

Fractions: Lesson 5

Adding and subtracting fractions

Maths KS2 Years 3 and 4

Fraction

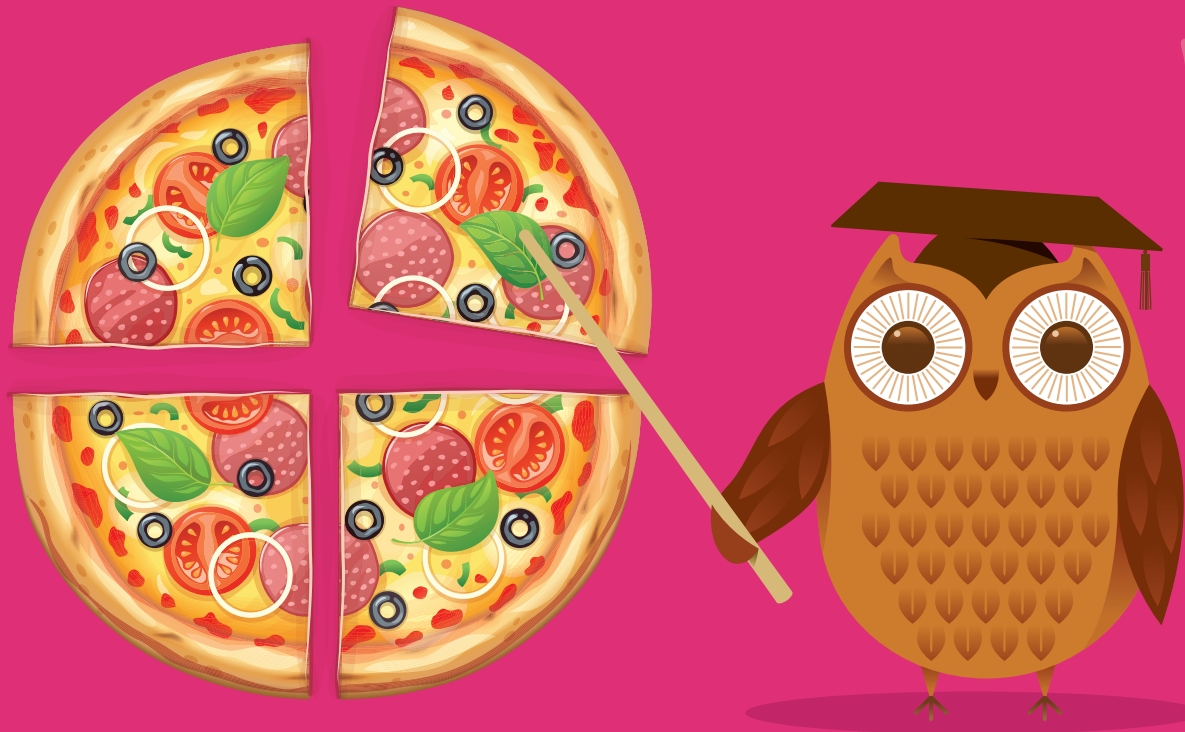
Equal
Parts

Dividing
Bar

Numerator

One
sixth

One
eighth



Maths Lesson 5: Fractions

Adding and subtracting fractions.

Maths

**Key Stage 2
Years 3 and 4**

Learning Objectives:

To deepen understanding that:

- When adding fractions with the same denominators just add the numerators.
- When subtracting fractions with the same denominators just subtract the numerators.

Curriculum Link

To solve problems that involve fractions.

Keywords for Lesson 5

Fraction. Equal parts. Dividing bar. Denominator. Numerator. One half. One third. One quarter. One sixth. One eighth.

These can also be found at the end of this PDF, in printable format for the learning wall.

