is divided by 5, the remainder is 4

What could Amir's number be?

Stem Sentences:

- ____ ones divided by ____ = _____ ones remainder _____.
- When dividing by _____, the greatest possible remainder is _____.

Key Vocabulary:

division
remainders
formal calculations
formal written method
short division
place value
left over
less than
times-tables
divisibility rules
greatest
ones

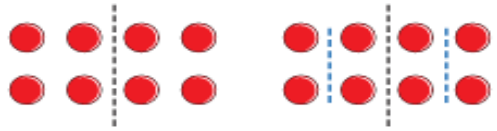
Maths – Multiplication and Division B

YEAR 5

Small Steps:

1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

The array shows that 8 ÷ 4 = 8 ÷ 2 ÷ 2



Mo uses factors to work out 810 ÷ 6

Factors of 6 are 2 and 3:

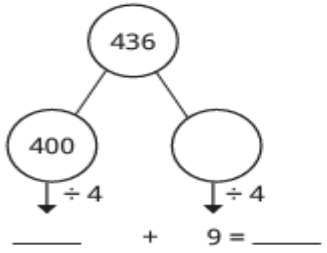
810 ÷ 2 = 405	or	810 ÷ 3 = 270
405 ÷ 3 = 135		270 ÷ 2 = 135

So 810 ÷ 6 = 135

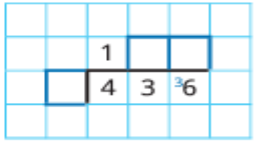
Here are four different ways of working out 436 ÷ 4

Complete the calculation in each method.

Method 1: Partitioning



Method 2: Short division

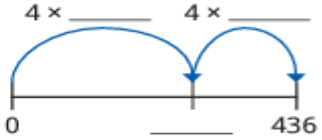


Method 3: Half and half again

436 ÷ _____ = 218

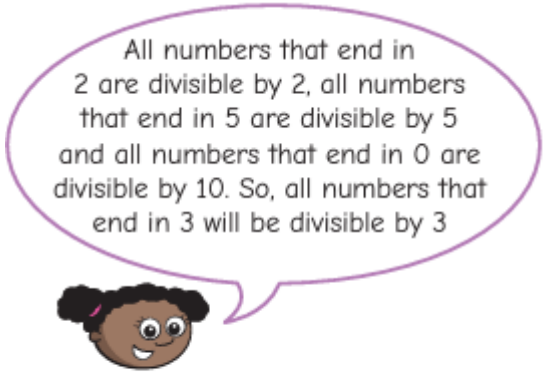
218 ÷ 2 = _____

Method 4: Finding groups of 4 along a number line



Key Questions:

- Which method do you find the easiest?
- Which method do you find the most efficient?
- How would you explain how this method works?
- What is the most efficient way to divide _____ by _____?
- What happens if you double one factor and halve the other?
- How can you use factor pairs to help you?
- How can you divide multiples of ten?



Is Whitney correct?

Explain your answer.

Key Vocabulary:

division
efficient
methods
appropriate
partitioning
known facts
factor pairs
number lines
formal written method
easiest
double/halve
multiples
result

Stem Sentences:

- To divide by 4, I can divide by _____ and then divide the result by _____.
- To divide by 8, I can divide by 2 _____ times.
- To divide by 6, I can divide by _____ and then divide the result by _____.

Maths – Multiplication and Division B

YEAR 5

Small Steps:

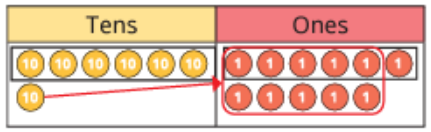
1. Multiply up to a 4-digit number by a 1-digit number.
2. Multiply a 2-digit number by a 2-digit number (area model).
3. Multiply a 2-digit number by a 2-digit number.
4. Multiply a 3-digit number by a 2-digit number.
5. Multiply a 4-digit number by a 2-digit number.
6. Solve problems with multiplication.
7. Short division.
8. Divide a 4-digit number by a 1-digit number.
9. Divide with remainders.
10. Efficient division.
11. Solve problems with multiplication and division.

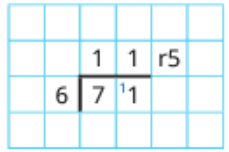
A minibus can seat 6 people.

71 people are going on a trip.

How many minibuses are needed?

Complete the sentences.





There are _____ groups of 6 people.

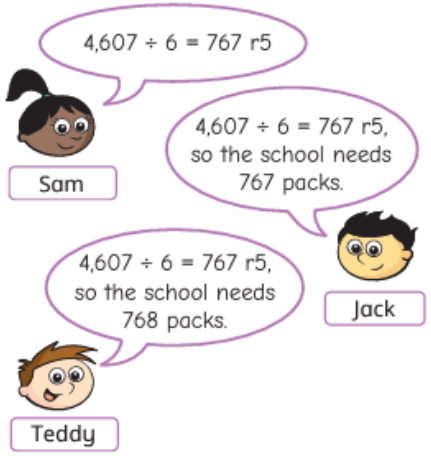
There are _____ people left over.

_____ minibuses are needed.

Textbooks come in packs of 6

A school needs 4,607 textbooks.

How many packs are needed?



Who do you agree with?

Explain your answer.

Key Questions:

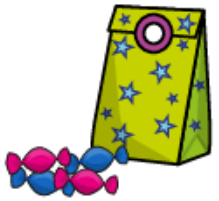
- What calculation do you need to do? How do you know?
- What does the remainder represent in this problem?
- Do you need more or fewer boxes/bags? What does the reminder mean here?
- How do you know if you need an extra box/bag?
- How many boxes can be filled? How many boxes do you need?
- Which operation is needed?

- Dani is filling party bags.

  Each party bag has 7 sweets in it.

  Dani has 349 sweets altogether.

  How many party bags can she fill?



- A train has 14 carriages.

  Each carriage can carry 42 people.

  512 people have reserved a seat.

  How many unreserved seats are there?

Stem Sentences:

- _____ ÷ _____ = _____ remainder _____
- There are _____ left over, so _____ are needed altogether.

Key Vocabulary:

multiplication
division
solve problems
operation
bar models
remainder
equal to
calculation
more/fewer
add
left over
altogether

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
3. Equivalent fractions and decimals (hundredths).
4. Equivalent fractions and decimals.
5. Thousandths as fractions.
6. Thousandths as decimals.
7. Thousandths on a place value chart.
8. Order and compare decimals (same number of decimal places).
9. Order and compare any decimals with up to 3 decimal places.
10. Round to the nearest whole number.
11. Round to 1 decimal place.
12. Understand percentages.
13. Percentages as fractions.
14. Percentages as decimals.
15. Equivalent fractions, decimals and percentages.

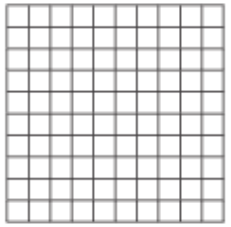
Whitney shares 1 whole into 10 equal parts.

Use the bar model to complete the sentences.

- One part is worth _____ tenth, which is written as _____
- Seven parts are worth _____ tenths, which is written as _____

Jack uses a hundred square to represent 1 whole.

Each part represents 0.01



Use the hundred square to complete the sentences.

- One part is worth _____ hundredth, which is written as _____
- Five parts are worth _____ hundredths, which is written as _____
- The whole square is worth _____ hundredths, which is written as _____

Huan uses place value counters to make the number 3.14

Use place value counters to make the numbers.

4.35	2.86	4.06	0.19

Key Questions:

- How can you represent this number using a place value chart?
- What is the same and what is different about a tenth and a hundredth?
- What is the value of the digit _____ in the number _____?
- Can you partition the decimal number _____ in different ways?
- How many tens are there in 100?
- How many ones are there in 10/100?
- How many 0.1s are there in 1?
- How many 0.01s are there in 0.1/1?

Fill in the missing numbers.

- 0.83 = _____ + 0.03 = _____ tenths and 3 hundredths
- 0.83 = 0.7 + _____ = 7 tenths and _____ hundredths

How many other ways can you partition 0.83?

