Division

Resources
Number lines
Arrays
Bead strings
Arrow cards
Numicon
Dienes
Objects/counters

Context
Money
Measures
Fractions
Decimals
Percentages

Through discussion children need to:
1. Read, understand and interpret the question.
2. Identify the calculation as a number sentence.
3. Think about skills that will help to solve the calculation (doubling, number bonds, partitioning, multiples)
4. Choose and appropriate method.
5. Record the number sentence and solution

Progression in Number
U ÷ U
TU ÷ U
With remainders
HTU ÷ U
Rounding remainders
TU ÷ TU
HTU ÷ TU
Remainders in 3 ways: R1, 1/2, 0.5

Using and applying question starters

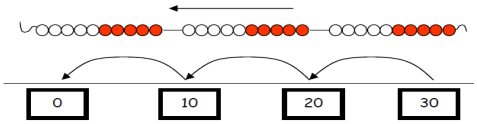
What multiplication fact can you use to find ….?
If you know ? ÷ ? = ?, what else do you know?
Tell me some division questions that have the answer 15. How did you work them out?
These division calculations have errors. What are the errors? Explain how to put them right.
What is the missing number in 35 ÷ ? = 5. How do you know?

Make regular and useful links with FRACTIONS!

Stage 1

- Count back in twos from 20, and tens and fives from 100.
- Share out concrete objects in twos, fives and tens.
- Share out items in play and problem solving.
- Know doubles and halves to 20.

Counting back in steps on a number line or counting stick.



- Start to understand the terms ‘grouping’ and ‘sharing’.

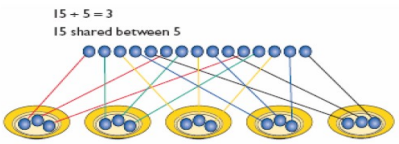
I’ve got 12 shells. How could I share them between 2 children?

Copy and continue this pattern: 20, 18, 16…..

Role Play

Stage 2

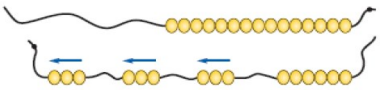
- Understand division as sharing



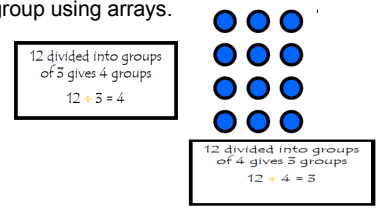
AND

- Understand division as grouping

15 ÷ 3 = 5



- Reinforce division as group using arrays.



Sophie has 10 apples, Sophie wants to share half of the apples with her brother. How many do they each get?

I have 15p. How many 5p sweets can I buy?

Chocolate eggs are put in boxes of 2.
How many boxes would I need for 6 eggs? How many boxes would I need for 9 eggs?

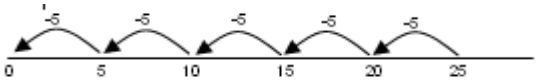
How many 5cm pieces of string can I cut out of a piece of string 27cm long?

I find a pile of 17 wheels. How many bikes can I make?

Stage 3

- Use multiplication facts to work out corresponding division facts for 2, 5, and 10s.
- Use a number line for repeated subtraction.

25 ÷ 5 = 5



Children need to learn that you can solve division by counting UP or counting BACK.

How many 3p lollies can you buy with 45p? Show me how you worked this out.

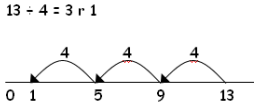
What multiplication fact can you use to find the answer to 28 ÷ 4?

Find some division calculations that have the answer 6. How did you do this?

Stage 4

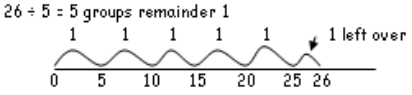
- Include remainders

Count back



OR

Count on



36 children need to sit on benches. 5 children can sit on a bench. How many benches are needed?
Harry saves 20p coins. He has saved £3.20. How many coins has he saved?
What is the biggest remainder you can have when you divide a number by 3? How did you collect information to answer this question?