Fraction

**Dividing
bar**

**One
sixth**

Numerator



You will need the following resources for this lesson:

- Pupil white boards and pens, scissors, paperclip, ten biscuits, a biscuit jar and 2 plates
- Handout 1 – Large paper pizza cut into eighths
- Handout 2 – Mini pizza, one per pair, each one cut into eighths
- Handout 3 – Spinner 12 per pair (same as for lesson 4)
- Handout 4 - Addition loop cards to be cut up. One set of 12 cards per pair/group of 4
- Handout 5 – Blank loop cards
- Handout 6 – Key words for lesson

PowerPoint presentation

The accompanying PowerPoint has the following learning points:

- Slides 1 and 2 introduce the lesson and the learning aims. The session considers how, when adding fractions with the same denominators just add the numerators.
- Slide 3 uses a story context so that children understand the concept using an example. You will need to narrate the scene first: If Jay ate $\frac{3}{8}$ of a pizza and Sarah ate $\frac{2}{8}$, how much of the pizza has been eaten?

Do not write as a number sentence at this point so the children do not acquire the misconception of adding the top (the numerator) and then adding the bottom (the denominator).

You could use Handout 1, cut up into eighths, to role play this starting point and questions such as:

- How many equal slices has this pizza been divided into?
- If Jay eats three of the slices what fraction of the pizza has he eaten?
- If Sarah ate two slices of the pizza what fraction of the pizza has she eaten?
- How many eighths of the pizza have they eaten all together?
- How many more slices has Jay eaten than Sarah?
- Ask the children, in pairs, to discuss how much of the pizza has been eaten. Can they draw a picture to show how much pizza has been eaten and how much is left?

(There is a prompt note on the actual slide.)



- Slide 4 shows each child saying how many slices of pizza they both have. The children can say the stem sentences on this slide together. Place the children in pairs and ask them to discuss how much of the pizza has been eaten. Can they draw a picture to show how much pizza has been eaten and how much is left?
- Slide 5 shows some examples of representations and the stem sentences, '**altogether we have five one eighths. Altogether we have five eighths,**' are at the bottom of the slide.

Activity 1

- Slide 6 introduces the independent follow-up task where children work in pairs, using a small cut up pizza (Handout 2), a spinner (Handout 3, the same spinner used in Lesson 4). The rules of this activity are for each child to spin the spinner and collect the correct number of pizza slices. Using the stem sentences, children work out how many eighths of the pizza they each have, and how many they have together. Ask the children to record their pizza calculations.

Timing: approximately 10 minutes.

- Slide 7: ask the children these questions:
 - What does the number $\frac{3}{8}$ represent? The number of slices of pizza Jay ate.
 - What does the number $\frac{2}{8}$ represent? The number of slices of pizza Sarah ate.
 - What does the number $\frac{5}{8}$ represent? The number of slices they have eaten altogether.

Teaching point. The children haven't been asked to add two fractions together, they have been asked to consider, through a familiar context, what would happen if you had three eighths and two eighths.

Now read out the stem sentence together.

Three eighths plus two-eighths is equal to five eighths.

(There is a prompt note on the actual slide.)

- Slide 8 displays the fraction number sentence, $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$.
Ask the children to look at the fraction number sentence and ask them what is the same and what is different?
Expect the response: the denominator has stayed the same and the numerator has changed.



- Slide 9 explores the general misconception children make when adding or subtracting fractions. In pairs ask the children to discuss which sentences and images are correct and why. Then animate (or click on) the slide to remind children of the role of the numerator and the denominator. You can demonstrate that the answer in the top fraction number sentence is incorrect. Reiterate that the pizza had been cut into eight equal pieces, into eighths. The number of equal parts does not change, it hasn't been cut up into any more slices. In the pizza context the pizza is still cut into eight equal slices of eight one-eighths, so the denominator is still 8. The numerator is the number of parts. This has changed because Jay had eaten three slices and then Sarah ate two more slices. So the total number of slices, or parts of the whole, has changed. (There is a prompt note on the actual slide.)

