

Is not systematic when sharing into equal groups using a 'one for you' approach; does not use the language of division to describe the process

Opportunity for: developing mathematical language

Resources

- Biscuits, sweets or cubes
- Character toys or smiley faces
- Several sets of number cards (Resource sheets 1 and 2)
- Calculator

Key vocabulary

- | | |
|----------------|---------------------------|
| share between | equal groups |
| share into | same number in each group |
| divide between | fair |
| divide into | |

Teaching activity

Time 10–15 minutes

Explain to the child that today they are going to do some sharing with sweets and biscuits. Today's work will help them to be clearer about what division means. They will be learning some of the important words for division.

Note: In this set of activities just keep to 'divide' or 'share', 'between' or 'into' (sharing model for division). 'Divide by', using repeated subtraction (grouping model for division), is covered in the next set of activities, (7 Y2 \times/\div).

? Can you tell me what you think sharing into equal groups means? Can you show me using these sweets?

Build on what the child says, writing down some of the appropriate words which they use.

Set up a sharing story, such as three children sharing fifteen sweets.

? Can you give them all an equal share?



If necessary, discuss the meaning of 'equal'.

Observe the child closely to see how they do the sharing.

? Can you find the right number cards to put beside each person to show how many sweets they have each?

? Can you tell me what you've done? Let's make a number sentence about what you did.

If the sharing is not systematic, you will need to ask the child to count carefully how many sweets each person has.

? Is it fair? Do they have the same number of sweets each?

If the child still seems confused, gather all the sweets back into one pile and suggest that the child shares them out again, very carefully, to make sure that each person has the same number.

Encourage the child to talk you through what they are doing.

Record for them the numbers and words which they use, perhaps with a small picture of the three children.

Try some other numbers, such as eighteen sweets shared between three people, recording for the child using a wide range of division vocabulary.

It is important that they learn to describe the process of division, talking you through all their actions.

Eighteen sweets shared equally between three people makes three groups of six.

Eighteen sweets shared into three groups is six in each group.

If you share eighteen sweets equally between three people, they get six each.

Eighteen sweets divided between three people gives each person six.

If these numbers are too challenging for the child, you might want to stick to sharing between just two people and keep the numbers low until the child is more confident. It is important, though, to develop a wide range of vocabulary during the session.

Try with twenty-one sweets *between* three people and, if the child has become more systematic with sharing using 'one for you', suggest that they move on from giving out one at a time and give out two or more at a time.

? How many sweets do they have each? Are all the groups the same size? How do you know?

'Let's write down what you did. You tell me what to write.'

I started with twenty-one sweets and I divided them between three people. I gave them two at a time until I only had three left. When all the sweets were shared out, they had seven each.

? How many equal groups have you made?

? How many sweets in a group when you divide twenty-one sweets between three people?

? What is twenty-one divided between three?

(Avoid the phrase 'goes into'.)

Show the child a calculator and ask them if they know which key is the division key. If they know, ask them how they would key in twenty-one divided between three.

If the child doesn't recognise the division symbol, demonstrate on the calculator:

$$21 \div 3 = 7$$

Then relate this back to the practical world and their other sentences.

Keep all the sentences and a record of the numbers you have used with the child. These can be displayed, if you have space, or talk them through at another time in class. You will be building up a bank of number sentences and words throughout this teaching sequence.

If there is time, you could ask the child to draw one of the divisions they did.

? What did you learn today?

What were the really important words we used today?



? Write two division sentences in words: one that includes 'between' and another that includes 'into', using $34 \div 2 =$.

Spotlight 1

Is not systematic when sharing into equal groups using a 'one for you' approach; does not use the language of division to describe the process

Opportunity for: solving real-life problems

Dividing between two

Time 15–20 minutes

Resources

- Small character toys or smiley faces
- Items such as sweets, muffins, biscuits, pens
- Paper and coloured pens
- Number sentences from the previous activity
- Number cards 0–20 (Resource sheets 1 and 2)

Key vocabulary

share between	same number in each group
share into	fair
divide between	half
divide into	halving
equal groups	

Teaching activity

'Today we are going to do some sharing between two people using some of the objects on the table.'

