

**At home materials**  
**Guidance pack**  
**Year 2 Weeks 6-8**

**Pack 1: Addition key facts**

- Session A) Addition and subtraction
- Session B) Using key facts within ten
- Session C) Using key facts within twenty
- Session D) Modelling problems

**Pack 2: Multiplication and division**

- Session A) Describing equal groups
- Session B) Multiplication situations
- Session C) Arrays
- Session D) Times greater

**Pack 3: Numbers**

- Session A) Counting and grouping
- Session B) Value of place
- Session C) Regrouping
- Session D) Build and adjust



**Timing**

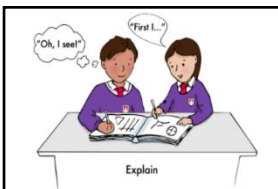
Each session is 30 minutes  
20 minute Talk Task and 10 minute independent activity

**Session guidance**

Get **them** talking and grow their language.

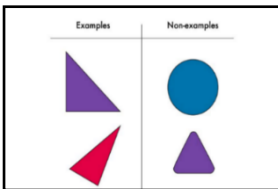
Get **them** to use equipment, manipulatives, models and images to show and explain.

Challenge **them** to think mathematically. Use the Prompts for Thinking listed below to help them to build up habits in the way they think about mathematical situations.



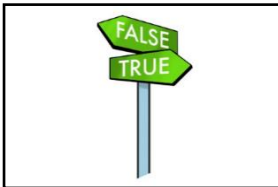
**Reason it**

Explain how you know. Focus on reasons rather than answers. What could you say, do, draw or write to help someone else understand?



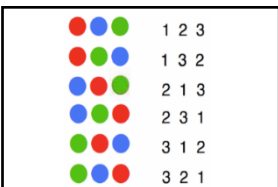
**Generate examples and non-examples**

What are the important features? What features are not important (e.g. colour)?



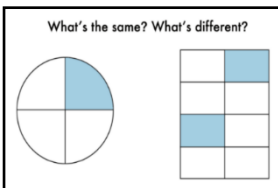
**True or false?**

If true, give examples to support your answer.  
If false, give a counter example.



**Find all possibilities**

Have you found all the possible answers? How do you know? Did you work systematically?



**What's the same? What's different?**

Compare and contrast and look for connections.  
How many different answers can you give?



**Always, sometimes or never true?**

Give examples to show if the statement is always, sometimes or never true. How do you know?

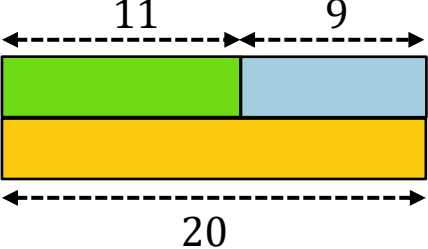
<b>Pack q:</b> Addition key facts	
<b>Session A:</b> Addition and subtraction	
<b>Resources needed:</b> Cubes	
<p>The purpose of this session is to understand the relationship between addition and subtraction. As well as to understand that addition is commutative, it can be completed in either order. Get pupils showing with cubes, saying in words and writing calculations to demonstrate their understanding.</p>	
<p><b>Talk Task</b>          Use seven cubes to show and write addition and subtraction calculations.          During this process draw out the relationship between addition and subtraction moving the cubes to show and writing calculations.          For example, if I know <math>5 + 2 = 7</math> then I know <math>7 - 5 = 2</math> and <math>7 - 2 = 5</math>.          Challenge understanding of the equals symbols by discussing that you can record the 'answer' on the left e.g. <math>4 = 7 - 3</math> or have an operation on both sides e.g. <math>3 + 4 = 2 + 5</math>.          Include discussions about examples that involve zero and explore examples with more than two parts as prompted by the images.          Draw attention to examples that show that addition can be completed in any order e.g. <math>3 + 4 = 4 + 3</math>          Discuss that the word <i>commutative</i> is used to describe this. Look at the models and ask pupils to talk about how each one shows addition is commutative. Ask them to use the word commutative in their explanation  <i>This model shows that addition is commutative because...</i>          Ask pupils to think about the facts that this is always true, for any addition calculation. The use of letters is a way to describe this. The letters can represent any number and you can talk about them in the same way as the other models.  <i>Why can't you move the numbers in a subtraction calculation in the same way?</i>          Ask pupils to give examples to support their explanation of this.</p>	
<p><b>Activity</b>          The activity sheet has models for pupils to interpret and describe with calculations.          The true or false task challenges the idea that the numbers in a calculation can be moved around to any position.</p>	<p>Video guidance to follow</p>



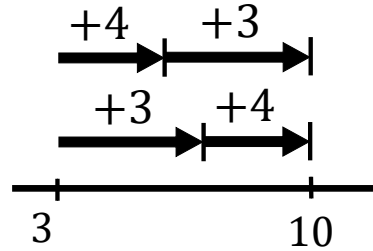
Pack 1 Session A

**Activity:** Addition and subtraction

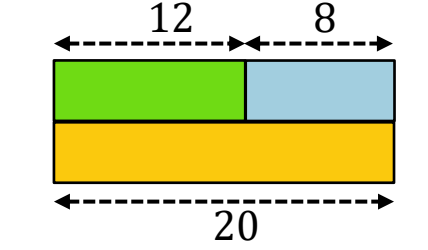
1) Complete the calculations that each model can represent



	$11 + 43 = 20$	$20 - 5 = 9$
	$9 + 11 = 100$	$20 - 43 = 11$

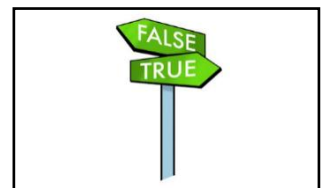


	$3 + 4 + 3 = 10$	$10 - 3 - 4 = 3$
	$3 + 3 + 4 = 10$	$10 - 4 - 3 = 3$



	$12 + 8 = 20$	$20 - 8 = 12$
	$8 + 12 = 20$	$20 - 12 = 8$

2) Can you move the numbers around to any position?  
Circle the calculations that are true.