Stem Sentences:

- _____ tenths/hundredths are equivalent to _____ wholes/tenths.
- The value of the digit _____ in the number _____ is _____.

Key Vocabulary:

tenths
hundredths
decimals
fractions
2 decimal places
thousandths
whole
exchange
place value
value
digit
partitioning
same/different

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
3. Equivalent fractions and decimals (hundredths).
4. Equivalent fractions and decimals.
5. Thousandths as fractions.
6. Thousandths as decimals.
7. Thousandths on a place value chart.
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9. Order and compare any decimals with up to 3 decimal places.
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11. Round to 1 decimal place.
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Kim uses a bar model to show the equivalence of 0.1 and $\frac{1}{10}$

She then uses a bar model to make a number.

Complete the sentences to describe Kim's number.

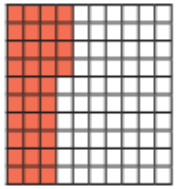
- The fraction represented is _____
- The decimal represented is _____
- The fraction _____ is equivalent to the decimal _____

Each square in the hundred grid represents 1 hundredth.

What fraction and what decimal of each hundred square is shaded?

Esther knows that each column in the hundred square is worth $\frac{1}{10}$

She shades some squares and describes the number.



There are $\frac{3}{10}$ and $\frac{4}{100}$ shaded.

This shows the decimals 0.3 + 0.04

$\frac{34}{100}$ = 0.34

Key Questions:

- What is the same/different about fractions and decimals?
- If a whole is split into 10 equal parts, what is each part worth?
- What does "equivalent" mean?
- What decimal is equivalent to the fractions ____?
- What fraction is equivalent to ____ 0.1s?
- When counting up in 1/10s/0.1s, what happens after 9/10/0.9?
- How many tenths are there in the number _____?
- What fractions is the decimal _____ equivalent to?
- What decimal is the fraction ____ equivalent to?
- What is the value of the digit ____ in ____?
- What fractions can the decimal _____ be partitioned into?
- How many tenths/hundredths are equal to 1 whole?
- How many hundredths are equal to 1 tenth?

Stem Sentences:

- The fraction ____ is equivalent to the decimal ____.
- The decimal ____ is equivalent to the fraction ____.
- There are ten ____ in 1 whole.
- There are _____ tenths and _____ hundredths in _____.
- ____ hundredths is equivalent to ____ tenths.

Key Vocabulary:

tenths
fractions
decimals
equivalent
within 1
greater than 1
place value
number lines
equal parts
crossing 1 whole
same/different
worth
hundredths
whole
2 decimal places
partitioned
mixed numbers
improper fractions

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
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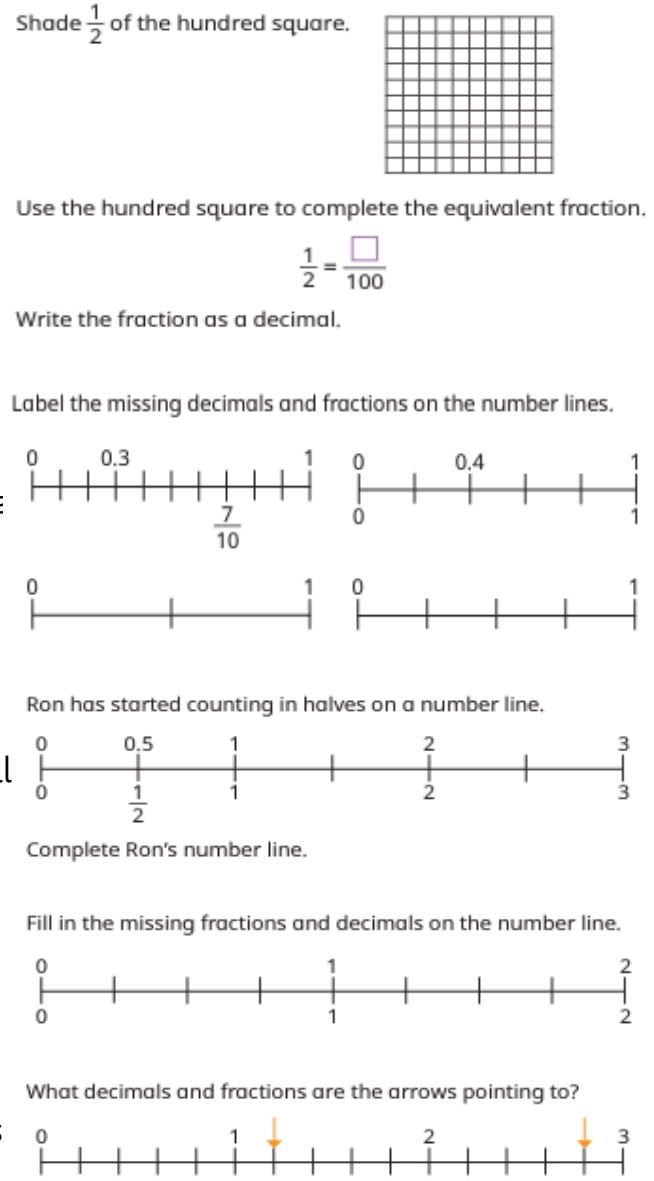
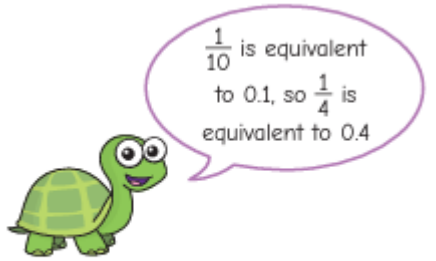


Key Questions:

- What is 1 whole shared equally into 2/4/5/10 equal parts?
- How can you tell what each interval on the number line is worth?
- What decimal is equivalent to the fraction ____?
- What fraction is the decimal ____ equivalent to?
- What is the same and what is different about the fraction ____ and the decimal ____?



Do you agree with Tiny?

Explain your answer.

Is the statement true or false?

2.5 as a fraction is $\frac{2}{5}$

Explain your answer.

Stem Sentences:

- The decimal ____ is equivalent to the fraction ____.
- ____ hundredths is equivalent to ____.
- If I know that ____ is equivalent to ____, then I also know that ____ is equivalent to ____.

Key Vocabulary:

equivalent
fractions
decimals
halves
quarters
fifths
tenths
divided
hundred
equal parts
number line
value
unit fraction
non-unit fractions
fraction wall
shared
equally
interval
worth
same/different
whole

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
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10. Round to the nearest whole number.
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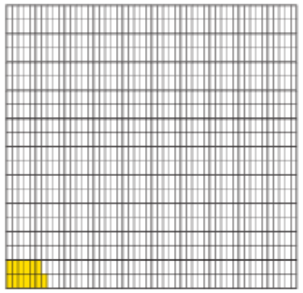
Here is a thousand square.



13 parts are shaded.

This represents $\frac{13}{1000}$

Scott uses place value counters to partition $\frac{342}{1000}$

$$\frac{342}{1000} = \frac{3}{10} + \frac{4}{100} + \frac{2}{1000}$$

The diagram shows the relationship between tenths, hundredths and thousandths.

Complete the sentences in as many ways as possible.

_____ is one-tenth the size of _____

_____ is 10 times the size of _____

The number 0.254 is made up of 2 tenths, 5 hundredths and 4 thousandths.

0.254 = 0.2 + 0.05 + 0.004

Key Questions:

- What is a thousandth?
- How are thousandths similar to/different from tenths/hundredths?
- How many thousandths are there in 1 whole?
- How many thousandths are there in 1 hundredth?
- How many thousandths are there in 1 tenth?
- How can you partition ____ thousandths?
- What fraction is made up of ____ tenths, _____ hundredths and ____ thousandths?
- Which is greater, 1 hundredths or 9 thousandths? How do you know?
- What does each digit in a decimal number represent?
- How are 0.001s similar to 1/1000s? How are they different?
- How many 0.001s are there in 1 whole/0.01/0.1?
- How can you represent 0.001s on a number line?

Stem Sentences:

- There are ____ thousandths in _____.
- $\frac{\square}{1000}$ is equivalent to $\frac{\square}{10} + \frac{\square}{100} + \frac{\square}{1000}$
- _____ is 10 times greater than ____.
- _____ is one-tenth the size of _____.
- There are ____ _____ in ____.

