

Topic 2: Numbers

Numbers

1 2 3 4 5 6 7 8 9 10

Topic	By the end of the lesson the students will be able to:	Vocabulary	Structures	Learning strategies
1. Whole numbers	<ul style="list-style-type: none"> read whole numbers up to 1000 in numerals and in words write whole numbers up to 1000 in numerals and in words 	numeral; whole numbers in words and numerals up to 1000	What number is this?; What number's that?; It's...	<ul style="list-style-type: none"> Pair work – asking and answering questions
2. Types of numbers	<ul style="list-style-type: none"> identify even and odd numbers up to 1000 sort groups of numbers into ascending and descending order. 	even; odd; numeral; in ascending/ descending order; connect; go together; stand up; sit down; turn around	Is this an odd/even number?; It's odd/even; Which of these is?;	<ul style="list-style-type: none"> Ordering
3. Addition and subtraction	<ul style="list-style-type: none"> find the sum of two whole numbers find the difference between two whole numbers. 	Subtraction/subtract; take away; minus; the difference between; addition/add; total of; sum of, plus; equals; is equal to; numbers ending in 'teen' and 'ty'	X plus/add Y equals...; X minus/take away Y equals...; What is the total/sum of ...?;What does X plus Y equal?; What's the difference between ... and...?; What does X minus/take away/ subtract Y equal?	<ul style="list-style-type: none"> Mental arithmetic
4. Multiplication and division	<ul style="list-style-type: none"> find the product of two numbers find the quotient of two numbers. 	times; multiplied by; product; quotient; divide, goes into; equals	What is the product/quotient of X and Y?; The product/quotient of X and Y is ...; three fours are...; What is X times/divided by Y?; X multiplied by/ divided by Y equals/is ...	<ul style="list-style-type: none"> Mental arithmetic repetition
5. Fractions	<ul style="list-style-type: none"> recognise and say fractions write fractions in words and in numerals. 	a third; two thirds; a quarter; three quarters; a half; a sixth; two sixths; all fractions in numbers and words	What fraction is shaded/unshaded?; What fraction is this?	<ul style="list-style-type: none"> Visual representations

6. Decimals	<ul style="list-style-type: none"> • read decimals • state decimal place • round up and round down to a given number of decimal places. 	decimal point; decimal place; digit; zero, point; ones/units; tenths; hundredths; thousandths; and (as a substitute for the decimal point)	What's the place value of...; Round off to X decimal places	<ul style="list-style-type: none"> • Organising and sorting place value • Kinaesthetic students will appreciate the opportunity to move and learn
7. Percentages	<ul style="list-style-type: none"> • identify percentages • read percentages • write percentages in words and numerals. 	percentage/percent; per; express;	What is X percent of Y? Find the percentage of...;	<ul style="list-style-type: none"> • Revision of small chunks through a quiz • Using a dictionary or other students to understand meanings of words
8. Converting fractions, decimals and percentages	<ul style="list-style-type: none"> • convert between fractions, decimals and percentages. 	percentage/percent; per, express; decimal; fraction	What is X percent of Y?; Find the percentage of...; Express X as a Y; X as a Y is...	<ul style="list-style-type: none"> • Using games to learn
9. Integers	<ul style="list-style-type: none"> • identify positive and negative numbers • relate the use of positive and negative numbers to real life situations. 	positive integers; negative integers; above/below zero; freezing; boiling; minus; degrees centigrade; temperature; thermometer; higher; lower; profit; loss; more than; less than.	Is this a negative/positive number?; It's a positive/negative number; Is the temperature above/below freezing/boiling?; Which temperature is colder/hotter?	<ul style="list-style-type: none"> • Lines as graphic organisers • Using the top right hand corner of the board as a place for vocabulary notes and translations
10. Number patterns	<ul style="list-style-type: none"> • identify patterns of numbers • identify numbers within a pattern • create number patterns. 	odd; even; multiple of; ascending; descending; divisible by; fraction; percentage; decimal; rule; term	What's the rule?; What's the next term?; What is ('s) the next number in the sequence?	<ul style="list-style-type: none"> • Ordering patterns of numbers

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Lesson 1: Whole numbers

Vocabulary: Numeral; whole numbers in words and numerals up to 1000

Structures: What number is this?; What number's that?; It's...