- |             |             |             |
|-------------|-------------|-------------|
| $3 + 4 = 7$ | $4 + 3 = 7$ | $7 + 3 = 4$ |
| $3 + 7 = 4$ | $4 + 7 = 3$ | $7 + 4 = 3$ |
| $3 - 4 = 7$ | $4 - 3 = 7$ | $7 - 3 = 4$ |
| $3 - 7 = 4$ | $4 - 7 = 3$ | $7 - 4 = 3$ |

<b>Pack 1:</b> Addition key facts	
<b>Session B:</b> Key facts to 10	
<b>Resources needed:</b> Dienes ones, tens and hundreds	
The purpose of this session is to explore key addition facts for all numbers up to 10 and how these can be used. The relationship between addition and subtraction should be a focus as well as extending to use with larger numbers.	
<p><b>Talk Task</b></p> <p>A grid is provided that shows addition facts for numbers up to 10. These are all facts that can be shown with your fingers. Ask pupils to talk to you about the grid: how to read it, if they can give more information, if there are any patterns they notice.</p> <p>Choose some calculations and discuss the related subtraction facts using Dienes blocks to move and show the relationship to the addition fact.</p> <p>Discuss the yellow boxes in the grid and what pupils notice about these. This should involve a discussion about the number ten: how to write it and why it has two digits. Use Dienes to show that ten ones is equal to one ten.</p> <p>The rest of the session focuses on how to use key facts to calculate with larger numbers.</p> <p>Create the images of Dienes tens and ones to explore how <math>5 + 3 = 8</math> can be used to complete related facts. Record addition and subtraction facts for each row of Dienes blocks in the image.</p> <p>The speech bubbles show how to use a know fact to find related facts where the parts are ten times or a hundred times greater. Use Dienes or draw images of Dienes to explore addition and subtraction facts. For example,</p> $50 + 30 = 80 \quad 30 + 50 = 80 \quad 80 - 50 = 30 \quad 80 - 30 = 50$ <p>Saying the name of the place the digit is in helps make a clear link to the key fact e.g. <i>five tens add three tens is eight tens.</i></p> <p>Extend the activity by repeating similar experiences with other key facts.</p>	
<p><b>Activity</b></p> <p>The activity sheet has addition and subtraction facts with missing numbers that show chains of related facts and then asks pupils to generate similar calculations.</p> <p>The robot task connects addition and subtraction with movement on a number line.</p>	<p>Video guidance to follow</p>



**Activity:** Key facts to 10

1) Complete the calculation to show how a key fact can be used:

$$4 + 5 = 9$$

$$5 + 4 = 9$$

$$14 + 5 = 19$$

$$50 + 40 = 90$$

$$29 - 5 = 24$$

$$90 - 40 = 50$$

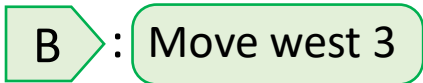
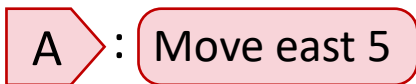
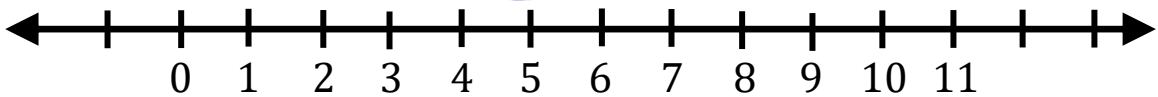
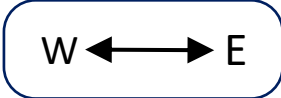
$$79 - 4 = 75$$

$$90 - 50 = 40$$

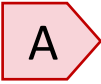
2) Write calculations that  $6 + 2 = 8$  can be used to work out.

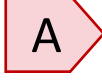
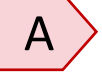
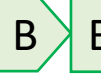

$16 + 2 = 18$	$96 + 2 = 98$	$58 - 2 = 56$
$6 + 32 = 38$	$6 + 72 = 78$	$98 - 6 = 92$
$80 - 20 = 60$	$60 + 20 = 80$	$80 - 60 = 20$

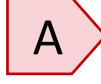
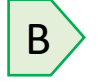
And many more

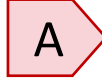
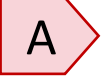
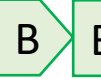




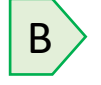
3) This robot has two different instructions. Use A and B to move the robot from position 5 to each of these numbers. Write a calculation to describe the movement. An example is given:

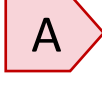
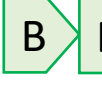


⑩   $5 + 5 = 10$

⑨      $5 + 5 + 5 - 3 - 3 = 9$

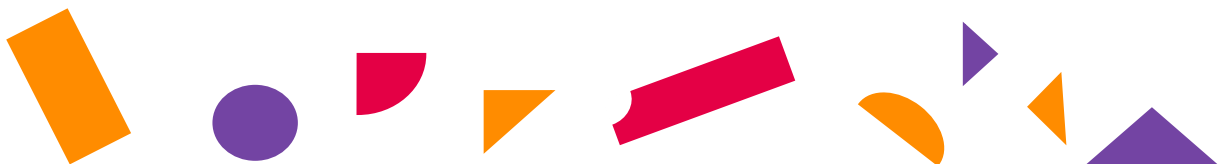
⑦    $5 + 5 - 3 = 7$

⑥       $5 + 5 + 5 - 3 - 3 - 3 = 6$

②   $5 - 3 = 2$

①      $5 + 5 - 3 - 3 - 3 = 1$

<b>Pack 1:</b> Addition key facts	
<b>Session C:</b> Key facts to 20	
<b>Resources needed:</b> Dienes ones, tens and hundreds	
<p>The purpose of this session is to explore key addition facts for all numbers up to 20 and how these can be used. The relationship between addition and subtraction should be a focus as well as extending to use with larger numbers.</p>	
<p><b>Talk Task</b></p> <p>The same grid as the previous session is provided but this time with more information. Ask pupils to discuss what has changed and repeat a similar discussion as before about more information they can give and any patterns that they notice.</p> <p>Choose some calculations and discuss the related subtraction facts using Dienes blocks to move and show the relationship to the addition fact. The facts with a result greater than ten will involve regrouping and you should discuss the 'Make 10' strategy. For example, <math>7 + 5 = 7 + 3 + 2</math>. The 5 is partitioned, 7 and 3 make 10 and there are 2 more. Use Dienes to show the steps of this strategy, regrouping ten ones for one ten and exploring other examples.</p> <p>The rest of the session focuses on how to use key facts to calculate with numbers ten times greater, with totals within 100.</p> <p>Create the images of Dienes tens and ones to explore how <math>3 + 4 = 7</math> can be used to complete related facts. Record addition and subtraction facts for each row of Dienes blocks in the image.</p> <p>The speech bubbles show how to use a known fact to find related facts where the parts are ten times greater. Use Dienes or draw images of Dienes to explore addition and subtraction facts related to each. For example,</p> $30 + 40 = 70 \quad 40 + 30 = 70 \quad 70 - 30 = 40 \quad 70 - 40 = 30$ <p>Saying the name of the place the digit is in helps make a clear link to the key fact e.g. <i>seven tens subtract three tens is equal to four tens.</i></p>	
<p><b>Activity</b></p> <p>The activity sheet has addition and subtraction facts with missing numbers that show chains of related facts and then asks pupils to generate similar calculations.</p> <p>The 'Sum four' task is more open and has plenty of opportunity to explore calculations.</p>	<p>Video guidance to follow</p>