Key Vocabulary:

thousandths
tenth
whole
split
equal parts
hundredth
base 10
place value
exchanging
partition
similar to/different from
greater
equivalent
fractions
decimals
tenth the size
flexibly partition
3 decimal places
digit
10 times greater
one-tenth the size

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
3. Equivalent fractions and decimals (hundredths).
4. Equivalent fractions and decimals.
5. Thousandths as fractions.
6. Thousandths as decimals.
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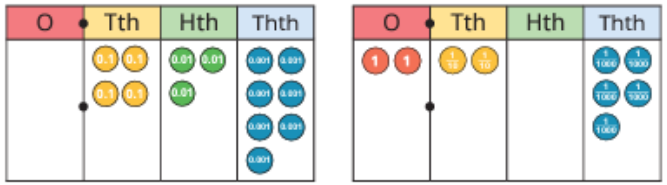
8. Order and compare decimals (same number of decimal places).
9. Order and compare any decimals with up to 3 decimal places.
10. Round to the nearest whole number.
11. Round to 1 decimal place.
12. Understand percentages.
13. Percentages as fractions.
14. Percentages as decimals.
15. Equivalent fractions, decimals and percentages.

Complete the sentences to describe each number.



There are _____ ones.

There are _____ tenths.

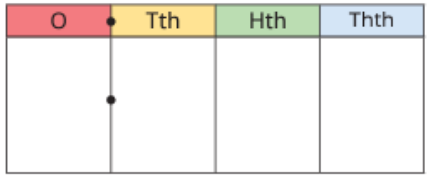
There are _____ hundredths.

There are _____ thousandths.

The number represented is _____

Brett has eight plain counters.

He makes numbers using the place value chart.



At least three columns contain counters.

What is the greatest number he can make?

What is the smallest number he can make?

Key Questions:

- What is a thousandth?
- How many thousandths are equivalent to 1 hundredth?
- How can you represent this decimal number on a place value chart?
- What is the value of the digit ____ in ____?
- How does a place value chart help you?
- What do you need to do when there are no counters in a column?

Dora and Ron have partitioned 0.132 in different ways.

Dora

0.132 = 0.1 + 0.03 + 0.002

0.132 = 0.1 + 0.02 + 0.012

Ron

Stem Sentences:

- _____ ones, _____ tenths, _____ hundredths and _____ thousandths make the decimal number _____.
- _____ can be partitioned into _____ + _____ + _____.
- I know that _____ is equivalent to _____ because...

Key Vocabulary:

thousandths
3 decimal places
place value
column
decimal numbers
tenths
partition
exchanging
values
flexibly partition
equivalent
hundredth

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
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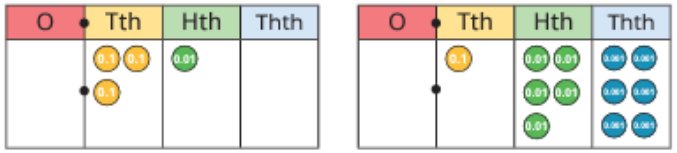
10. Round to the nearest whole number.
11. Round to 1 decimal place.
12. Understand percentages.
13. Percentages as fractions.
14. Percentages as decimals.
15. Equivalent fractions, decimals and percentages.

Rosie has made the numbers 0.31 and 0.156 on place value charts.



Which number is greater? How do you know?

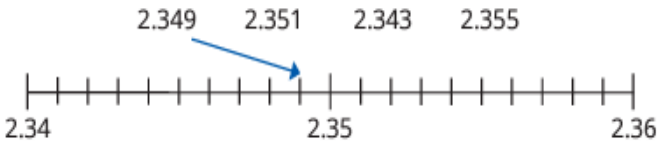
Write the numbers in ascending order.

0.379	0.209	0.693	0.895	0.172

Put these lengths in order, from longest to shortest.

1.45 m	0.98 m	1.6 m	2.1 m	1.405 m	1.61 m

Eva is using a number line to order some numbers.



Draw arrows to show the positions of the other numbers.

Write > or < to compare the numbers.

Use a place value chart and counters to help you.

0.465 ◯ 0.913 0.067 ◯ 0.029

1.546 ◯ 0.894 0.071 ◯ 0.007

Key Questions:

- How do you compare two numbers?
- Which column in the place value chart do you need to look at first?
- How can you compare two numbers that have the same number of tenths/hundredths?
- Which number is greater, _____ or _____?
- What does "ascending"/"descending" mean?
- What is the same and what is different about 1.4 and 1.305?
- What are the digits in each number worth?
- How can you represent these numbers on a place value chart?
- Which place value column in the chart has the greatest value? Which has the next greatest value?
- How can a place value chart help to show you which number is greater?
- How can you work systematically to order numbers in a list?

Key Vocabulary:

order
compare
decimals
2 decimal places
3 decimal places
place value
number lines
digits
column
greatest value
greater digit
ascending/descending
highest value
same/different
worth
greater/smaller

Stem Sentences:

- I need to start by looking at the column with the _____ place value.
- To compare _____ and _____, I need to first look at the _____ column.
- If the digits in the _____ column are the same, I need to look at the _____ column.
- _____ is greater/smaller than _____ because…
- The decimal _____ has a greater value than the decimal _____.
- _____ tenths/hundredths/thousandths are greater than _____ tenths/hundredths/thousandths, so _____ is greater than _____.

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
3. Equivalent fractions and decimals (hundredths).
4. Equivalent fractions and decimals.
5. Thousandths as fractions.
6. Thousandths as decimals.
7. Thousandths on a place value chart.
8. Order and compare decimal (same number of decimal places).
9. Order and compare any decimals with up to 3 decimal places.
10. Round to the nearest whole number.
11. Round to 1 decimal place.
12. Understand percentages.
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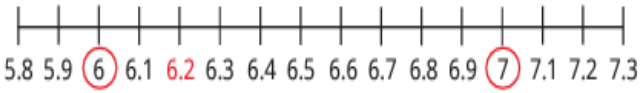
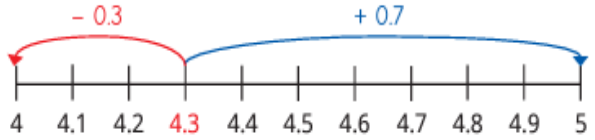
14. Percentages as decimals.
15. Equivalent fractions, decimals and percentages.

Huan has used a number line to find that the whole numbers either side of 6.2 are 6 and 7



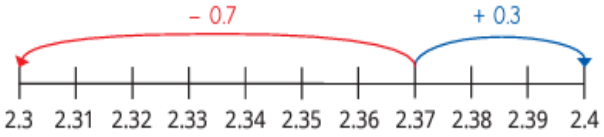
Dani is rounding 4.3 to the nearest whole number using a number line.



4.3 rounded to the nearest whole number is 4

Aisha has used a number line to find which numbers with 1 decimal place lie either side of 6.16

Teddy has used a number line to find that 2.37 rounded to 1 decimal place is 2.4



Key Questions:

- Which integers (whole numbers) lie either side of this decimal number?
- Where would the decimal ____ go on this number line?
- How can you work out which whole number a decimal number is closer to?
- Which whole number is the decimal ____ closer to? How do you know?
- What is halfway between these two whole numbers?
- When a decimal number has fewer than 5 tenths, does it round to the next or previous whole number? How do you know?
- How can you work out what numbers with 1 decimal place are either side of a number with two decimal places?
- Which number with 1 decimal place is your number closer to? How do you know?
- What number is halfway between the two numbers to 1 decimal place?
- How do you round a number that is halfway between the two numbers to 1 decimal place?

Stem Sentences:

- The whole numbers either side of ____ are ____ and _____.
- _____ is closer to ____ than _____.
- ____ rounded to the nearest whole number/1 decimal place is _____.
- The numbers with 1 decimal place either side of ____ are ____ and ____.
- Halfway between ____ and ____ is ____.