Activity 2

- Slide 10 uses Handouts 4 and 5 (addition loop cards). The slide is animated to demonstrate how to play the game. Model how to play the game. As it is a loop game it doesn't matter which card you start with. Read out the first card and ask the children the question at the bottom of the first card, which is $\frac{3}{5} + \frac{1}{5}$. Then in pairs ask them to work out what fraction they are looking for at the top of the next card, then click on the slide to reveal where the answer is on the next card, as well as where the next question is. Repeat for the next card. When the third card has been shown, show the children that the answer to this card is at the top of the first card. (These notes are also left as a prompt on the actual slide.) There are 12 cards for each pair or group of three or four. Ask the children to deal out the cards and then one person starts the game by choosing a card to put down, like dominoes. They can add to either end of the line of cards. The winner is the first person to get rid of all their cards. The whole team can win if they complete the loop and the final question matches the answer at the top of the first card. Allow 10 minutes for the game. Allow the children to play this a couple of times, then give out handout 5 and ask the children to make up their own loop game in pairs to share with another pair. (There is a prompt note on the actual slide.)

Timing: Allow 10 minutes for this.



Activity 3

- Slides 11 and 12 introduce a new scenario, setting the following scene:
 - Jay put three tenths onto his plate
 - Sarah put five tenths onto her plate.
 - What fraction of the biscuits have the children taken together?
 - $\frac{3}{10}$ plus $\frac{5}{10} = \frac{8}{10}$
- Slides 13 and 14 show that subtraction of fractions works in the same way as addition. When subtracting fractions with the same denominator just subtract the numerators. You can role play this first to help reinforce the learning.
 - Sarah has $\frac{5}{10}$ of the biscuits on her plate. If she ate two of her biscuits what fraction of the biscuits would be left?
 - $\frac{5}{10} - \frac{2}{10} = \frac{3}{10}$
 - Read out the stem sentences on slide 14.
 - Five one-tenths minus two one-tenths is equal to three one-tenths.
 - Five tenths minus two tenths is equal to three tenths.
- Slide 15 is the plenary. The plenary considers the key idea that when subtracting fractions with the same denominators, just subtract the numerators.
- Slide 16 is the final activity which is a challenge opportunity. This is an open-ended activity, which could also be used as an assessment task to see how many different calculations the children can make with an answer of $\frac{3}{8}$. Children to work in pairs and record their ideas.

Timings: approximately 15 minutes.

- Slide 17 is a review slide for you to annotate on your interactive whiteboard or to collect what children reflect they have been learning about.