**Activity:** Key facts to 20

1) Complete the calculation to show how a key fact can be used:

$$4 + 7 = 11$$

$$9 + 5 = 14$$

$$34 + 7 = 41$$

$$5 + 9 = 14$$

$$41 - 7 = 34$$

$$14 - 5 = 9$$

$$51 - 7 = 44$$

$$14 - 9 = 5$$

2) Write calculations that  $8 + 7 = 15$  can be used to work out.

$$18 + 7 = 25$$

$$28 + 7 = 35$$

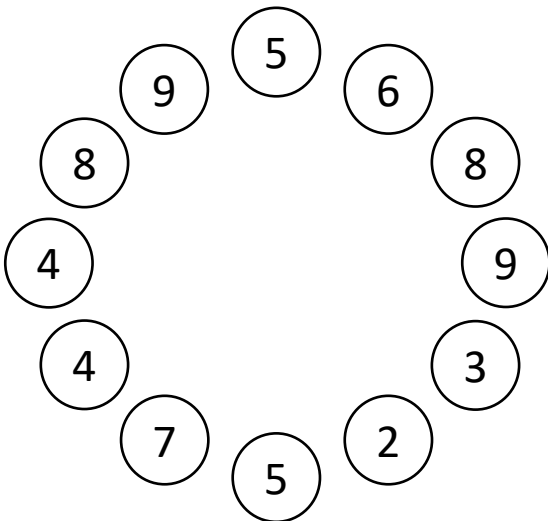
$$45 - 7 = 38$$

$$15 - 7 = 8$$

And many more

$$15 - 8 = 7$$

3) Sum three numbers.



Write different calculations you did

calculations with 3 of  
the numbers added

Which is the largest?

26

Which is the smallest?

9

Write the odd numbers you can make:

Write the even numbers you can make:

What else can you say about the numbers you can get? Multiple of 3 or 5?



<b>Pack 1:</b> Addition key facts	
<b>Session D:</b> Modelling problems	
<b>Resources needed:</b> Resources for drawing or building bar models	
<p>The purpose of this session is to explore problems involving addition and subtraction. The focus is on how a slight difference in language can change the structure of the problem and that being able to draw a model helps understand this structure and decide what to do.</p>	
<p><b>Talk Task</b></p> <p>There are six word problems all with a similar situation of two children with marbles and there are four bar models. The two questions at the bottom of the sheet do not have a bar model draw for them. Cut up the problems and bar models and you can decide if you want to include the two problems without bar models to make it more challenging or if you want to keep them separate until the end.</p> <p>Read the questions and discuss the similarities. Discuss which problem can be represented by which bar model and how you know.</p> <p>There are two different types of bar models, one where two parts are put together and another where two bars are compared. Connect each problem to the chosen bar model by labelling the known information and deciding what to do to work out the answer.</p> <p>The last two questions can then be used to draw a model that could represent them. Some useful questions to think about:</p> <p><i>What information do I know? How can I show what I know?</i></p> <p><i>What information am I trying to find out?</i></p> <p><i>How can I show the relationships between what I know and what I am trying to find out?</i></p>	
<p><b>Activity</b></p> <p>The activity sheet provides similar experiences of engaging with addition and subtraction problems and building bar models to represent these.</p>	<p>Video guidance to follow</p>



Pack 1 Session D

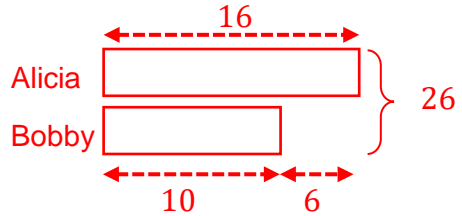
Answers

**Activity:** Regrouping

1) Draw and label a bar model to represent each problem. Give an answer to each question.

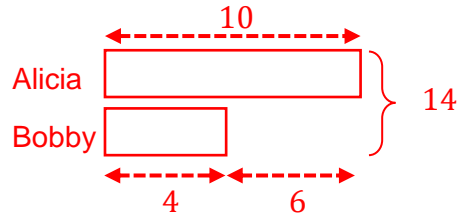
Alicia has £6 more than Bobby. If Bobby had £10, how much do they have altogether?

Alicia and Bobby have £26.



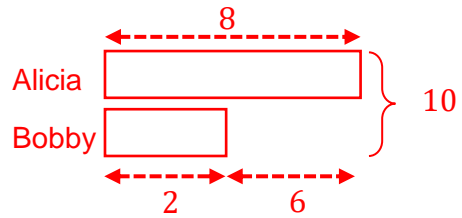
Alicia has £6 more than Bobby. If Alicia had £10, how much do they have altogether?

Alicia and Bobby have £14.



Alicia has £6 more than Bobby. If they had £10 altogether, how much money does each person have?

Alicia has £8 and Bobby has £2.