Key Vocabulary:

rounding
whole numbers
decimal numbers
1/2 decimal places
nearest
integers
place value
number line
closer to
greater/smaller
halfway
fewer
hundredths
column

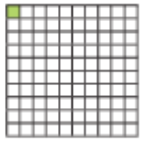
Maths – Decimals and Percentages

YEAR 5

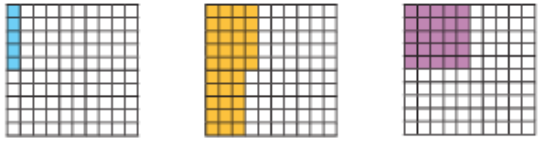
Small Steps:

1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
3. Equivalent fractions and decimals (hundredths).
4. Equivalent fractions and decimals.
5. Thousandths as fractions.
6. Thousandths as decimals.
7. Thousandths on a place value chart.
8. Order and compare decimals (same number of decimal places).
9. Order and compare any decimals with up to 3 decimal places.
10. Round to the nearest whole number.
11. Round to 1 decimal place.
12. Understand percentages.
13. Percentages as fractions.
14. Percentages as decimals.
15. Equivalent fractions, decimals and percentages.

The hundred square has 1 part shaded. This is 1%.



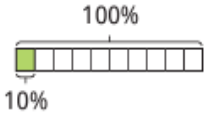
How many parts of each hundred square are shaded?



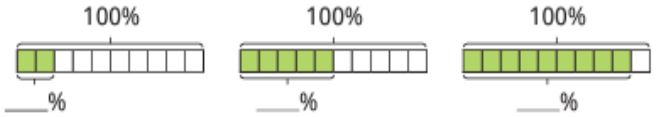
What percentage of each hundred square is shaded?

The bar model has been split into 10 equal parts and 1 part is shaded.

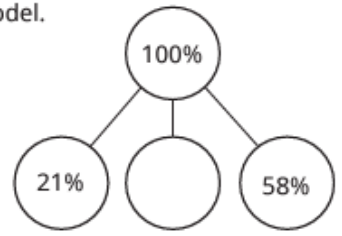
This is 10%:



What percentage of each bar model is shaded?



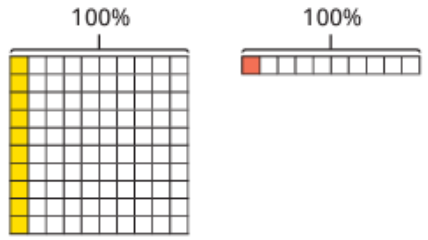
Complete the part-whole model.

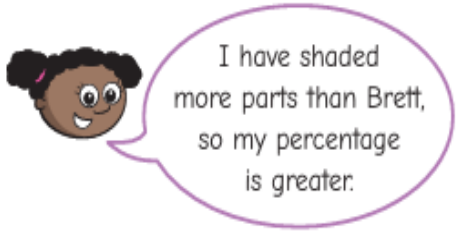


Key Questions:

- How many parts is the square split into?
- How many parts per hundred are shaded/not shaded?
- What percentage of the square is shaded/not shaded?
- What does "100%" mean?
- How many parts is the bar model split into?
- If the whole bar represents 100%, what is each part worth?

Whitney and Brett have drawn diagrams showing percentages.





Do you agree with Whitney?

Explain your answer.

Stem Sentences:

- If the whole is shared into 100 equal parts, then each part represents ____%.
- If the whole if shared into 10 equal parts, then each part represents ____%.
- ____ out of ____ equal parts are shaded. The percentage shaded is ____%.

Key Vocabulary:

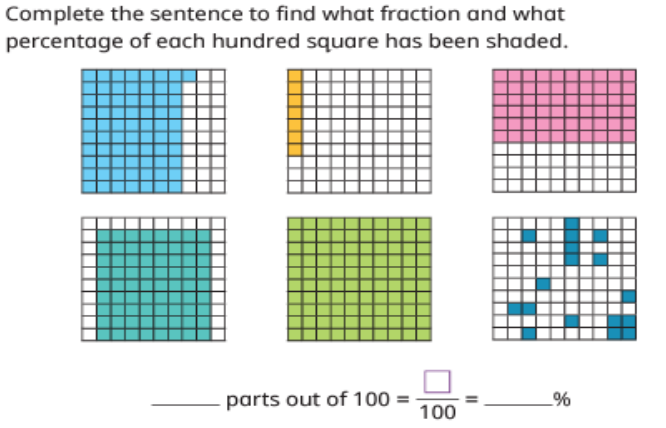
percentages
"per cent"
parts
hundred
whole
split
equal parts
hundredths
bar models
multiples
half
shaded
not shaded
worth

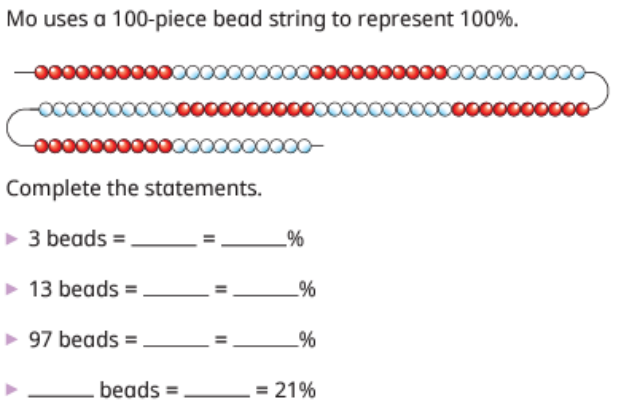
Maths – Decimals and Percentages

YEAR 5

Small Steps:

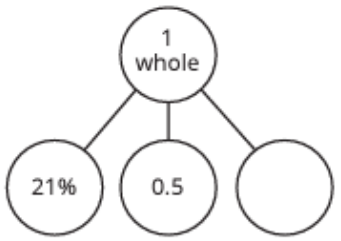
1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
3. Equivalent fractions and decimals (hundredths).
4. Equivalent fractions and decimals.
5. Thousandths as fractions.
6. Thousandths as decimals.
7. Thousandths on a place value chart.
8. Order and compare decimals (same number of decimal places).
9. Order and compare any decimals with up to 3 decimal places.
10. Round to the nearest whole number.
11. Round to 1 decimal place.
12. Understand percentages.
13. Percentages as fractions.
14. Percentages as decimals.
15. Equivalent fractions, decimals and percentages.





Key Questions:

- What is a percentage?
- If the whole is split into 100 equal parts, then what percentage is _____ parts equivalent to?
- How are percentages and fractions similar? How are they different?
- What is 100 divided by 2/4/5/10?
- What is ____ as a percentage?
- What is one half of 100? What is ½ as a percentage?
- What is similar/different about percentages and decimals?
- How many tenths/hundredths/per cent are equal to 1 whole?
- What percentage is equal to one hundredths? What is one hundredth as a decimal?
- What percentage is equal to one tenth? What is one tenth as a decimal?



Key Vocabulary:

percentages
fractions
parts per hundred
denominator
equivalent
fraction wall
split
groups
within 1 whole
divided
half
decimals
place value
equal parts
similar/different
tenths
hundredths

Stem Sentences:

- ____% is equivalent to □/100
- The fraction ____ is equivalent to _____%.
- ____ = ____%.
- There are ____ tenths/hundredths in 1 whole.
- ____% is equivalent to 1 whole.