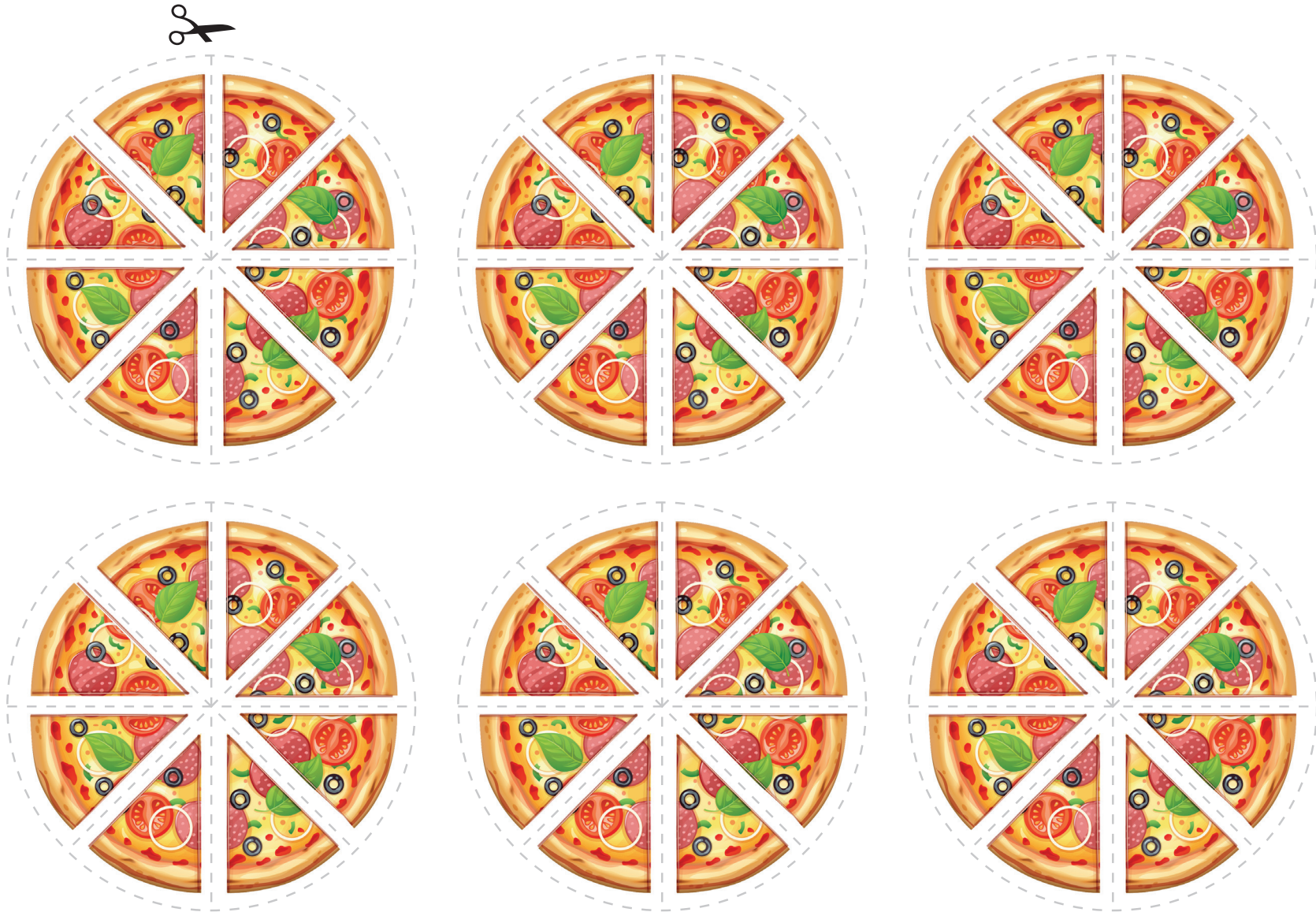
The coloured underlined ideas are the key ideas from this lesson. They indicate opportunities for pupil talk indicated throughout the PowerPoint.