Lesson content objectives:

By the end of the lesson the students will be able to:

- read whole numbers from 0 up to 1000 in numerals and in words
- write whole numbers from 0 up to 1000 in numerals and in words

Learning strategy: Pairwork – asking and answering questions.

Introduction (5 mins)

- Say: 'Good morning/afternoon. How are you?' Wait for the students to reply.
- Write '5, 7, 10, 12, 15, 19, 40, 60, 136, 279, 366, 801, 999, 1000' on the board.
- Point to each number in order and say, 'What number's this?' and get the class to say the number.
- As they say the numbers check the pronunciation.

Note: Point out the following:

Nineteen – 'teen'; forty – 'ty'; twenty-six – the hyphen; one hundred and thirty-six – the 'and', all lower case and no commas; check that they are not putting an 's' on the end of the word one hundred; one thousand – this is often said as 'a' thousand.

Presentation (10 mins)

- Say: 'Open your book at Topic 2, Lesson 1 and look at Activity 1'. Hold up your Student book at the correct page and point to the activity. Ask: 'Can you read the numbers in this activity?' Wait for the students to reply.
- Ask for a volunteer to help you demonstrate.
- Point to any number in the activity and ask: 'What number's this?' The student answers.
- Now the student points and asks you the question. You answer.
- Ask for another volunteer and the two students demonstrate to the class.
- In pairs, the students do the activity.
- Monitor and help.

Practice (10 mins)   

- Write the numbers, 3, 6, 8, 11, 12, 16, 19, 23, 46, 55, 60, 79, 88, 90, 133, 348, 517, 645, 890, 1000 all over the board.
- Put the class into two or three teams with each team in a line stretching away from the board.
- Shout out the numbers and the front person in each team runs to the board and tries to be the first to touch the number.
- Keep score and praise the winners.



Consolidation/evaluation and assessment (5 mins)   

- Say: 'Look at Activity 2'. Hold up your Student Book and point to the activity.
- Write the word 'two' on the board and ask: 'Is this a numeral?' (Answer – no)
- Write the number '3' on the board and ask: 'Is this a numeral?' (Answer – yes)
- Ask: 'What is a numeral?' (Answer – A symbol of a number.)
- Students repeat 'numeral'.
- Say: 'Take out your exercise books. Copy and complete the table'.
- Monitor and help.

Reflection 

- Ask the students how much of the topic they remember from primary school.
- Ask them whether they think they would benefit from reviewing all the numbers up to 1000 at home.

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Answers

Activity 1

940 – nine hundred and forty	453 – four hundred and fifty-three	19 - nineteen	814 - eight hundred and fourteen	646 – six hundred and forty-six
680 – six hundred and eighty	334 – three hundred and thirty-four	9 - nine	123 – one hundred and twenty-three	124 – one hundred and twenty-four
567 – five hundred and sixty-seven	212 – two hundred and twelve	718 – seven hundred and eighteen	57 – fifty seven	199 – one hundred and ninety-nine
0 - zero	1000 – one thousand	870 – eight hundred and seventy	473 – four hundred and seventy-three	568 – five hundred and sixty-eight

Activity 2

One hundred and thirteen	113	523	Five hundred and twenty-three
Seven hundred and forty-two	742	140	One hundred and forty
Eight hundred and fifty-nine	859	257	Two hundred and fifty-seven
Six hundred and thirty-six	636	617	Six hundred and seventeen
Three hundred and seventy	370	499	Four hundred and ninety-nine

Extension activity

- Each student writes three numbers on a piece of paper.
- In groups of six, the students swap pieces of paper and read out the new numbers to the rest of their group.
- The group checks that they are correct.
- Monitor and help.

Teacher's reflections

- Did the students know their numbers both spoken and written?
- Do you need to revise the numbers again in another class?

Lesson 2: Types of numbers

Vocabulary: Even; odd; numeral; in ascending/descending order; connect; go together; stand up; sit down; turn around

Structures: Is this an odd/even number?; It's odd/even; Which of these is ...?

Lesson content objectives:

By the end of the lesson the students will be able to:

- identify even and odd numbers up to 1000
- sort groups of numbers into ascending and descending order.

Learning strategy: Ordering.

Preparation: Make number cards in numerals from zero to the number of students you have in the class.