Maths – Decimals and Percentages

YEAR 5

Small Steps:

1. Decimals up to 2 decimal places.
2. Equivalent fractions and decimals (tenths).
3. Equivalent fractions and decimals (hundredths).
4. Equivalent fractions and decimals.
5. Thousandths as fractions.
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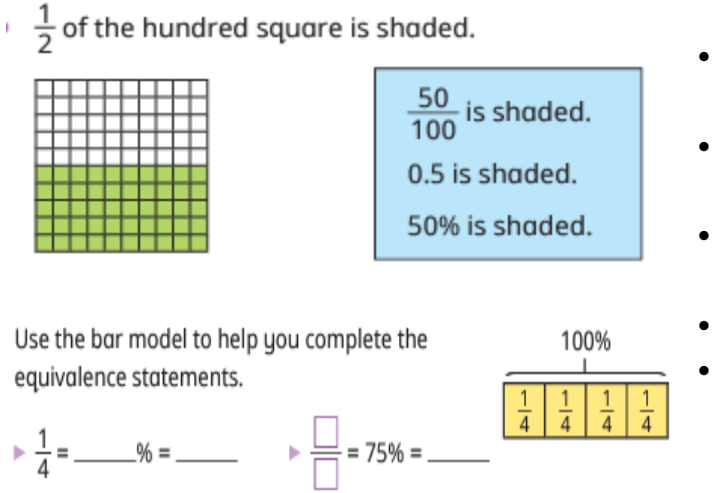
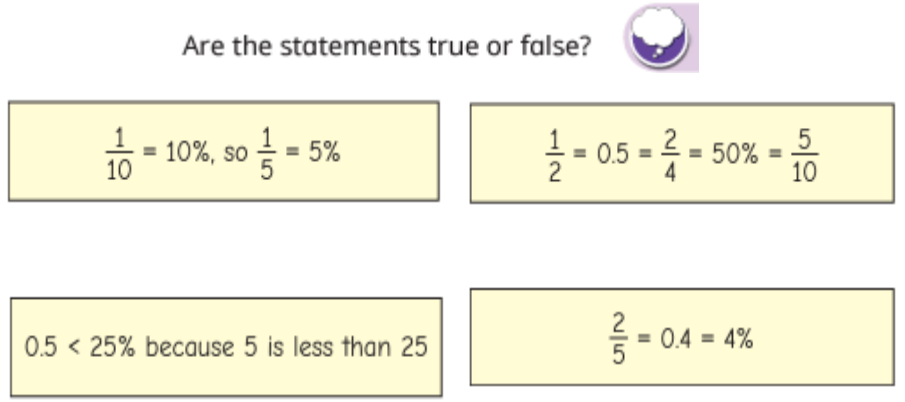


Key Questions:

- How can you find the fraction equivalent of a percentage?
- How can you find the decimal equivalent of a percentage?
- How many pats has the whole been split up into? So what fraction is each part worth?
- If the whole is 100%, what is 1/10?
- If 1/10 is equal to 10%, what is 3/10 equal to?



Key Vocabulary:

equivalents
fractions
decimals
percentages
halves
quarters
fifths
tenths
equal parts
hundredths
unit fraction
non-unit fractions
numbers lines
bar models
whole
equal to
worth

Stem Sentences:

The whole has been split into ____ equal parts, so each part is worth $\frac{1}{\square}$.

If the whole is equal to 100%, then each part if worth ____%.

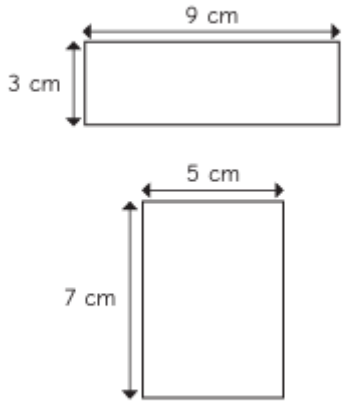
Maths – Perimeter and Area

YEAR 5

Small Steps:

1. Perimeter of rectangles.
2. Perimeter of rectilinear shapes.
3. Perimeter of polygons.
4. Area of rectangles.
5. Area of compound shapes.
6. Estimate area.

Esther thinks that she has drawn all the possible rectangles with a perimeter of 24 cm.

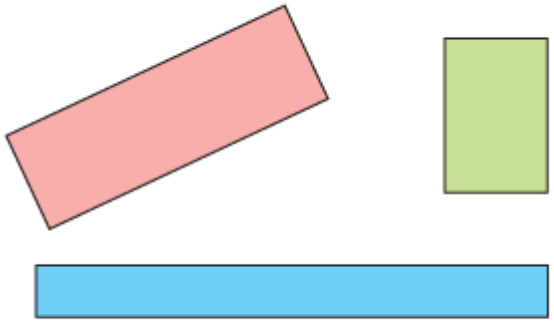


Do you agree with Esther?

Explain your answer.

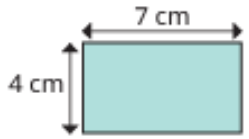
What is the length of each line?

Measure the sides of the rectangles to work out their perimeters.



_____ cm + _____ cm + _____ cm + _____ cm = _____ cm

Rosie and Eva are finding the perimeter of this rectangle.



Rosie 7 cm + 4 cm + 7 cm + 4 cm = 22 cm

Eva 7 cm + 4 cm = 11 cm 11 cm × 2 = 22 cm

What is the same about the methods? What is different?

Key Questions:

- What does perimeter mean?
- If a rectangle has a perimeter of 16cm, could its length be 10cm? Why or why not?
- Once you have measured the sides, how do you work out the perimeter?
- If you know the length and width of a rectangle, do you need to measure the other two sides?
- Which method do you think is more efficient?

Is the statement always true, sometimes true or never true?

> When the sides of a rectangle are all odd numbers, the perimeter is even.

Explain your answer.

Teddy thinks this chew bar is 13.2 cm long.

Do you agree?

Explain your answer.

Stem Sentences:

- The length is _____ and the width is _____, so the perimeter is _____.
- _____ + _____ + _____ + _____ = 2 x _____ + 2 x _____.
- The perimeter of the rectangle is.

Key Vocabulary:

perimeter
rectangles
measuring
sides
calculation
distance
around
outside
2-D
two dimensional
shape
ruler
accurately
adding
length
width
doubling
efficient

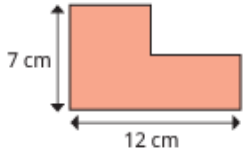
Maths – Perimeter and Area

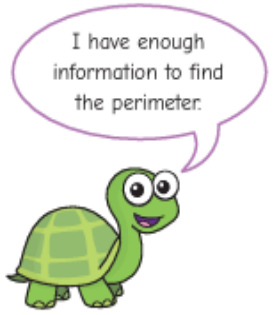
YEAR 5

Small Steps:

1. Perimeter of rectangles.
2. Perimeter of rectilinear shapes.
3. Perimeter of polygons.
4. Area of rectangles.
5. Area of compound shapes.
6. Estimate area.

Tiny is finding the perimeter of this shape.

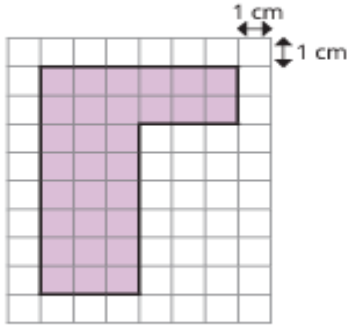


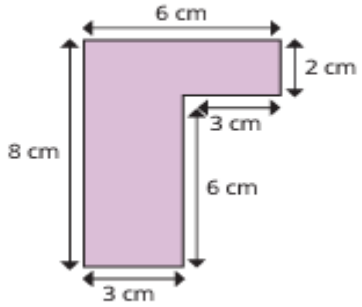


Do you agree with Tiny?

Explain your answer.

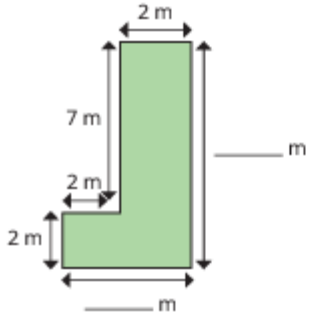
Work out the perimeters of the shapes.

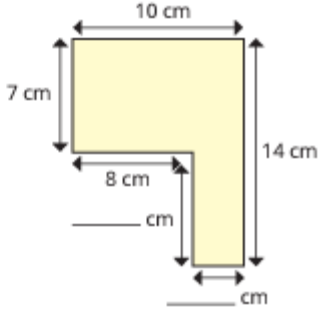




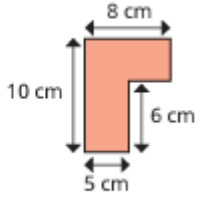
What do you notice?

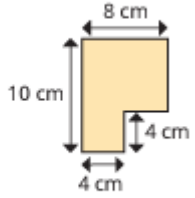
Work out the unknown lengths on each rectilinear shape.