Ask the child to show you what they can already do with sharing between two.

Listen to what the child says and note the words that they use, then build on this for the activity. (Again, keep a note of all the numbers which the child uses. These can be used to help the child to learn some divisions by heart.)

Put out two of the character toys and ask the child to count out some pens that they think will share equally between two with none left over. Let them do the sharing and observe their method for doing that.

If the child doesn't recognise that they need an even number of pens, put out the even numbers cards and explain that an even number is needed for two to share (10, 12, 14, 16, 18, 20, and so on). (Make a note to do some work on even numbers at a later date.) Explain that they can put any left-over pens back in the box.

Show how ten divided between two makes five each, but that eleven between two means one pen is left over.

If the child cannot work systematically with the sharing, show them how they could do it, talking through what you are doing. You can extend 'one for you' to 'two (or more) for you' each time.

Record the numbers for the child and talk through what they did.

I started with eighteen pens and I shared them between two people. They have nine each so it is fair. There are two equal groups of nine.

Eighteen divided between two people makes two equal groups of nine.

? Can you think of another way we can talk about sharing between two people?

If the child cannot make the link to halving, ask them if they think each person has half of the pens.

When we shared eighteen pens between two people, we halved eighteen so that each person had half of the number of pens.

Explain that when two people are sharing, the number of things is divided in half. If things are shared among three people they have a third each, not a half.

'If you and I share this muffin, we will have half each.'

If the child doesn't seem to be following, you could do some paper folding into halves, or talk about sharing a pizza, cake or apple.

Move on to using larger numbers of items, but always even numbers, sharing between two. Make a note of all the numbers used.

? Can you share these twenty sweets between two people?

? Can you tell me what you are doing as you do it?

Record again for the child, trying to use a good range of the key vocabulary above.

We shared twenty into two groups, so that gave ten in a group.

We divided twenty into two.

Twenty divided between two means they get half each, which is ten.

You could highlight the key words with a coloured pen, or write the key vocabulary on cards.

? Can you use the words 'divided between' in a number sentence?

If the child is finding this hard, take the key words written on cards into the class so that the child can practise each day for a while using the words.

? When we divided between two today, there were other words we could use as well as 'divided'. Can you remember them?

Finish by showing the child the numbers and the divisions they have done.

? What if we shared eighteen pens among three people? Would they have half each?

If the child cannot see that sharing among three would not mean half each, you will need to do some more dividing of even numbers (four, six, eight, and so on) in half – between you and the child or two of the character toys. Emphasise that 'half' is the word we use to describe what each gets when we share equally between two.



'Write a division story using any numbers you choose, but you must divide between two. Now write it again using the same numbers, but try to use completely different words (you can repeat words like 'the', 'and', 'divide', 'two', and so on). Mark any words you need to repeat and we will see who repeated the fewest.'

Spotlight 2

Is not systematic when sharing into equal groups using a 'one for you' approach; does not use the language of division to describe the process

Opportunity for: reasoning about numbers

.....

Treasure hunt

Time 10–20 minutes

Resources

- Eighteen cubes or character toys
- Six rectangles of paper or model cars
- Sentences from previous activities
- Thirty-six 10p coins (or to suit the child)

Key vocabulary

share between	equal groups
share into	same number in each group
divide between	fair
divide into	

Teaching activity

Explain that today the child is going to solve a problem about a car treasure hunt. Eighteen people want to go on the treasure hunt and six of them want to take their cars. They want to have an equal number of people in each car, so that the teams are fair.

? Can you choose from the things on the table to work out how many people will need to go in each car? Tell me what you are doing as you do it.

If the child finds this too challenging, explain the problem again and suggest what to use to represent the six cars.

? Can you divide the people equally between the six cars so that the teams are fair?

Observe the child sharing to check that they are systematic.

