General training instructions

1. Each child first answers a question on the booklet, then they go on to discuss the answers and explain in a small group.

2. Then each group will write down their solution(s) on an acetate sheet. This acetate will be put up for the class to see, and will start a whole class discussion. Each group will take it in turns to start the discussion.

3. If the different groups (or children in groups) have different answers, see whether they can come up with explanations and convince each other. In many cases there will be more than one way of working out the answer, so see how many different ways the children can come up with. If only one answer appears when there are others which are right, then stimulate the children to find other solutions.

4. The emphasis is on the relation between the number of objects (chocolates, pizzas) being shared and the number of recipients, avoiding the use of the area-perceptual model when giving explanations.
Six girls are going to share a packet of biscuits. The packet is closed, we don’t know how many biscuits are in the packet.

1. If each girl received one biscuit and there were no biscuits left, how many biscuits were in the packet? __________________

2. If each girl received a half biscuit and there were no biscuits left, how many biscuits were in the packet? __________________

3. If some more girls join the group, what will happen when the biscuits are shared? Do the girls now receive more or less each than the six girls did? ______________

4. Your friend had a problem like the one in question two. You know that each of the children will get half a biscuit, but you don’t know how many children are in this problem. So how can you explain to a friend how to find the answer? What is the rule?

**Prompts:**
If each child gets half you multiply the number of biscuits by how many?(2) to get the number of children.
You divide the number of children by how many? (2) to get the number of biscuits.
Four people will be sharing 3 chocolates fairly.

1. Will each one be able to get one bar of chocolate? _______
2. Will each one be able to get at least a half bar of chocolate? _______
3. How would you share the chocolate? Mark the divisions on the chocolate bars. Write what fraction each one gets:________________

Prompts:
The children may write $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ and we then ask them to write the total: How many quarters? Or they may write: $\frac{1}{2}$ $\frac{1}{4}$ and we ask them to compare the two solutions – $\frac{3}{4}$ and $\frac{1}{2}$ plus $\frac{1}{4}$ - Was it shared fairly either way? Do the children have the same amount of chocolate if you have $\frac{3}{4}$ or $\frac{1}{2}$ plus $\frac{1}{4}$? Get the children to discuss this and say why.

After this problem has been solved, ask the children how they write a half and a quarter. Then ask them why they use a 2 for half and a 4 four quarters. If they don’t come up with any answer, we can question:

if you have a half, how many people were sharing the chocolate?
If you have a quarter, how many people were sharing the chocolate?

Then ask them to imagine you had a chocolate shared between three children. What fraction of the chocolate would they receive each? Ask them to write the answer, go over why it is a 3 in the bottom.

Ask if you have one chocolate shared among 5 children, what fraction would each one get? Ask why you use a five in the bottom of the fraction.

Finally, ask if you have one chocolate shared among 6 children, what fraction would each one get? Ask why you use a six in the bottom of the fraction.
1. Six children went to a pizzeria and ordered 2 pizzas to share between them. The waiter brought one first and said they could start on it because it would take time for the next one to come. How should they share it?

   How much will each one get from the first pizza that the waiter brings? Write your answer.

   How much will each one get when form the second pizza when it comes? Write your answer.

   If you add the two fractions, how many sixths will each one get? You can write a plus sign between the first fraction and the second fraction, put an equal sign after the second fraction and then put down the total that each child gets.

2. If the two pizzas came at the same time, could they share it differently? How much would each one get? __________

Prompt:

If the children don’t come up spontaneously with the idea of sharing one pizza among three children, we can suggest this possibility and ask whether the sharing would still be fair. Then ask which fraction of a pizza would each one get.

3. Does each child one get the same amount to eat either way? _______

   Why? ____________________________________________________________

   Extended discussion highlighting that 1/3 = 2/6 by thinking about the different ways that the pizzas can be shared.
1. Nine children have six chocolate bars to share. Find two different ways in which they could share. How much will each one get?