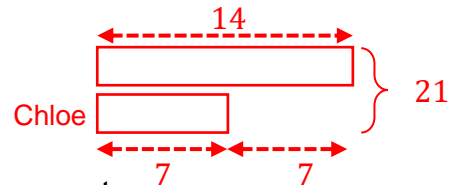
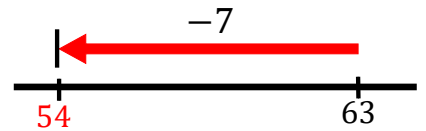
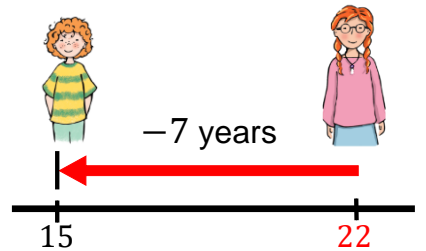


2) Label the models to represent each problem and draw a model for the last question

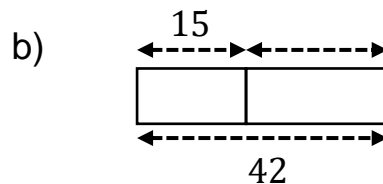
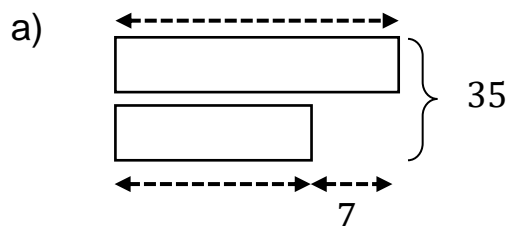
a) Chloe is seven years younger than her sister. When she is 15, how old is her sister?

b) When her sister is 63, how old will she be?

c) How old will they both be when they have a combined age of 21?



3) Write a problem that each bar model could represent



A suitable problem that has two values with a difference of 7 and a total of 35

A suitable problem that has two values with a total of 42 where one value is 15

<b>Pack 2:</b> Multiplication and division	
<b>Session A:</b> Describing equal groups	
<b>Resources needed:</b> Counters	
<p>The purpose of this session is to explore the language and symbols of multiplication and division when describing equal groups. Groups of counters are used to show that multiplication is commutative and to explore the relationship between multiplication and division.</p>	
<p><b>Talk Task</b></p> <p>Discuss the images of counters and ask pupils to describe what they see and notice. Look at each model in turn and ask pupils to explain how it can be used to show each of the four multiplication and division calculations below it.</p> <p>Use counters to create the model and take the time to attach each number within the calculation to the model. Encourage pupils to move the counters as they explain. Example of language for first model:</p> <ul style="list-style-type: none"> <li>• <math>3 \times 4 = 12</math>    <i>There are 3 groups. There are 4 counters in each groups. There are 12 counters altogether.</i></li> <li>• <math>4 \times 3 = 12</math>    <i>A group of 4 counters multiplied by 3 is 12 counters</i></li> <li>• <math>12 \div 3 = 4</math>    <i>12 is split into 3 equal groups. There are 4 in each.</i></li> <li>• <math>12 \div 4 = 3</math>    <i>12 is split into groups of 4. There are 3 groups.</i></li> </ul> <p>Having looked at each model, look at the whole sheet and ask pupils to tell you what they know about multiplication and division. Listen and discuss what they say.</p> <p>Points to include in the discussion throughout the session:</p> <p>Multiplication and division are related, there is a doing and undoing relationship. If I know a multiplication fact, I also know division facts.</p> <p>Multiplication is commutative. The order in which you multiply does not change the result. Pupils may have a fixed way of reading a multiplication calculation and you want to help them be flexible and think about <math>5 \times 2</math> as 2 groups of 5 or as 5 groups of 2 because these have the same value.</p>	
<p><b>Activity</b></p> <p>The activity prompts similar experiences of describing and creating groups of counters. Then the context of seats around tables is used to apply understanding in a different situation. The final question has more than one possible answer.</p>	<p>Video guidance to follow</p>

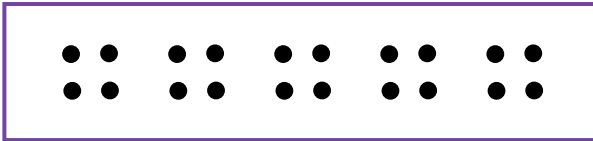
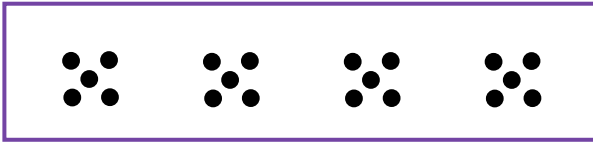


Pack 2 Session A

**Activity:** Describing equal groups

*Answers*

1) Write four calculations to describe the counters



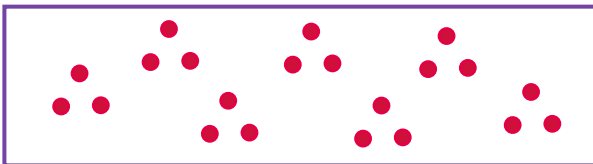
$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

$$20 \div 5 = 20$$

$$20 \div 4 = 20$$

2) Draw two different sets of counters to show the calculations



$$3 \times 7 = 21$$

$$7 \times 3 = 21$$

$$21 \div 7 = 3$$

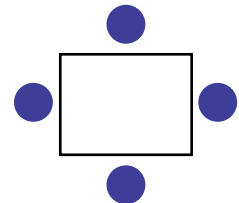
$$21 \div 3 = 7$$

3) Table arrangements

a) Between 30 and 40 people are sat at tables of 4. All the tables are full.

How many tables could there be?

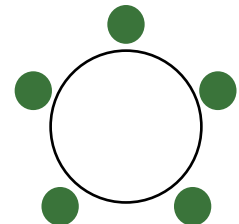
8 tables is 32 people, 9 tables is 36 people and 10 tables is 40 people



b) Between 40 and 60 people are sat at tables of 5. All the tables are full

How many tables could there be?

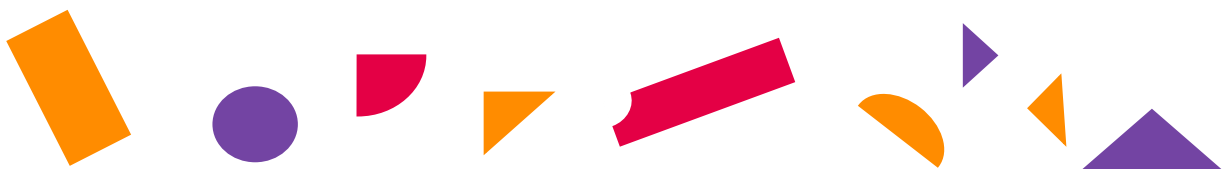
There could be between 8 and 12 tables



c) I need to seat 47 people. What are my options with the tables shown above?