If the child is not sharing systematically, suggest that they need to be more careful. Ask them to count how many there are in each group to make sure it is fair.

If necessary, gather the cubes together and suggest that they share them out again, but more carefully.

? How many people are there in this car now?

? Are there enough for one more person in each car?

? Are all the groups equal? How do you know?

Once you have established that there will be three people in each car, put out the words and sentences from previous activities and ask the child to look for words that they could use to describe what they have done today.

Eighteen people divided into six teams is three people in each team.

We shared eighteen people between six cars and that meant three people in each car.

$$18 \div 6 = 3$$

Eighteen people shared between six cars means that there are three people in each car.

Now extend the activity by saying that one of the teams comes third in the treasure hunt and wins £3.60 in 10p coins. They decide to share it with everyone, all eighteen people (or use an amount of money to suit the child).

? How much money will they get each?

Observe how the child shares the money. Let them do it their own way, sharing between eighteen people, or between the six teams.

If there is time, let the child make their own recording of sharing the money.

Support the child in this sharing, if necessary. Talk about the need to be fair so they must have the same amount of money each.

If they need more practice with sharing money, choose some easy amounts, such as sharing 10p coins between three people.

? What do you think is a key thing to remember for next time?

Spotlight 3

Is not systematic when sharing into equal groups using a 'one for you' approach; does not use the language of division to describe the process

Opportunity for: developing estimation skills

.....

Lots of sweets

Time 10–20 minutes

Resources

- Container with forty-eight sweets or cubes and another with sixty
- Place value (arrow) cards
- Number line
- Two character toys or puppets
- Previous recordings
- Bundles of straws
- Bead strings

Key vocabulary

share between	same number in each group
share into	fair
divide between	half
divide into	halving
equal groups	

Teaching activity

'Today we are going to think about how to share lots of sweets fairly between these two people. This will help you with estimating before you divide the sweets into two groups.'

Show the child the forty-eight sweets without telling them how many there are.



? Can you guess how many sweets there are here?

? Are there more than ten? More than twenty? More than thirty?

Say that we're not going to count them just yet and that the child should think about how they could divide these sweets equally between these two people.

Watch what the child does and build on it.

If they push some sweets to one side and some to the other, you should let them do that and then wait to see if they check that each group has the same number of sweets by counting.

If they start to give them out using the 'one for you' method, you should let them do a few and then point out that they are using a very slow method.

? Can you think of a quicker way of doing that dividing?

Observe what the child does. They might give the sweets out in larger groups.

If the child seems not to have any strategies, you will need to lead them towards the idea of sharing them out in larger numbers than one at a time.



? Do you think there are enough sweets to give the sweets out two at a time? What about five at a time? What about ten at a time?

When the sweets are shared out, support the child in checking each group.

? How can we check that each person has the same number?

If the child doesn't suggest counting them, ask:

? What can we do to find out how many each person has?

Count the sweets with the child. Again, if they count in ones, ask them to think of a quicker way to count.

If the child can't think of a quicker way, suggest counting in twos then putting five of the twos together so you have sets of ten.

Help the child to count: 'ten, twenty and four more in each group makes twenty-four'.

Record what they have done.

Forty-eight divided between
two people is twenty-four
each.

$$48 \div 2 = 24$$

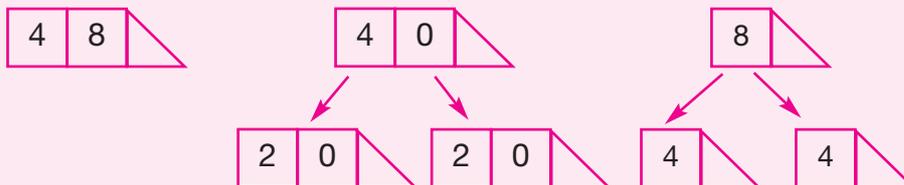
? How many sweets did we start with if we now have two groups of twenty-four?

? How could you find out how many altogether?