__________________   or ________________

Are both of these fair ways of sharing? Do the children get the same amount if they share the chocolates in one way or the other?________ Why?

Prompt:
If the child is uncertain, start with one chocolate bar.
If you chopped each bar into ½ would it work? (No) Why not?
If you chopped each bar into 3 parts would it work? (Yes) 2/3
If you chopped each bar into 9 parts would it work? (Yes) 6/9. If one bar is chopped into 9 pieces each child can have one bit (ninth). So how many of those bits (ninths) will each child get from six chocolate bars? 6/9
Others 4/6, 8/12, 12/18
What do these different ways tell us?
Six children have four chocolate bars to share. Find different ways of sharing them fairly.

What fraction of a chocolate bar will each child get?

**Prompt:**

Have the children compare the fractions and say whether they are the same amount of chocolate although you write the fractions differently.

If the child needs help ask, will it work if we do half bars? (No)

Each bar in 6 pieces (sixths) x 4 so its 4/6
Each bar in 3 pieces (thirds) x 2 so its 2/3

2/3, 4/6, 6/9, 8/12 are they the same amount of chocolate? Even though they are written differently?

Extension question (4)

Someone shared two chocolates between three children. Each child gets half a bar each, they share the remaining half of a bar between the three of them. What fraction of the whole do these three pieces represent. (1/6)
For this question the teacher needs to write up some of the fractions that have been used so far on the board.

e.g. 1/6 2/6 ½ 2/3 ¼ 2/4 etc (number of different fractions varying with the ability of the group)
The children need put the fractions on the ladder in order of size. With the smallest fraction at the top and the largest at the bottom.
Equivalent fractions should be placed on the same rung of the ladder.
After completing as much as they can on their own, children should discuss (in small groups) where each fraction should go. Class discussion should proceed as before.
Eight girls are going to share a box of chocolate bars. The packet is closed, we don’t know how many chocolate bars are in the packet.

1. If each girl receives $\frac{1}{4}$ of a chocolate bar and there is no chocolate left, how many chocolate bars are in the packet? ________________

2. If each girl receives $\frac{2}{8}$ of a chocolate bar and there is no chocolate left, how many chocolate bars are in the packet? ________________

3. Is one quarter more, less or the same as two eights? Explain your answer.

**Prompts:**

1. How many quarters in a whole bar? Is there enough in one bar to give each of the eight girls $\frac{1}{4}$ each? No? So you have to have another bar.

2. Give $\frac{1}{8}$ to each girl, how many eighths do I need? Do you have 16 eighths in one bar? No? So you need 2 bars. Why not three?
The teacher bought four huge chocolate bar and is haring them between the children as awards.

1. She shared the first one on Monday. Jo did an excellent job recycling the used paper and she said she could have \( \frac{1}{4} \) of the bar. Megan wrote a lovely story and the teacher said she could have half of the bar. Ali did a very good drawing and the teacher said he could have the rest of the bar. What fraction of the chocolate bar did Ali get?

2. On Tuesday the teacher broke the bar into 15 equal pieces. She gave 5 to Gyta for good work on fractions. What fraction of the chocolate bar did Gyta get? Then she gave the rest to Michael because he wrote a great story. What fraction of the chocolate bar did Michael get?

3. On Wednesday she shared the third bar. Anisha did a lovely dance for the class. The teacher said she could have \( \frac{3}{9} \) of the second chocolate bar. Usha did all her spellings right and the teacher said she also could have \( \frac{3}{9} \) of the bar. Ron helped sweep the leaves outside and the teacher said he could have \( \frac{3}{9} \) of the bar. Rebecca asked could she have a fraction of the bar because she did her fractions homework. How much of the second bar could Rebecca have?

4. On Wednesday Rob had done some good spellings and the teacher said he could have \( \frac{1}{3} \) of the third chocolate bar. Usha said it was not fair because when she did her spelling right the teacher only gave her \( \frac{3}{9} \). Do you think that Usha was right?