10 tables of 5 with 3 spare seats  
12 tables of 4 with 3 spare seats  
9 tables of 5 and a table of 4 with 2 spare seats

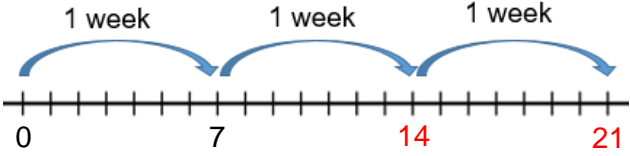
<b>Pack 2:</b> Multiplication and division	
<b>Session B:</b> Multiplication situations	
<b>Resources needed:</b> Counters	
<p>The purpose of this session is to explore situations involving multiplication and division and models that can be used to represent them. Building confidence with interpreting and building models will allow pupils to use them to make sense of mathematical situations and support understanding of calculation strategies.</p>	
<p><b>Talk Task</b></p> <p>The talk mat has four models and four word problems. Start by discussing the models and encourage pupils to describe what they can see. Think about the multiplication and division calculations these could represent and write them out.</p> <p>Read a word problem and discuss which model can be used to represent the problem. Discuss that often there will be more than one possible model.</p> <p>Spend time describing how the model represents the problem i.e. what each part of the model means in the problem. For example, <i>The counters can represent the sugar problem. Each counter is 1 kg of sugar. 12 kg is shared into 3 equal groups, there are 4 kg in each group.</i></p> <p>Discuss which calculation can be used to find a solution to each problem encouraging students to think about when there can be more than one answer. For example, a problems involving division can be thought of as multiplication with an unknown factor. <i>This problem is asking how many lots of 4 minutes are there in 12 minutes. I can think of this as <math>4 \times \underline{\quad} = 12</math></i></p> <p>Ask pupils to give a full sentence answer to the questions asked in each problem.</p> <p>The problem involving money has the language ‘times as much’ to compare two amounts. When choosing a model, ask pupils to think about how much money there is altogether. This will draw attention to the two amounts that are being compared and so the model with two bars is a logical choice. The other models can be used and they show the amount the brother has. Times greater is the focus of session D</p>	
<p><b>Activity</b></p> <p>The activity prompts similar experiences of interpreting word problems and models. Some of the word problems have gaps to be completed. Pupils are to record calculations that are useful for finding a solution and write a full sentence answer to the question asked in the answer box.</p>	<p>Video guidance to follow</p>





## Pack 2 Session B

### Activity: Multiplication situations

Complete the images models and calculations and answer the question.

<p><b>Problem:</b> How many <b>days</b> are there in <b>3</b> weeks?  How many weeks is <b>21</b> days?</p>	<p><b>Model:</b></p> 
<p><b>Calculations:</b> <math>3 \times 7 = 21</math>      <math>7 \times 3 = 21</math>  <math>21 \div 3 = 7</math></p>	<p><b>Answer:</b> There are <b>21</b> days in 3 weeks.  21 days is <b>3</b> weeks.</p>

<p><b>Problem:</b> The total mass is 24 kilograms. Each weight is 4 kilograms in mass. How many weights are there?</p>	<p><b>Model:</b></p> 
<p><b>Calculations:</b> <math>24 \div 4 = 8</math>  <math>4 \times 8 = 24</math></p>	<p><b>Answer:</b> <b>There are 6 weights.</b> <b>24 kg is 6 weights with mass of 4 kg.</b></p>

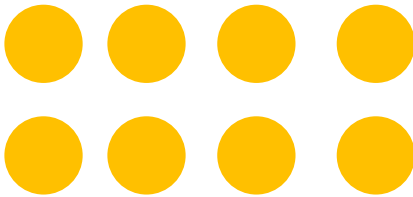
<p><b>Problem:</b> 18 litres is poured into 3 buckets so that there are equal amounts in each. How much liquid is in each bucket?</p>	<p><b>Model:</b></p> 
<p><b>Calculations:</b> <math>6 \times 3 = 18</math>      <math>3 \times 6 = 18</math>  <math>18 \div 3 = 6</math></p>	<p><b>Answer:</b> <b>There are 6 litres in each bucket.</b> <b>18 litres is 3 buckets of 6 litres.</b></p>

<b>Pack 2: Multiplication</b>	
<b>Session C: Arrays</b>	
<b>Resources needed:</b> Counters	
<p>The purpose of this session is to explore arrays and see the connection between multiplication and division. You want to establish a clear understanding as to how one array can be described in many different ways.</p>	
<p><b>Talk Task</b></p> <p>An array is when objects are arranged in rows and columns. Start with arrays of counters and ask: <i>What is the same and what is different?</i></p> <p>Create the first array with counters and discuss the corresponding equations. Make connections to the learning from Session A, using the same language to describe the multiplication and division calculations. Consolidate the relationship between multiplication and division and that multiplication is commutative. That the operation on two numbers can be done in either order (link with experience in session A)</p> <p>Create the second array with counters and discuss the corresponding multiplication and division calculations. Remember to make the connections and discuss the relationships outlined above.</p> <p>Now explore <i>what is the same and what is different?</i> Encourage pupils to compare the second array with the first array. Possible discussion points include:</p> <ul style="list-style-type: none"> <li>-Comparing the value of the whole</li> <li>-Comparing the value of the parts</li> <li>-Comparing the number of parts</li> </ul> <p>Extend the activity by asking pupils to create their own arrays and corresponding multiplication and division equations.</p>	
<p><b>Activity</b></p> <p>The activity has three arrays for pupils to describe. They should consider and record the multiplication and division calculations that the arrays can represent.</p>	<p>Video guidance to follow</p>



**Activity:** Multiplication and arrays

How many squares does each rectangle cover (even if you can't see them)?  
Write calculations that each rectangle can represent.