Work out the perimeters of the shapes.



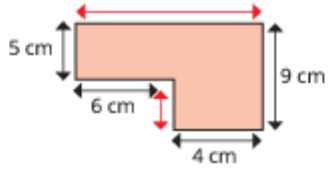


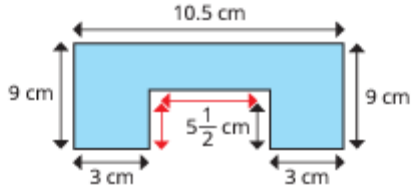
What do you notice?

Key Questions:

- What does perimeter mean?
- What are the properties of a square/rectangle?
- Why is this a rectilinear shape?
- How can you use the labelled sides to find the unknown side of the rectilinear shape? Do you need to add or subtract?
- What strategies can you use to work out the perimeter?
- How do you know that you have included all the sides?
- What is the perimeter of the shape?

Find the unknown lengths (shown in red) and then the perimeter of each shape.





Stem Sentences:

- _____ + _____ = _____, so the longer side = _____.
- _____ - _____ = _____, so the other shorter side = _____.
- The perimeter of the shape is _____.

Key Vocabulary:

perimeter
rectilinear
shape
straight sides
right angles
rectangles
joined
compound shape
calculating
total
square
add/subtract
strategies
longer/shorter
properties

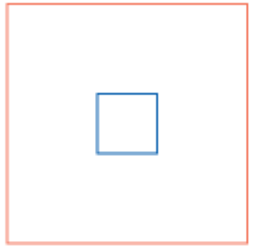
Maths – Perimeter and Area

YEAR 5

Small Steps:

1. Perimeter of rectangles.
2. Perimeter of rectilinear shapes.
3. Perimeter of polygons.
4. Area of rectangles.
5. Area of compound shapes.
6. Estimate area.

Here is a square inside another square.



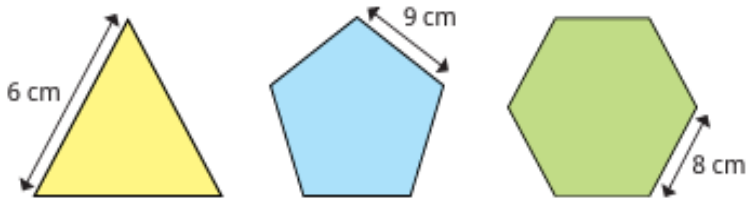
One side of the inner square is 4 cm long.

The perimeter of the outer square is four times the perimeter of the inner square.

What is the length of one side of the **outer** square?

Show your workings.

Work out the perimeter of each regular shape.



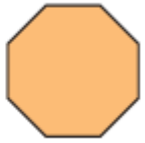
Each regular hexagon on the grid has a side length of 2 cm.

What is the perimeter of the shaded shape?

Mo measures three sides of this regular octagon.

The total length of the three sides is 21 cm.

What is the perimeter of the octagon?



Tom wants to find the perimeter of a swimming pool.

The length of the pool is three times the width.

The width is 16 m.

What is the length of the swimming pool?

What is the perimeter of the swimming pool?

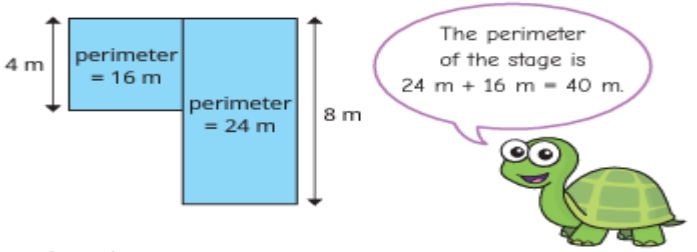
Key Questions:

- What is a regular shape?
- What is the difference between a square and a rectangle?
- Are all rectangles regular?
- How many sides does the shape have?
- What calculation will give you its perimeter?
- Would drawing the shape help you to solve the problem?
- What operation are you going to use? Why?

A school stage is made up of two parts.

The larger part has a perimeter of 24 m and a length of 8 m.

The smaller part has a perimeter of 16 m and a length of 4 m.



Explain why Tiny is wrong.

Find the actual perimeter of the stage.

Stem Sentences:

- A ____ shape has equal sides and angles.
- The regular shape has ____ sides and each side is ____. Therefore, the perimeter is ____ x _____ = _____.
- To find the perimeter of the shape, I need to...
- The perimeter of the shape is ...

Key Vocabulary:

perimeter
polygons
2-D
two dimensional
shape
straight
sides
regular
irregular
equal
angles
square
rectangle
length
multiplying
adding
known values
problem solving
difference
calculation
operation

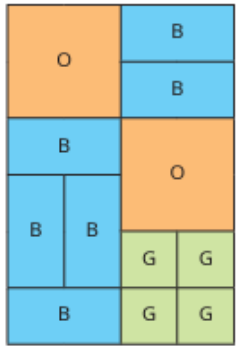
Maths – Perimeter and Area

YEAR 5

Small Steps:

1. Perimeter of rectangles.
2. Perimeter of rectilinear shapes.
3. Perimeter of polygons.
4. Area of rectangles.
5. Area of compound shapes.
6. Estimate area.

Each orange square (O) has an area of 24 cm²



Calculate the total orange area.

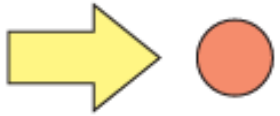
Calculate the blue (B) area.

Calculate the green (G) area.

What is the total area of the whole shape?

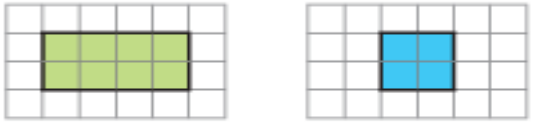
Which shape has the greater area?

How do you know?



On the grid, the area of each square is 1 cm²

Find the area of each shape.



Complete the sentences to find the area of the rectangle.

- There are _____ rows of _____ squares.
  There are _____ squares altogether.
  _____ × _____ = _____
- There are _____ columns of _____ squares.
  There are _____ squares altogether.
  _____ × _____ = _____

What do you notice?

The area of the rectangle is 18 cm²

What is the width of the rectangle?

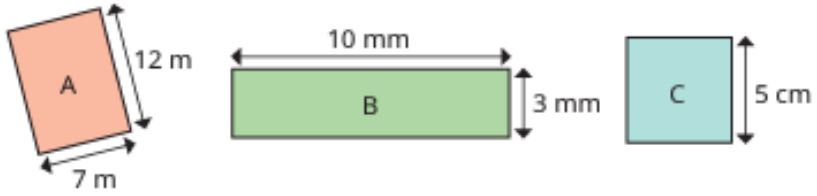
Key Questions:

- What is area?
- What is the difference between 1cm and 1cm2?
- Which shape has the greater/greatest are? Can you tell just by looking?
- How can you work out area in a more efficient way?
- Will multiplying the length by the width calculate the area of any shape? Why/why not?

Shapes A and B are rectangles.

Shape C is a square.

Work out the area of each shape.



Stem Sentences:

- There are _____ squares inside the shape, so the area of the shape is _____ squares.
- Area = _____ x _____.
- _____ x _____ = _____, so the area of the shape is_____.

Key Vocabulary:

area
inside
2-D
two dimensional
shape
counting
squares
Centimetre squared
arrays
cm2
multiply
length
width
calculate
rectangle
difference
greater/greatest
efficient

Maths – Perimeter and Area

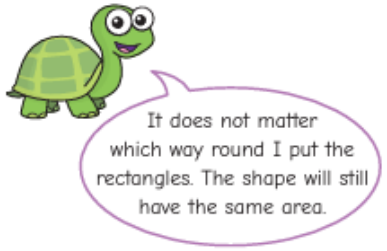
YEAR 5

Small Steps:

1. Perimeter of rectangles.
2. Perimeter of rectilinear shapes.
3. Perimeter of polygons.
4. Area of rectangles.
5. Area of compound shapes.
6. Estimate area.

Tiny puts three 7 cm by 4 cm rectangles next to each other.