Prompts:

1. Do you know what a \( \frac{1}{2} \) and \( \frac{1}{4} \) is? How do you know? How many \( \frac{1}{4}s \) in a \( \frac{1}{2} \)? How do you know what is left? How many \( \frac{1}{4}s \) make a whole? So they used up how many? So many \( \frac{1}{4}s \) are left?

2. Do you know how many pieces as well? Its \( \frac{5}{15} \) how do we write this? How many pieces are left for Michael? What fraction would that be?

3. Was there any left for Rebecca? The teacher said that she didn't know if there was any left. \( \frac{3}{9} \) and \( \frac{3}{9} \) how many ninths are used up? Then another \( \frac{3}{9} \), so how many ninths are used up altogether?

4. Write fair or not fair. Share thirds then ninths, would it be the same. Show me your drawing, try with the chocolate bar shape in your book. \( \frac{3}{9}s \) in pieces is the same as \( \frac{1}{3} \) so it is fair.
1. Yesterday Gail had four bars of chocolate. She ate half a bar, gave half a bar to her brother and half a bar to her sister. How many chocolate bars did the three of them eat altogether?

2. How much does she have left for today?

Prompts:
1. Use the bars to help you think. How much did they each get? How much did her brother and sister get altogether? (1) 3 lots of ½ is the same as what? 1 bar plus 1/2.

2. How much is left? How much has been eaten? 1 ½. What is left, how do you know that?
1. Imagine the stars in the box are being shared between three people. How many stars do they each get?
2. What fraction of the stars did each girl get?
3. What fraction of the stars are left over after Jane has been given one third?

Prompts:
How many parts if we need thirds?
So how many stars are in each part?
Each part is a third remember.
So how many are left after a third have gone?
Mary had a bag with 16 sweets in. She shared them equally between her 8 animal friends.

What fraction of the sweets did each animal get?

Mary had a bag with 16 sweets in. She shared them equally between her 8 animal friends.

What fraction of the sweets did each animal get?
Is there more than one way of writing this?
1. Janice was given two out of eight of the pencils. What fraction of the pencils did she get?

2. Can you think of another way of writing this?
1. Five children did some very good work and the teacher said that they could share this box of cakes, how many cakes did they get each?

2. What fraction of the cakes in the box did they each get? What is one fifth of ten?

3. If Amy and Liz give their cakes to Razwan, what fraction of the cakes in the box does he have altogether?
   (How many fifths does he have now?)

4. Extension question: Someone’s friend is trying to calculate one fifth of a number. How can you explain to her?
   Is there a rule for working out one fifth of a number?
Twelve children go to a pizzaria. They order six pizzas. There are no tables in the pizzaria big enough for all twelve children to sit at. Can you think of ways that the children can arrange the seating using smaller tables? Can you decide how the pizzas should be shared out fairly?

What would happen if there were two tables? How many children could sit around each one, and how many pizzas would they share?

Then show feedback.

Now ask the children to think of different ways for seating the children and distributing the pizzas.

On the OHP/feedback show them that they can can write their answers by drawing circles (representing the tables) and writing on the circles the number of pizzas and around the circles the number of children.

Try to find as many different ways as possible.

Each group should try to show as many ways of sharing as possible on their acetate sheet.

**Prompts:**

What would happen if you put one pizza on each table?

What would happen if you put two pizzas on each table?

If you have six pizzas shared between twelve children, what fraction of a pizza does each child get? How many children share each pizza?
1. A class of Year 4 children went to the pizzeria and ordered 12 pizzas to share between all the children. Each child is going to get one third of a pizza. How many children are in this class?

2. The pizzeria does not have tables big enough for all the children to sit together. The children will have to sit in groups of six around the tables. How many tables will they need?

3. The waiter asked how many pizzas he should put on each table so the children can share the pizzas on their table. How many pizzas should go on each table?