Support the child counting on from twenty-four in twos, or putting all of the sweets into groups of ten again: 'ten, twenty, thirty, forty and eight more.'

Put out forty-eight in place value cards and demonstrate the halving and doubling.

Link to finding twenty-four and forty-eight on a 100-square and number line.



You can show the halving with place value cards, if you have time, showing how forty is halved to twenty and eight is halved to four, so half of forty-eight is twenty-four.

It would be helpful to record this on a number line and mark 24 in the middle for the next Spotlight. Model using a bead string.



? So which number comes half way between zero and forty-eight?

If the child cannot see that twenty-four is half-way:

- help them to count along the number line, maybe in twos from zero, establishing that it is 24, then carry on counting in twos to 48;
- show it on the 100-square – from 24 show adding twenty by going vertically two lines, then add four more. (Be aware that children can find it hard to count in ones on a 100-square because they often make a mistake with the starts and ends of lines so end up with the wrong answer!)

? When the people had a fair share each, how many did they have?

Show the child the number sentence you recorded.

'Twenty-four is half-way along between zero and forty-eight.'

Model using a bead string to fold over, reinforcing the equal parts.

Show the container with sixty sweets.

If you are short of time, just ask the child to estimate how many sweets there are and to talk you through how they might divide them equally between two people. Focus on the need to find a quick way to do it, not sharing them out one at a time.

If there is time to divide the sixty sweets, suggest to the child that they share them any way they want. They could count them first, then share them out; or share them, then count to check that the groups are equal.

If the child starts to do 'one for you' stop them and talk them through sharing out maybe two, five or ten at a time.

60 divided equally between
2 is 30 in each group.



? How do you think it helps to estimate how many sweets there are before we share them out?

? What did you learn today about a quicker way to divide?



? If you had a big jar of sweets and you had to share them equally between everyone in the class, what would you do first? Then what? What if there were some sweets left over?

? Of all the ideas people have for how to do it, what might be the quickest way?

Spotlight 4

Is not systematic when sharing into equal groups using a 'one for you' approach; does not use the language of division to describe the process

Opportunity for: recognising relationships between numbers

.....

Dividing with twenty-four

Time 10–20 minutes

Resources

- Two character toys or puppets
- Twenty-four sweets or cubes
- Previous recordings
- 2 cm squared paper

Key vocabulary

- | | |
|----------------|---------------------------|
| share between | equal groups |
| share into | same number in each group |
| divide between | fair |
| divide into | |

Teaching activity

Make a 12×4 rectangle with squared paper. Start with twenty-four sweets in a container. 'Today we are going to do some dividing with these sweets. This is going to help you use words for division, which is important for when you want to share things out to make it fair.'

Remind them about using the forty-eight sweets last time, and show the squared paper with forty-eight squares.

? If we fold this paper with forty-eight squares in half, how many squares will show?

Relate this to the previous number line recording, showing twenty-four as half of forty-eight.

? Do you think twenty-four will divide equally between two with none left over?

If the child can't predict this, remind them about even numbers and how they always share out equally into two groups. Remind them that even numbers end in zero, two, four, six, or eight.

? Is twenty-four an even number? How do you know?

Put out two character toys and observe how the child shares out the twenty-four sweets/cubes equally.

Ask them to tell you what they are doing as they do it.

If the child gets muddled or keeps going with 'one for you' and so on, suggest they give out the sweets in larger groups.

? Are there enough sweets to give them out in tens? Or is that too many at a time? What might be a good number to give out each time?

Encourage the child to make a sensible estimate of how many half of the sweets would be.

**? Can you remember what half of twenty is?
So what might half of twenty-four be? Would it be close to ten?**

This time when you record what they are doing, ask the child to choose some of the words and symbols from previous recordings and you can write these on paper.

divide between
divide into
same number in a group

Support the child in saying number sentences using the words above, for example:

'Twenty-four divided between two makes two equal groups of twelve.'

'Twenty-four divided equally into two makes twelve in each group.'

'If you share out twenty-four equally between two, that makes twelve each, and that is half of twenty-four each.'