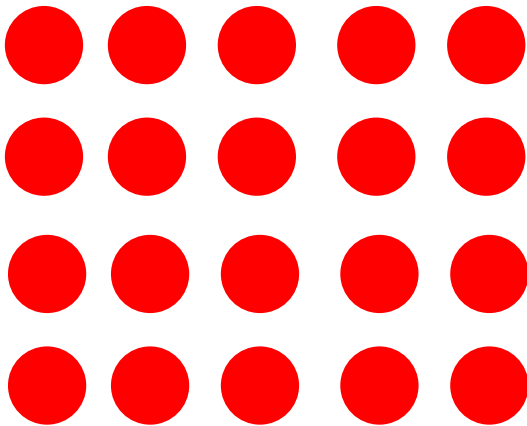


$$2 \times 4 = 8$$

$$4 \times 2 = 8$$

$$8 \div 2 = 4$$

$$8 \div 4 = 2$$

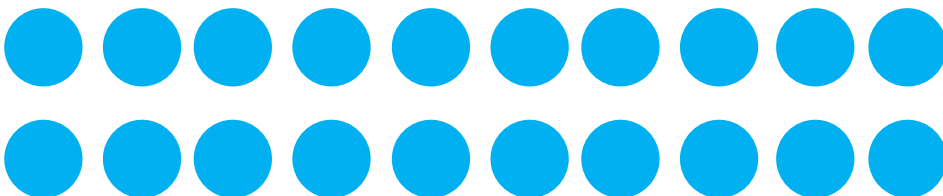


$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

$$20 \div 5 = 4$$

$$20 \div 4 = 5$$



$$2 \times 10 = 20$$

$$10 \times 2 = 20$$

$$20 \div 2 = 10$$

$$20 \div 10 = 2$$



<b>Pack 2:</b> Multiplication	
<b>Session D:</b> Multiplication to compare	
<b>Resources needed:</b> Counters	
<p><b>Talk Task</b></p> <p>The purpose of this Talk Task is to explore experiences where multiplication is used to compare two values. This involves using language such as ‘times greater’, ‘times as much’ or ‘times as many’. This can also involve using the language of fractions and pupils should be encouraged to think about how to use the phrases ‘a third of the amount’ and ‘a quarter of...’ etc.</p> <p>The first activity on the talk mat shows two people with different amounts of money and speech bubbles with statements. Ask pupils to describe the image and discuss which person says which statement.</p> <p>Notice the variety of language used and check pupils are comfortable with using. Move on to look at the arrows above a number line and encourage pupils to add more information to the model. Think about how to use similar language as before to describe the arrows.</p> <ul style="list-style-type: none"> <li>• <i>The grey arrow is 4 times greater than the black arrow</i></li> <li>• <i>The black arrow is a quarter of the length of the grey arrow</i></li> </ul> <p>Encourage them to think of situations that could be represented with this model. For example, my bus journey takes 6 minutes and my friend’s journey is four times longer.</p> <p>Encourage students to draw their own models and images and continue to explore the language.</p> <p>For example:</p> <p><i>An elastic band is stretched from 3 cm to 6 cm. We can say the length is 2 times as long.</i></p> <p><i>A stack of 4 boxes is 4 times as tall as the height of one box</i></p>	
<p><b>Activity</b></p> <p>The activity sheet provides situations where students can apply their understanding of multiplication to compare.</p> <p>The final problem challenges pupils to use multiplication to describe a situation which is not as straight forward as the others. Prompt them to compare the price and the amount.</p>	<p>Video guidance to follow</p>



**Activity:** Using multiplication to compare

- 1) Use multiplication to compare the amount each person has. What different sentences could each person say?

I have 3 times more than him  
 £21 is 3 times more than £7  
 I can buy something that costs 3 times as much

He has 3 times more than me  
 I have a third of the amount he has  
 I would need to triple my amount to have the same as him



2) An adult giraffe is 18 feet tall.  
 It is 3 times taller than its calf.

How tall is the young giraffe?  
 Label the model and write a sentence

The giraffe is 6 feet tall

3) A pack of 3 yoghurts cost £2.  
 A pack of 12 yoghurts costs £6.

Use multiplication to describe this situation in as many ways as you can.

There are 4 times more yoghurts in the 12 pack

The 12 pack costs 3 times the price

The 3 pack is a third of the price of the 12 pack

The 3 pack is a quarter of the amount of yoghurts than the 12 pack

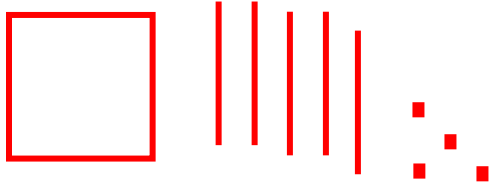
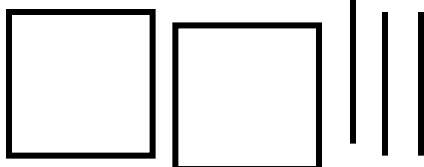
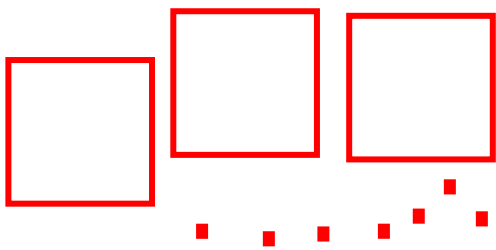
<b>Pack 3:</b> Number	
<b>Session A:</b> Counting and grouping	
<b>Resources needed:</b> Dienes thousands, hundreds, tens and ones	
<p>The purpose of this session is to get pupils talking and thinking about numbers, what they can mean and how we write them. You want to explore what pupils understand about how our number system works.</p>	
<p><b>Talk Task</b>            Use the images to discuss numbers and think about where and why they are used. Is it to count, measure, label, order, ...? Encourage pupils to include their own examples.</p> <p>Ask pupils to think about how they would try to work out how many people there are in the school (adapt to a familiar place with lots of people if this isn't suitable for your setting). Going through the process of thinking about this will probably involve grouping the people in some way rather than thinking about each individual, e.g. there are __ teachers, there are __ children in each class,....</p> <p>Connect this experience of grouping things in order to count them with the way we write numbers. Our number system uses grouping. Discuss what they know about our number system and how it works. We use 10 digits and with them we can write any number you can think of!</p> <p>Ask pupils to count from zero and show with Dienes. When they reach ten what do they do? Continue to the number 13 and ask pupils to write the number down. How can we use the Dienes blocks to show what the digits mean? The blocks allow you to see the relationship between each place in the number system. That ten ones is equal to one ten. That ten tens is equal to one hundred.</p> <p>Count and build from 88 to 111. Stop every now and again and think about how to record the number you are on in digits and written words. Connect the abstract digits to the Dienes and the spoken sounds.</p> <p>Count in steps of 1, 10 or 100 from different starting points both forwards and backwards.</p>	
<p><b>Activity</b>            The activity prompts connection of different representations of number that focus on place value understanding. Pupils complete a table showing a number with digits, words and Dienes. They then consider counting in steps of ten starting from 56.</p>	<p>Video guidance to follow</p>



**Activity:** Counting and grouping

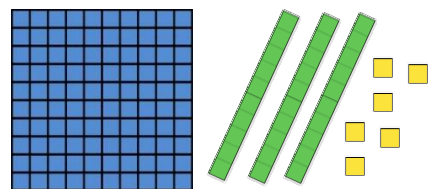
*Answers*

1) Complete the table to show each number with Dienes and in words.

number	Dienes	words
154		One hundred and fifty four
230		Two hundred and thirty
307		Three hundred and seven

2) If you count in steps of 10 starting at 56, will you say these numbers?  
Tick the ones you will say. What other numbers would you say?