Note: The 'Introduction' and 'Presentation' stages are best done in a large room or outside in the yard.



Introduction (5 mins)

- Say: 'Good morning/afternoon. How are you?' Wait for the students to reply.
- Give each student a number card.
- Ask the students what number is on their card. Ask some of the students to read out their number.
- Everybody should check that they are correct.
- Ask the students to get into ascending order and then descending order. Use hand gestures to show going up and going down. You can ask who has the biggest number and who has the smallest number and put them at the top and bottom of the line. Then show that the other students should line up between. If there are too many students you can split the groups up so that they are working in groups of ten or twenty.
- When they have got into groups ask each group to repeat: 'We are in ascending/descending order.' They can say their number one after another along the line if you have time.



Presentation (10 mins)

- Ask the students to get into groups of numbers that they think 'go together' or connect.

Note: This activity could produce many different answers. Students may get into groups of

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numbers that contain one digit or two digits they may get into ascending or descending order or they may get into smaller groups of sequential numbers. All answers are acceptable if they have an explanation.

- Go with whatever groups they form and discuss what connections the numbers have with each other.
- Ask numbers 2, 8, 12, 26, 30 and 34 to come to the front.
- Ask the class how they connect. (Answer – They are all even numbers.)
- Write these even numbers on the board and students repeat after you, ‘*even numbers*’.
- Ask numbers 7, 11, 15, 23, 33 to come to the front.
- Ask the class what they all are. (Answer – They are all odd numbers.)
- Write these odd numbers on the board and students repeat after you, ‘*odd numbers*’.
- Ask all the students to come to the front and line up in:
 - ascending order
 - descending order
 - descending odd number order
 - ascending even number order. (Show ascending/descending with arm gestures.)
- Ask them to read out their numbers in the order after they finish each line-up.

Practice (10 mins)



- Say: ‘*Open your Student book at Topic 2, Lesson 2 and look at Activity 1.*’ Hold up your Student book at the correct page and point to the activity. Ask: ‘*Which topic, lesson and activity do you need?*’ Wait for the students to reply.
- In pairs, the students ask each other whether the numbers are odd or even.
- Monitor and check that the students are using the correct English.

Consolidation/evaluation and assessment (5 mins)



- Play a short game of ‘Stand up, sit down, turn around’.
- Say: ‘*Even numbers stand up. Odd numbers turn around.*’
- All the students swap numbers and you repeat the game using different actions.

Reflection



- Ask the students whether they think odd and even numbers are important in maths. Why?
- Ask them whether they need to practise their numbers in English more. Tell them to say all the numbers they see around them in their lives in English to help practise them more.

Answers 

Activity 1

Even numbers are 206 – two hundred and six; 142 – one hundred and forty-two; 70 – seventy; 44 – forty-four; 22 – twenty-two; 14 – fourteen.

Odd numbers are 17 – seventeen; 19 – nineteen; 27 – twenty-seven; 41 – forty-one; 67 – sixty-seven; 99 – ninety-nine; 111 – one hundred and eleven; 121 – one hundred and twenty-one; 153 – one hundred and fifty-three.

Activity 2

even numbers	122, 1000, 66, 76, 144
odd numbers	51, 73, 97, 53, 999, 61, 1

Extension activity   

- Tell the students to look at Activity 2 and complete it in the exercise books. Feedback with the answers.
- Put the students into groups of four, the students take turns to say all the even numbers starting from two and moving up in ascending order in turn, one number each turn.
- They repeat this with the odd numbers.

Teacher's reflections 

- Were the students able to complete the ordering activities?
- Do you need to give them translations of the words?

Homework  

- Ask the students to count everything between now and the next lesson in English. Ask them to count trees while walking home, steps to their house, anything that they could possibly count. Tell them that there will be a prize for the most unusual thing counted.

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Lesson 3: Addition and subtraction

Vocabulary: Subtraction/subtract; take away; minus; the difference between; addition/ add; total of; sum of; plus; equals; is equal to; numbers ending in 'teen' and 'ty'

Structures: X plus/add Y equals...; X minus/take away Y equals...; What is the total/sum of ...?; What does X plus Y equal?; What's the difference between...
What does X minus/take away/subtract Y equal?