<table>
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<td>Stage 5</td>
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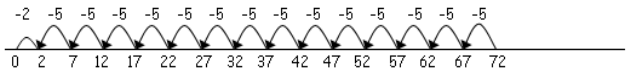
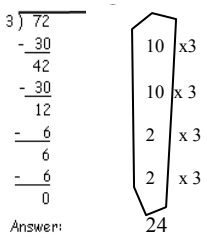
Use number lines for chunking. TU ÷ U
Start to make decisions about size of jump to make calculating more efficient.

72 ÷ 5


Becomes:


Then onto the vertical method:
Short division TU ÷ U
72 ÷ 3


Understand and describe the effect of dividing a number by 10, 100

<table>
<tr><td>Th</td><td>H</td><td>T</td><td>U</td></tr>
<tr><td>2</td><td>7</td><td>0</td><td>0</td></tr>
<tr><td></td><td></td><td>2</td><td>7</td></tr>
</table>
2700 ÷ 100
Each digit moves two columns to the right and zero is used as a place holder *

Derive quickly all division facts corresponding to 1-12 times tables

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<td>
A piece of rope 204cm long is cut into 4 equal pieces. Which of these gives the length of each piece in centimetres?
A 204 ÷ 4
B 204 x 4
C 204 - 4
D 204 + 4

Harry worked out the correct answer to 70 ÷ 5. His answer was 14. Show how he could have worked out his answer.

Make up some division questions that have a remainder of 3. How did you do it?

1/3 of 75 is 25. Write this as a division statement.

If you know 42 ÷ 6 = 7, what else do you know?

Divide 4.2 by 6.

Would you use a mental, written or calculator method to solve each of these? Explain your choice.
23.5 × = 176.25

How many cartons of juice costing 30p each can I buy with £2?

If 7 × 8 = 56 what is 0.07 × 8? Give some other decimal facts that are linked to this multiplication fact. What number multiplied by 8 gives 4.8?

* reinforce that moving to the right means the columns are worth less
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<td>Stage 6</td>
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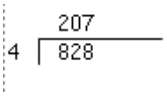
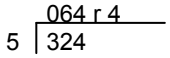
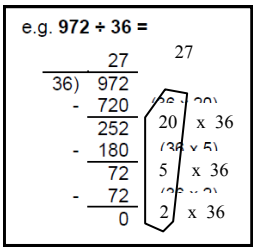
Bus stop method



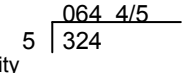
Including remainders

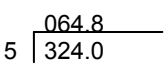


Use chunking to solve HTU ÷ TU

Chunking uses repeated subtraction. Taking away larger ‘chunks’ of the divisor.
e.g. 972 ÷ 36 =


Be able to find remainders in whole number form, fraction form and decimal form.





Know and use tests of divisibility
Use known facts to solve similar division problems

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How do you know that 234 is divisible by 3?

Work out 261 ÷ 3. Explain each step.

Find a number between 350 and 360 that gives a remainder of 5 when divided by 8.

A number that ends in the digits 52 is always divisible by 4. Give me an example where the statement is true. Can you find an example when it is false? Why not?

Find different ways of completing this calculation:
240 ÷ ? = ?

John says: ‘I think three eighths of a day is 10 hours.’ Is he right?

Work out which is larger: 3/5of 480kg or 7/8 of 320kg.

Explain how you can use the fact 7 × 8 = 56 to find the answer to 5.6 ÷ 0.8.

How many 250 ml cups of tea can you pour from a tea urn that holds 8.5 litres?
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<td>Stage 7</td>
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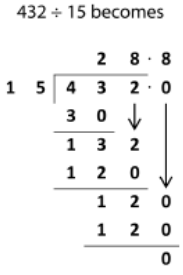
Long division

432 ÷ 15 becomes


Answer: 28·8
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A packet contains 1.5kg of rabbit food. Rennie feeds her rabbit 30g of food each day. For how many days does the packet of food last?

Lynne wants to raise £200. She is sponsored for £6.50 for each lap. What is the least number of laps she must do?
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