Ninety six

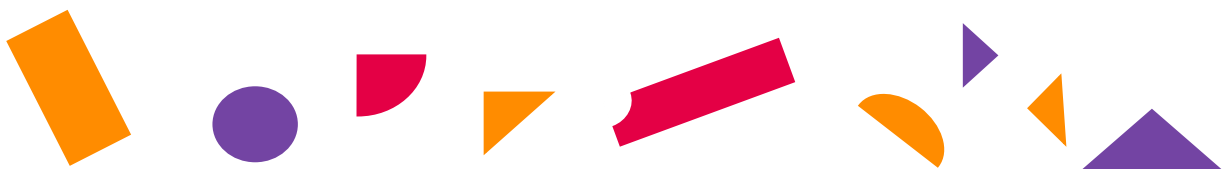


106

Two hundred  
and twenty six

Any value greater  
than 56 with a 6 in  
the ones place

<b>Pack 3:</b> Number	
<b>Session B:</b> Value of the place	
<b>Resources needed:</b> Dienes hundreds, tens and ones. Small pieces of paper.	
<p>The purpose of this task is to get pupils think about the fact that we use a place value number system: that the same digit can have a different value if it is in a different place.</p>	
<p><b>Talk Task</b> Use three digits to explore how many different numbers can be made.</p> <p>Examples are provided on the Talk Task sheet to prompt discussion. Build each number with Dienes, draw pictures of the Dienes and choose some numbers to write in words.</p> <p>It would be useful to be able to write each number on small pieces of paper so they can be moved around, compared and ordered.</p> <p>Explore 1-digit, 2-digit numbers and then 3-digit numbers. <i>How might we know if we have made all the possible numbers?</i></p> <p>Challenge pupils to think about how to explain that they have found them all. Encourage pupils to place them in order or group them by their starting (or first) digit to help convince themselves and you that there are no more options.</p> <p>13, 14, 31, 34, 41, 43, 134, 143, 314, 341, 413, 431</p> <p>Having made different numbers with the same digits, discuss and compare them focusing on how the value of the digit is different if it is in a different place.</p> <p><i>In the number 134, the digit 4 has a value of 4 ones. In the number 143, the digit 4 has a value of 4 tens. In 413, the digit 4 has a value of 4 hundreds.</i></p> <p>Sort the numbers in different ways. For example, odd and even, greater than 200 and less than 200, etc.</p> <p>Extend the task by introducing a zero and exploring the options for the numbers that can be made.</p>	
<p><b>Activity</b> The activity sheet guides students through similar experiences of using digits to write numbers and generating examples and non-examples of numbers with a given description.</p>	<p>Video guidance to follow</p>



**Activity:** The value of the place

1) Use these digits to create numbers for each of the properties



a) A number less than 100

54, 52, 45, 42, 24, 25

b) A number greater than 300

542, 524, 452, 425

c) An even number

542, 524, 452, 254, 54, 52,  
42, 24d) A number that you can show  
with 7 Dienes blocks

52, 25

e) An odd number

425, 245, 45, 25

2) There are many ways to complete

	Examples	Non-examples
A number with 4 tens that is greater than 500	1420 3456	1320 425
An even number with 3 hundreds	346 346	325 458
A number with 6 ones that is greater than 100 but less than 200	106 196	195 206