Lesson content objectives:

By the end of the lesson, the students will be able to:

- find the sum of two whole numbers
- find the difference between two whole numbers.

Learning strategy: Mental arithmetic.

Preparation: Collect 20 objects such as pebbles, small boxes or pencils.



Introduction (5 mins)

- Say: 'Good morning/afternoon. How are you?' Wait for the students to reply.
- Write 27, 15, 48, 69, 71, and 95 on the board.
- Point to the numbers in any order and encourage the class to chorus the number.
- Ask for six volunteers to come to the board. They write the numbers in words one after another. (Answers – twenty-seven, fifteen, forty-eight, sixty-nine, seventy-one, ninety-five.)
- Ask the class: 'Is that right?' Get the class to tell you any spelling mistakes on the board.

Note: Make sure that the students are using a hyphen in their numbers. For example, twenty-seven. Check the spelling of four and forty. Forty drops the 'u'. Make sure that the students are clear on the difference between 'teen' and 'ty'.



Presentation (10 mins)

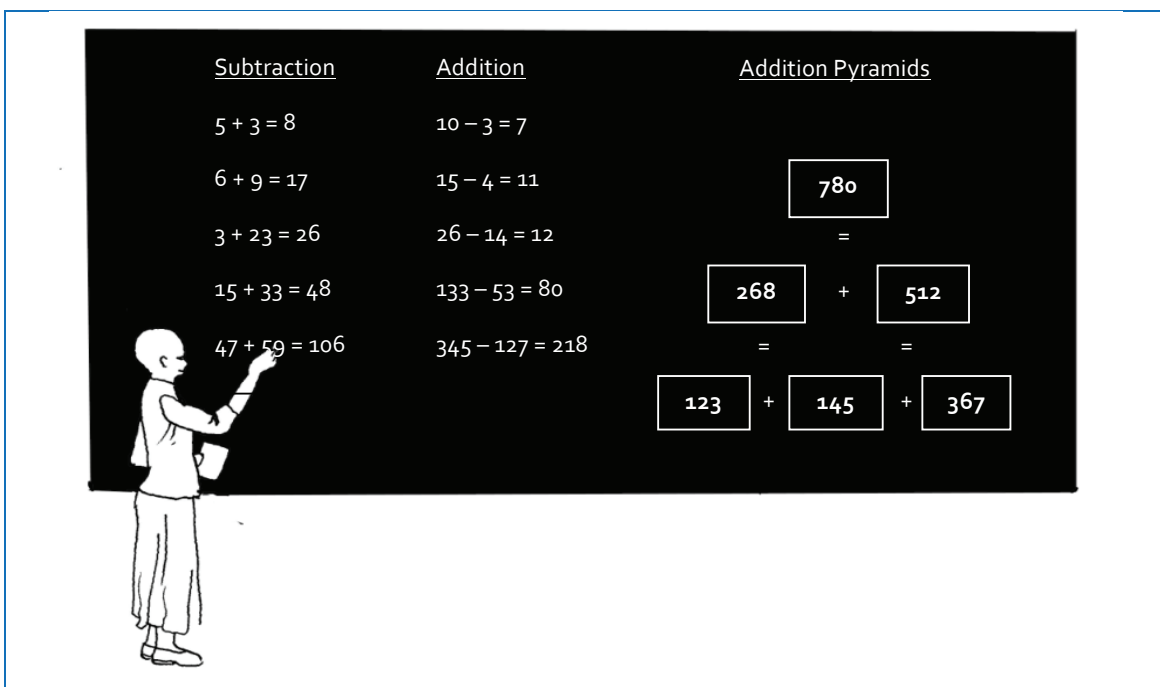
Stage 1

- Count out five pebbles. Say: 'plus' and count out three pebbles. Say 'equals' and wait for a response.
- Say: 'Five plus three equals eight. This is addition!'

- Write this number sentence on the board: ' $5 + 3 = 8$ '.
- Point to the plus sign and the equals sign. Say: '*This is plus and this is equals.*'
- Write four or five more simple additions on the board and the class should chorus the number sentences.