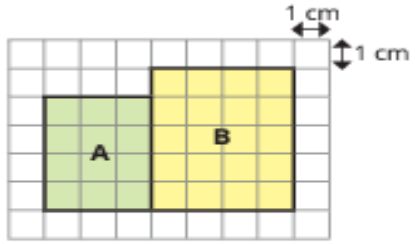
What is the area of the compound shape?



Do you agree with Tiny?

Explain your reasoning.

A compound shape is made up of two rectangles, A and B.

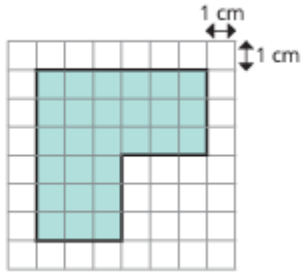


- What is the area of A?
- What is the area of B?
- What is the area of the compound shape?

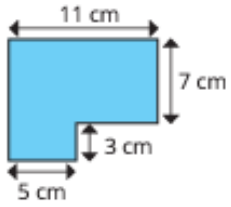
Find the area of the compound shape.

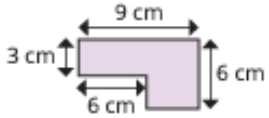
How many ways can you split the compound shape in order to work out the area?

Compare methods with a partner.



Find the areas of the compound shapes.

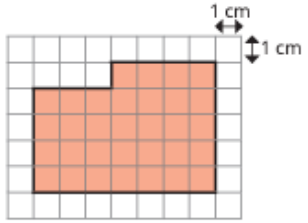




Key Questions:

- How do you work out the area of a rectangle?
- Are there any rectangles within the shape?
- How can you split the shape?
- Is there more than one way to split the shape?
- Do you get a different total area if you split the shape differently?

Whitney has found the area of this compound shape.



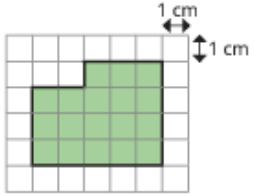
$7 \times 5 = 35$

$35 - 3 = 32$

The area is 32 cm^2

Explain why Whitney's method works.

Use Whitney's method to find the area of the shape.



Stem Sentences:

- To find the area of the compound shape, I need to split it into ____ and then...
- Area of rectangle A = ____.
- Area of rectangle B = ____.
- Total area = ____ + ____ = _____

Key Vocabulary:

calculate
area
compound shapes
rectilinear
rectangle
deduce
total
lengths
widths

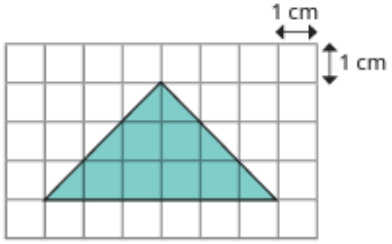
Maths – Perimeter and Area

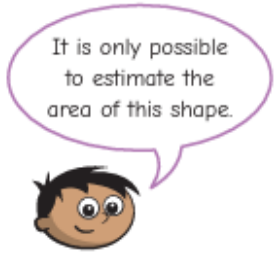
YEAR 5

Small Steps:

1. Perimeter of rectangles.
2. Perimeter of rectilinear shapes.
3. Perimeter of polygons.
4. Area of rectangles.
5. Area of compound shapes.
6. Estimate area.

Amir is finding the area of the shape.

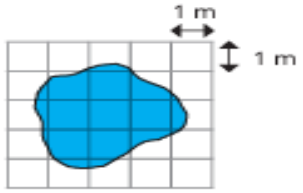




Do you agree with Amir?

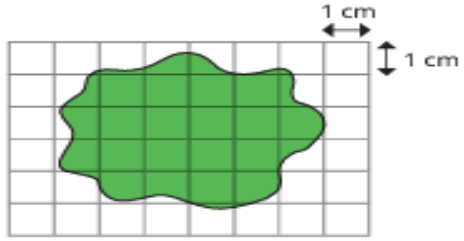
Explain your answer

Jack estimates the size of the pond as 8 m²



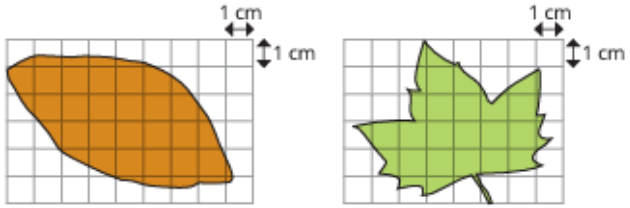
How do you think Jack made his estimate?

Here is a shape on a centimetre squared grid.



- How many full squares are covered?
- How many squares are more than half covered?
- Estimate the area of the shape.

Estimate the area of each leaf.



Which area was easier to estimate? Why?

Compare answers with a partner.

Key Questions:

- What does "approximate" mean?
- What does "estimate" mean?
- How many whole squares are covered?
- How many part squares are more than half covered?
- Are there any part-covered squares that you could combine to make a full square?
- Does it matter if your answer is not exactly the same as a partners? Why? Why not?

Use centimetre squared paper.

Draw a "Pirate Island" to be used as a treasure map.

Each square represents 4 m²

The Pirate Island must have a total area of 240 m²

The island must include these features:

- lake with a total area of 58 m²
- forests with a total area of 86 m²
- mountains with a total area of 92 m²
- marshes with a total area of 12 m²

Stem Sentences:

- ____ whole squares are covered.
- ____ squares are more than half covered.
- Estimate of the total area = ____ + _____ + _____cm2.

Key Vocabulary:

counting squares
estimate
areas
non-rectilinear shapes
total
square
half
fractions
covered
larger
multiplying
length
width
wholes
match
approximate
combine

Maths – Statistics

YEAR 5

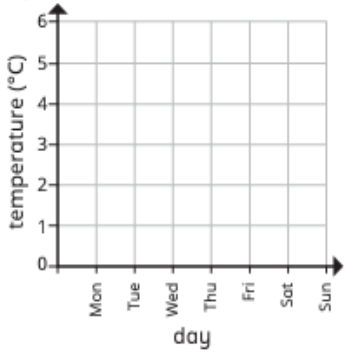
Small Steps:

1. Draw line graphs.
2. Read and interpret line graphs.
3. Read and interpret tables.
4. Two-way tables.
5. Read and interpret timetables.

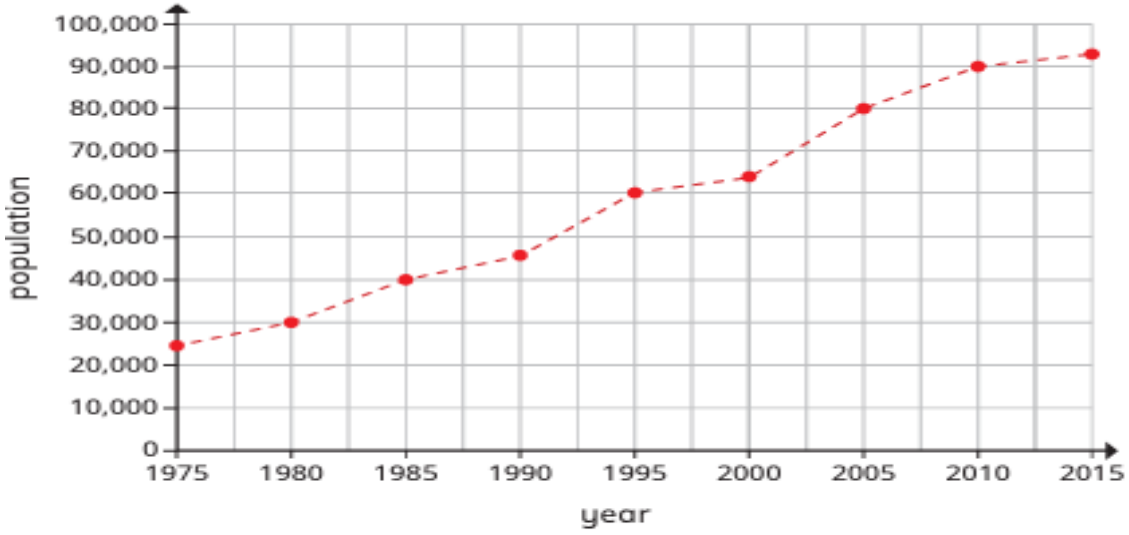
Scott records the temperature every day for a week.