4. The teacher calculated that she only had enough money for drinks and ice cream if the children shared one carton of juice between two of them. What fraction of the carton is each child going to drink? How many cartons of juice does the teacher have to buy?

Prompts:

1. How many children eat one pizza? Two pizzas, three pizzas etc.

2. How do you know? After sharing answers, one of the children can click one of the action buttons on the screen to get the feedback.

3. If you put one pizza on each table, how many pizzas do you use up? But you have 12 pizzas, so its 2 on each table.

4. If children find the sum difficult to do, they could work out what is have of 30 (15) and what is half of 6 (3) – 15 plus 3 gives 18.
1. What is another way they can organise the seating? How many children could sit around each table?

2. How many pizzas should the waiter put on each table?

3. The teacher spent half of the money on the pizzas and a quarter on the drinks. What fraction of the money has she spent already? What fraction does she have left to spend on ice cream?
1. Ali and Paula tied in first place in the roller blade racing in their school. They have to share the prize, which is some money. What fraction of the money will each one have?

2. Roger and Tina entered a dance competition in the community centre and they were tied in first place. They are sharing the prize, which is also some money. What fraction of the money will each one have?

3. Is it possible that Ali and Roger receive different amounts of money? Explain why you think so.
Feedback slide for the first part of the first question. Click on the bullseye in the corner to return to the original slide.
Feedback slide for the second part of the first question. Click on the bullseye in the corner to return to the original slide.
If each child gets $\frac{1}{2}$ a biscuit can you work out a way to find the number of children?

Feedback slide for the fourth part of the first question. Click to go to the next slide where children can type in their own responses if there is time.

4. Your friend had a problem like the one in question two. You know that each of the children will get half a biscuit, but you don’t know how many children are in this problem. So how can you explain to a friend how to find the answer? What is the rule?

If each child gets $\frac{1}{2}$ a biscuit can you work out a way to find the number of children?
Feedback for the fourth part of the first question. Click on the bullseye to return to the first question.
If each child gets $\frac{1}{2}$ a biscuit can you work out a way to find the number of children?
If any group comes up with a good way of explaining get one of them to type their answer into the power point slide so that the whole class can see.
Ask them if they can think of any other ways of explaining.
Encourage them to try to use different words such as multiply, divide and half when giving their explanations. ‘Is there a different way of saying…….’
Try to get children to see the correspondence between one biscuit to two children.
Feedback slide for the first part of the second question. Click on the bullseye in the corner to return to the original slide.
Feedback slide for the second part of the second question. Click on the bullseye in the corner to return to the original slide.
Feedback slide for the first part of the third question. Click on the bullseye in the corner to return to the original slide.

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\frac{1}{6} + \frac{1}{6} = \frac{2}{6}
\]
Feedback slide for the extension part of the fourth question. Click on the bullseye in the corner to return to the original slide.

Six children have four chocolate bars to share. Find different ways of sharing them fairly.

What fraction of a chocolate bar will each child get?

Have the children compare the fractions and say whether they are the same amount of chocolate although you write the fractions differently.
Cake question feedback

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2. What fraction of the stars did each girl get?
What fraction of stars are left over after Jane has been given one third?

Jane

Cake question feedback
2. What fraction of the stars are left over after Jane has been given one third?
Animal question feedback

1/8 or 2/16
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This shows 2 tables with 6 children sitting around each. There are 3 pizzas on each table.
1. A class of Year 4 children went to the pizzeria and ordered 12 pizzas to share between all the children. Each child is going to get one third of a pizza. How many children are in this class?

2. The pizzeria does not have tables big enough for all the children to sit together. The children will have to sit in groups of six around the tables. How many tables will they need?

3. The waiter asked how many pizzas he should put on each table so the children can share the pizzas on their table. How many pizzas should go on each table?

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When the children went to sit down, they found that there were not enough tables of six left.

1. What is another way they can organise the seating? How many children could sit around each table?

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CONGRATULATIONS YOU HAVE REACHED THE END!