? Can you point to the symbol for division in the sentences we wrote last week?

Record the calculation with the division symbol.

$$24 \div 2 = 12$$

? Can you think of another way to read that division sentence?

Finish by asking the child to read to you some of the important words for division.

If you think the child needs more experience with twenty-four, you could divide twenty-four by three in the next session.



? Start at forty-eight and divide between three, so you get to sixteen, then keep dividing between three...

? Keep going. What is the smallest number you can make? (You can use a calculator.)

Spotlight 5: a learning check

Is not systematic when sharing into equal groups using a 'one for you' approach; does not use the language of division to describe the process

Opportunity for: discussing and explaining

Pirate gold

Time 10–15 minutes

Resources

- Cards with the key vocabulary words and any other words for division used by the child
- Yellow or orange cubes
- Number cards: 6, 8, 9, 10, 12, 15 (Resource sheets 1 and 2)
- At least one other child to play

Check: does the child use key vocabulary?

share between	same number in each group
share into	fair
divide between	half
divide into	halving
equal groups	

Teaching activity

'Today we are going to play a game called **Pirate gold**, and we are going to see who wins the most gold. To win gold you must say the division sentences correctly, so this game will help you to be good at talking about division.'

Choose about four or six word cards and read them with the children. Put these cards face up on the table. You can add more cards as the children become more confident.

Note: Emphasise that the amount must be divided *equally* to make it fair.

divided into two

divided into three

divided between two

divided between three

Put the number cards face down on the table and spread them out so that they can be turned over one at a time. When they are turned back, they should be put in the same place as before. Put word cards face up.

How to play

The aim of the game is to win as many pieces of pirate gold (cubes) as possible.

1. Players take turns to turn over a number card and read the number. They then choose one of the word cards (thinking carefully which one is the best for them) and read the whole number sentence. For example:

12

divided between two

'Twelve divided between two makes six in a group.'

The players work out the number sentence using the gold pieces. They must say the sentence correctly – everyone else in the group must listen very carefully to what they say.

2. If everyone agrees that the sentence has been said properly and that the numbers are correct, that player wins all of the pirate gold pieces from one of the answer groups, six in the example given above.

If they say the sentence incorrectly they don't win anything!

They also don't win anything if, when they divide up the gold pieces equally, they find they have gold pieces left over. So they need to think very carefully whether they want to divide by two or by three.

3. The 12 card is turned back carefully so that it stays in the same place on the table.

Warn the players that they will find it helps them if they remember where that 12 is – and any of the other numbers displayed.

The aim of the game is to win as many pieces of pirate gold as they can, and players will find that some numbers are more useful than others.

If a child is finding the game hard, support them when they choose a suitable card to divide between, and also as they use cubes to work out how many gold pieces in each group.

For example:

? How many groups do you have to divide the twelve between?

? Have you got two equal groups? How do you know?

After a few turns you could ask the children to stop and reflect on what is happening.

? To win more gold, which are the best number cards to use? Those with larger or smaller numbers?

Establish that they will win more gold with twelve divided into two than six divided into two.

? When Dan said his sentence, do you think he said it correctly? What else could he have said?

? Ali, can you say the sentence that Dan just said?

? When Lisa said 'shared between two' was that right?

Variation

- It can turn into more of a game of chance if the number cards and the word cards are put into two shuffled piles and players take the top one of each pile and then return that card to the bottom of the pile. Doing this, some of the divisions won't work out without having a remainder, so the player will win nothing.

Learning outcomes

By the end of this set of activities, children should be able to:

- tackle related learning tasks with increased motivation and confidence;
- use and understand connected mathematical vocabulary;
- be systematic when sharing into equal groups using a 'one for you' approach;
- begin to have more efficient strategies for sharing, such as sharing out two or more at a time;
- begin to remember some division facts;
- use the language of division to describe the process;
- begin to show some understanding of estimating before dividing;
- check calculations by counting in increasingly efficient steps.