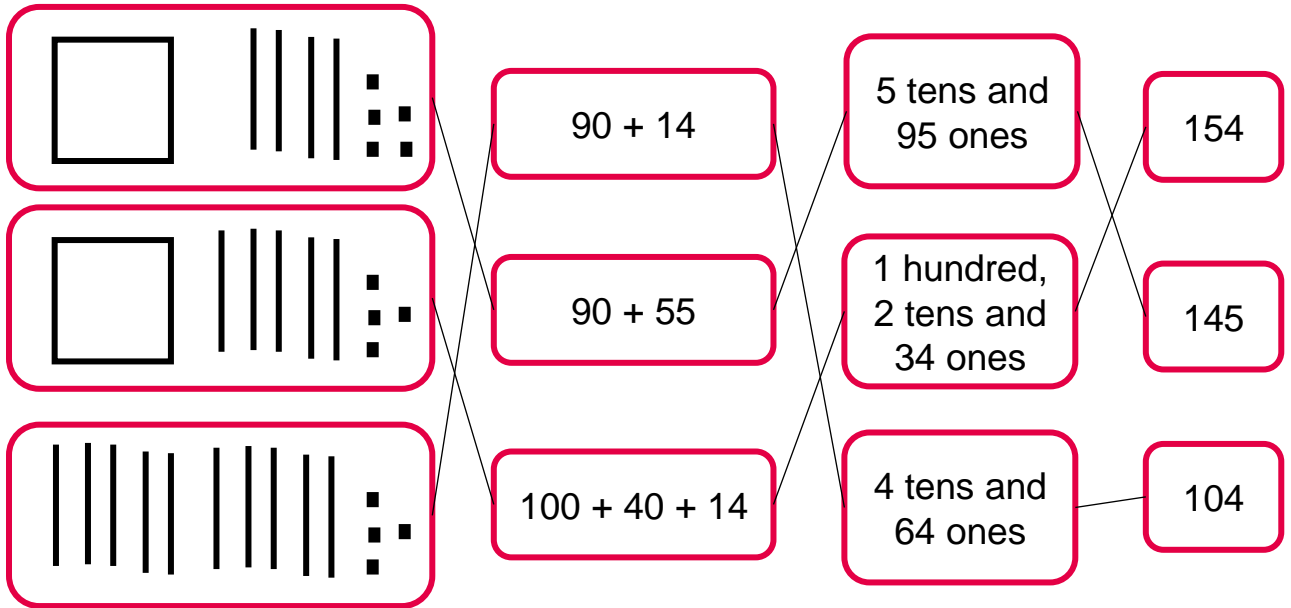
<b>Pack 3:</b> Number	
<b>Session C:</b> Regrouping	
<b>Resources needed:</b> Dienes (at least 2 hundreds, 13 tens, 13 ones)	
<p>The purpose of this session is to explore different ways the same number can be grouped. Being able to see numbers in lots of different ways supports being able to calculate flexibly.</p>	
<p><b>Talk Task</b></p> <p>There is a lot of information on the Talk Task sheet so fold it and look at each set of coins in turn. Discuss the relationships between the coins: that ten 1p coins is 10p, that £1 is the same as 100p or ten 10p coins.</p> <p>For each set of coins, write down the value of each coin type in pence, discussing how you know and building models with Dienes to show and explain.</p> <ul style="list-style-type: none"> <li>• 100p + 110p + 3p</li> <li>• 200p + 13p</li> <li>• 100p + 100p + 13p</li> </ul> <p>Connect this experience to understanding our number system: that 10 ones is equal to 1 ten and that 10 tens is equal to 1 hundred.</p> <p>Having looked at each set of coins, take time to look at them together and think about what is the same and what is different. Encourage pupils to think of as many different answers as they can.</p> <p>The three sets of coins all have the same value of 213 pence or £2.13. None of these is the most efficient way of showing 213 pence. Ask pupils to show 213 pence with the fewest number of coins. Notice how it matches the written number with 2 hundreds, 1 ten and 3 ones</p> <p>Extend the activity by thinking about other ways the number 213 can be grouped and calculations that can be written.</p>	
<p><b>Activity</b></p> <p>The activity sheet starts with the challenge of matching representations of three different numbers. Then pupils complete empty boxes in calculations. There are lots of patterns to find and extend within this task and you can encourage pupils to look for these. They should create more examples for each number. Extend the activity by selecting other numbers to explore.</p>	<p>Video guidance to follow</p>



Pack 3 Session C  
**Activity:** Regrouping

*Answers*

1) Match the representations

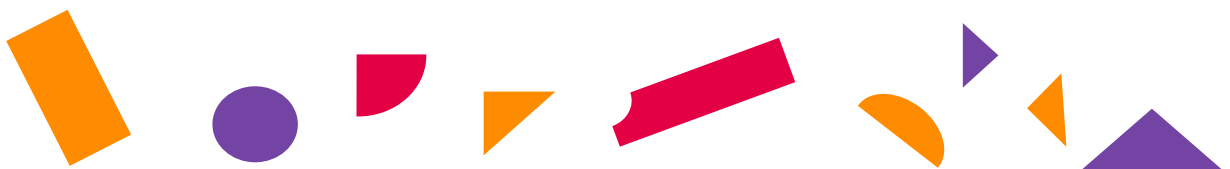


2) Fill in the blanks to show each number in different ways. How many more can you think of?

- |         |         |               |
|---------|---------|---------------|
| 42      | 84      | 168           |
| 40 + 2  | 80 + 4  | 100 + 60 + 8  |
| 30 + 12 | 60 + 24 | 100 + 50 + 18 |
| 20 + 22 | 50 + 34 | 100 + 40 + 28 |
| 21 + 21 | 51 + 33 |               |
|         |         | 90 + 70 + 8   |
| 10 + 32 | 30 + 54 | 90 + 60 + 18  |
| 33 + 9  | 20 + 64 | 90 + 50 + 28  |
|         | 10 + 74 |               |
|         |         | 80 + 80 + 8   |



<b>Pack 3:</b> Number	
<b>Session D:</b> Build and adjust	
<b>Resources needed:</b> Dienes, 10 ones, 10 tens, 10 hundreds and 1 thousand	
The purpose of this session is to play with numbers and think about what can and cannot happen when you restrict or adjust.	
<p><b>Talk Task</b></p> <p>Use exactly ten Dienes blocks to build numbers and explore the different numbers that can be shown with 10 blocks. Choose from ones, tens or hundreds and extend to thousands if appropriate.</p> <p>Record the numbers and images of the numbers. There are plenty of opportunities for finding and extending patterns when generating examples.</p> <p>Remember to include non-examples by discussing the numbers that cannot be shown with exactly ten blocks.</p> <p>Having generated lots of examples, choose a few examples and think about what could happen if you adjust the model. Add one more block and explore possible outcomes. Take away a block and explore possible outcomes.</p> <p>Draw attention to which digits change and how they change to connect to the next section.</p> <p>Discuss and explore how the digits change when 10 is added to a number. Which digit will always change, which will never change and which will sometimes change? Create examples to support conclusions.</p> <p><i>The digit in the ones place will never change.</i></p> <p><i>The digit in the tens place will always change.</i></p> <p><i>The digit in the hundreds place will sometimes change.</i></p>	
<p><b>Activity</b></p> <p>The activity sheet guides students through similar tasks of creating numbers with five Dienes blocks and thinking about how the digits change when one is added.</p> <p><i>The digit in the ones place always changes.</i></p> <p><i>The digit in the tens place sometimes changes.</i></p> <p><i>The digit in the hundreds place sometimes changes.</i></p>	<p>Video guidance to follow</p>



**Activity:** Build and adjust1) Draw and write numbers with **exactly five Dienes blocks**

113



32

5, 14, 41, 23, 50

104, 122, 131, 140, 203, 212, 221, 230,

302, 320, 401, 410

2) Circle always, sometimes or never and give examples to support your answer.

 always sometimes never

If you add 1 to a number, the digit in the ones place changes.

 $10+1=11$ ,  $19+1=20$  always sometimes never

If you add 1 to a number, the digit in the tens place changes.

Changes:  $39 + 1 = 40$ Doesn't change:  $38 + 1 = 39$  always sometimes never

If you add 1 to a number, the digit in the hundreds place changes.

Changes:  $199 + 1 = 200$ Doesn't change:  $234 + 1 = 235$

Loved a session?  
Got some ideas for improvements?  
Spotted a typo?

Let us know your feedback [here](#)