Use his results to draw the line graph.

Day	Temperature (°C)
Monday	2
Tuesday	3
Wednesday	3
Thursday	5
Friday	4
Saturday	2
Sunday	1



- The line graph shows the population growth of a town.



- In what years was the population recorded? How do you know?
- What was the population in 1985?

Key Questions:

- What information do you want to show with your line graph?
- What does the vertical/horizontal axis on the graph represent?
- What information will go on which axis? Why?
- Will you join the points with a solid line or a dashed line? Why?
- What scale would be most appropriate for the vertical axis?
- How can you use multiples to support your choice of intervals for the vertical axis?

What information is being presented on the line graph?
What does each axis on the line graph show?
How can you summarise what the graph shows?
What lines can you draw to help read the graph?
Why do you think the direction of the line changes at this point in the line graph?
Is your answer exact or an estimate?

Stem Sentences:

The horizontal axis shows _____.
The vertical axis shows _____.
The intervals on the vertical axis go up in_____.
The horizontal axis shows _____ and the vertical axis shows _____.
At _____, the graph reads _____.
At _____, the graph reads _____.
The difference between the two points are _____.

Key Vocabulary:

interpret
line graph
horizontal
vertical
axis
measure
straight dashed line
exact values
data
intervals
greatest/lowest
appropriate scale
information
solid line
multiples
solve problems
variable
difference
points
inferences
estimating
summarise

Maths – Statistics

YEAR 5

Small Steps:

1. Draw line graphs.
2. Read and interpret line graphs.
3. Read and interpret tables.
4. Two-way tables.
5. Read and interpret timetables.

Mo collects information from children about their favourite colour.

He puts the information into a table.

Colour	Red	Yellow	Green	Blue	Orange	Purple
Number of children	3	7	5	17	6	7

- How many children prefer orange?
- What is the most popular colour?
- What is the least popular colour?
- How many children did Mo ask?
- How many more children like purple than like green?

What other questions could you ask about this table?

The table shows the six largest football stadiums in Europe.

Stadium	City	Country	Capacity
Camp Nou	Barcelona	Spain	99,365
Wembley	London	UK	90,000
Signal Iduna Park	Dortmund	Germany	81,359
Estadio Santiago Bernabeu	Madrid	Spain	81,044
Luzhniki Stadium	Moscow	Russia	81,006
San Siro	Milan	Italy	80,018

Are the statements true or false?

The fourth largest stadium is San Siro.

There is one stadium with a capacity greater than 90,000

Three of the largest stadiums are in Spain.

Key Questions:

- What information is given in this table?
- What are the column/row headings of the table?
- Why is it important to include the units of measure in the table?
- What is the total of ____?
- How can you find the difference between two pieces of information given in the table?
- How is a table similar to/different from a line graph?

Here is a table with information about four planets.

Planet	Time for revolution	Diameter (km)	Time for rotation
Mercury	88 days	4,878	59 days
Venus	225 days	12,104	116 days
Earth	365 days	12,756	24 hours
Mars	687 days	6,794	25 hours

- How many of the planets take more than one day to rotate?
- Which planet takes more than one year for one revolution?

Stem Sentences:

- The value in _____ is _____.
- The value in _____ is _____.
- The difference between the values is _____.
- The _____ with the most/least _____ is _____.

Key Vocabulary:

interpret
data
presented
tables
extract
retrieval questions
comparing
amounts
inferring
grouping
addition
subtraction
comparisons
column
row
headings
units of measure
difference
similar to/different from
line graph
value
most/least

Maths – Statistics

YEAR 5

Small Steps:

1. Draw line graphs.
2. Read and interpret line graphs.
3. Read and interpret tables.
4. Two-way tables.
5. Read and interpret timetables.

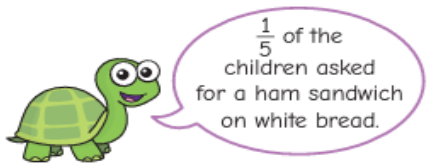
The two-way table shows the staff at a police station.

	No glasses	Glasses	Total
Constable	55	24	79
Sergeant	8	5	13
Inspector	2	4	6
Chief Inspector	1	1	2
Total	66	34	100

- How many inspectors wear glasses?
- How many sergeants do not wear glasses?
- How many constables are there altogether?
- How many people work at the police station?

The table shows the types of sandwiches chosen by a group of children on a school trip.

	White bread	Brown bread	Total
Ham		15	25
Cheese	13		35
Jam		8	17
Tuna	15		23
Total			



Do you agree with Tiny?

Explain your answer.

The table shows some information about how children in Key Stage 1 and Key Stage 2 travel to school each morning.

	KS1	KS2	Total
Walk		95	118
Car	45		70
Bus	9	27	
Bike		56	56
Total			

- Complete the table.
- Which key stage has more children in it?
- What is the most popular method of getting to school for each key stage?

Key Questions:

- What information is given by this table?
- What are the column/row headings for the table?
- How can you find the difference between two pieces of information given in the table?
- How can you work out the missing information in the table?
- Do you need to add or subtract? How do you know?
- What conclusions can you draw from the table?

The table shows information about type of pet and the pet's gender.

	Male	Female	Total
Dogs		44	
Cats	38		
Total	125		245

Fill in the missing numbers in the table.

- How many more male dogs are there than female dogs?
- How many more female cats are there than male cats?

Stem Sentences:

- The columns show _____ and the rows show _____.
- Where the _____ column meets the _____ row, this shows _____.
- To find a missing total, I need to _____ the numbers in a _____ or _____.
- To find the missing value, I need to _____ from _____.

Key Vocabulary:

two-way tables
variable
cell
horizontal
vertical
labels
total
column/row
headings
difference
add/subtract
conclusions

Maths – Statistics

YEAR 5

Small Steps:

1. Draw line graphs.
2. Read and interpret line graphs.
3. Read and interpret tables.
4. Two-way tables.
5. Read and interpret timetables.

Here is part of a train timetable.

London Euston	06:35	15:10	16:10	18:40
Watford Junction	06:50	15:25	16:25	18:55
Milton Keynes Central	07:10		16:50	
Northampton	07:15	15:55	16:55	19:25
Rugby	07:24	16:04	17:04	19:34
Coventry	07:44	16:14	17:13	19:43
Birmingham New Street	08:09	16:41	16:41	20:11

- What time does the 15:10 train from London Euston get to Coventry?
- Annie gets on the train at Northampton.

  How many stops are there before she gets to Birmingham New Street?
- Ron gets a train from Watford Junction to Rugby.

  He arrives in Rugby at 16:04

  What time did he get on the train?
- Why are some parts of the table blank?

Key Questions:

- What information does this timetable tell you?
- How is a timetable the same as/different from a two-way table?
- What is the same and what is different about each row/column of the timetable?
- What does the ____ row/column tell you?
- At what time does the ____ from ____ get to ____?
- How many ____ are there?
- What does a blank space in a timetable mean?

Key Vocabulary:

timetables
two-way table
interpret
calculations
information
same as/different from
row/column

This is Alex's school timetable.

	Daily Assembly (09:00–09:15)	1 09:15–09:55	2 09:55–10:45	Break (10:45–11:05)	3 11:05–11:55	4 11:55–12:45	Lunchtime (12:45–13:45)	5 13:45–14:35	6 14:35–15:25
Mon		Literacy	English		Maths	ICT		PSHCE	Geog
Tue		English	Art		French	Science		DT	
Wed		Literacy	DT		Art	Drama		ICT	Science
Thur		PE	Maths		RE	English		History	PSHCE
Fri		Literacy	Maths		Art	Science		PE	

- How many Literacy lessons does Alex have in a week?
- Which afternoons does she only have one subject?
- How many more Maths lessons does Alex have in a week than ICT lessons?
- At what time does Alex's Science lesson on Friday start?

What other questions can you think of for Alex's timetable?

Stem Sentences:

- The ____train from ____ gets to ____ at _____.
- The next available ____ is at ____.
- The journey/lesson/programme starts at ____ and ends at ____.