Handout 1



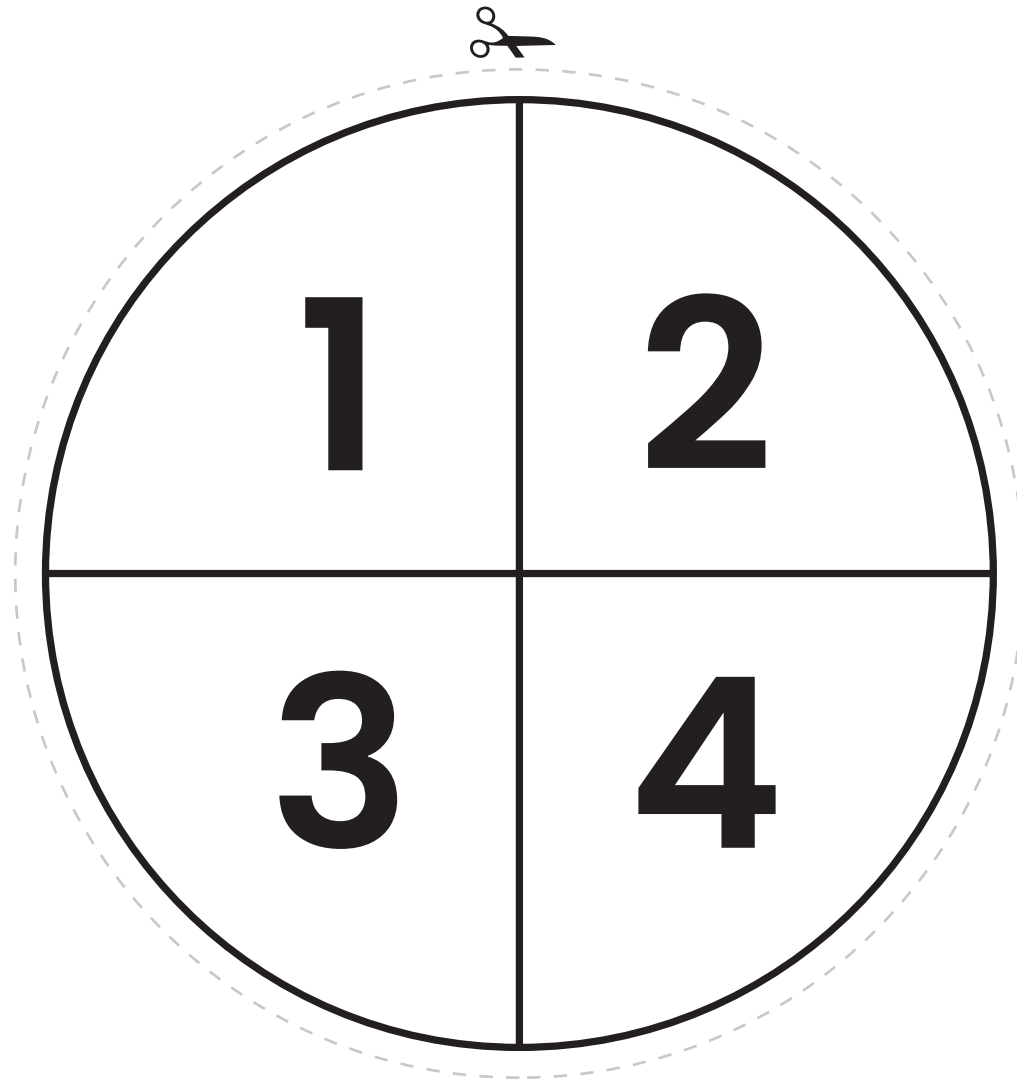
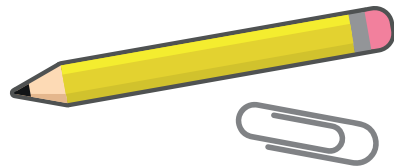
Handout 2



Handout 3

Spinner for Activity 1.
This can be cut out and used with a
paper clip and a pencil.

You will need:



Handout 4

Addition Loop Game



I have $\frac{3}{8}$ Who has $\frac{1}{4} + \frac{2}{4}$	I have $\frac{3}{4}$ Who has $\frac{1}{4} + \frac{1}{4}$	I have $\frac{2}{4}$ Who has $\frac{1}{8} + \frac{5}{8}$	I have $\frac{7}{8}$ Who has $\frac{3}{8} + \frac{2}{8}$	I have $\frac{5}{8}$ Who has $\frac{3}{6} + \frac{2}{6}$	I have $\frac{6}{8}$ Who has $\frac{1}{8} + \frac{3}{8}$
I have $\frac{4}{8}$ Who has $\frac{1}{6} + \frac{2}{6}$	I have $\frac{3}{6}$ Who has $\frac{3}{8} + \frac{4}{8}$	I have $\frac{5}{6}$ Who has $\frac{1}{3} + \frac{1}{3}$	I have $\frac{2}{3}$ Who has $\frac{2}{5} + \frac{2}{5}$	I have $\frac{4}{5}$ Who has $\frac{2}{5} + \frac{1}{5}$	I have $\frac{3}{5}$ Who has $\frac{1}{8} + \frac{2}{8}$



Handout 5

Blank Addition Loop Game



I have Who has	I have Who has	I have Who has	I have Who has	I have Who has	I have Who has
I have Who has	I have Who has	I have Who has	I have Who has	I have Who has	I have Who has



Fractions: Keywords Flashcards



Fraction

**Equal
parts**

**Dividing
bar**

Denominator

Numerator

**One
half**



Fractions: Keywords Flashcards



**One
third**

**One
quarter**

**One
sixth**

**One
eighth**



Fraction



Equal parts



Dividing bar



Denominator



Numerator



One half



One quarter



One third



One sixth



One eighth