Stage 2

- Count out ten pebbles. Say: '*minus*' and take out three pebbles. Say: '*equals*' and wait for the students to respond.
- Say: '*Ten minus three equals seven. This is subtraction!*'
- Write this number sentence on the board: ' $10 - 3 = 7$ '.
- Point to minus and equals sign. Say: '*This is minus and this is equals.*'
- Write four or five more simple subtractions on the board and chorus the number sentences.
- Write a mixture of addition and subtraction number sentences on the board. The class chorus the number sentences.



Practice (5 mins)    

- Say: '*Open your Student book at Topic 2, Lesson 3 and look at Activity 1.*' Hold up your Student book at the correct page and point to the activity.

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- Say: 'Complete the addition pyramids.' Show an example pyramid on the board with different numbers and discuss with the class how they are completed. Do not do the examples in the book.
- In pairs, the students do Activity 1 both orally and in writing.
- Monitor and help.

Consolidation/evaluation and assessment (10 mins)



- Say: 'Look at Activity 2.' Hold up your Student book and point to the activity.
- Tell the students to complete the number puzzle in pairs in English.
- Monitor and help. Make sure that the students are speaking English.

Reflection

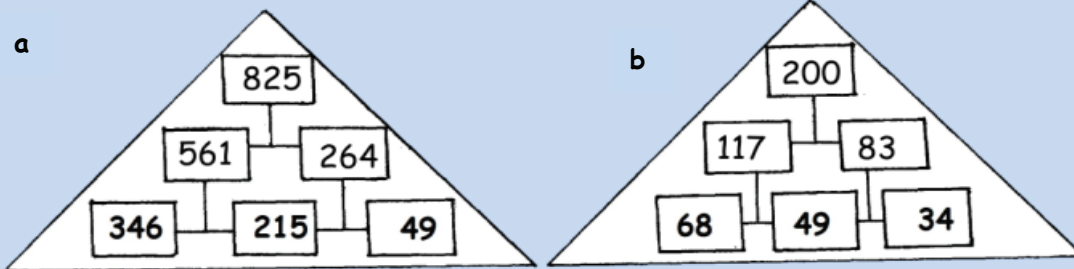


- Ask the students: 'Are these number sentences easy to understand or can you make them simpler. Is there any way of making them easier to remember?'

Answers



Activity 1



Activity 2

a

6	+	8	=	14
+		+		+
7	+	9	=	16
=		=		=
13	+	17	=	30

b

20	-	12	=	8
+		+		+
25	-	12	=	13
=		=		=
45	-	24	=	21

Extension activity 

- Say: *'Write three subtractions on a piece of paper and give them to your partner.'*
- Each student then does their partner's subtractions.
- Say: *'Check your answers with your partner by saying the number sentences out loud.'*

Teacher's reflections 

- Did the students find any of the language particularly difficult? Are there any ways that you can help them remember the language? Is there any visual they can call up in their mind to make the language easier to remember?

Topic 2: Numbers

Lesson 4: Multiplication and division

Vocabulary: times; multiplied by; product, quotient; divide; goes into; equals

Structures: What is the product/quotient of X and Y?; The product/quotient of X and Y is ...; three fours are... ; What is X times/divided by Y?; X multiplied by/divided by Y equals/is...

Lesson content objectives:

By the end of the lesson the students will be able to:

- find the product of two numbers
- find the quotient of two numbers.

Learning strategies: Mental arithmetic; repetition.

Preparation: Collect 20 pebbles or counters and bring them in to the class.

Introduction (5 mins)

- Write the sign for *multiply* (\times) on the board. Ask: 'What does this mean?' Write 'multiply' next to the sign.
- Write the sign for *divide* (\div) on the board. Ask: 'What does this mean?' Write 'divide' next to the sign.
- Write the following number sentences on the board. '5 \times 6=' and '45 \div 9='. Do not write the answers.
- Point out the vocabulary *multiplied by*, *times* and *divided by*. Ask the students to chorus the number sentences.
- Ask for a volunteer to come to the front and write two more similar number sentences. The class chorus these using the vocabulary on the board.

Note: It is a good idea to keep the top right hand side of the board as a place for vocabulary and translations. This way the students know where to look when they need help with a word. If anyone in the class asks for a spelling or translation then you can write it here so that it is there for the rest of the class. Make sure that you let the class know what kind of word each is: (n) = noun; (v) = verb; (adv) = adverb; (adj) = adjective, etc.

Presentation (10 mins)

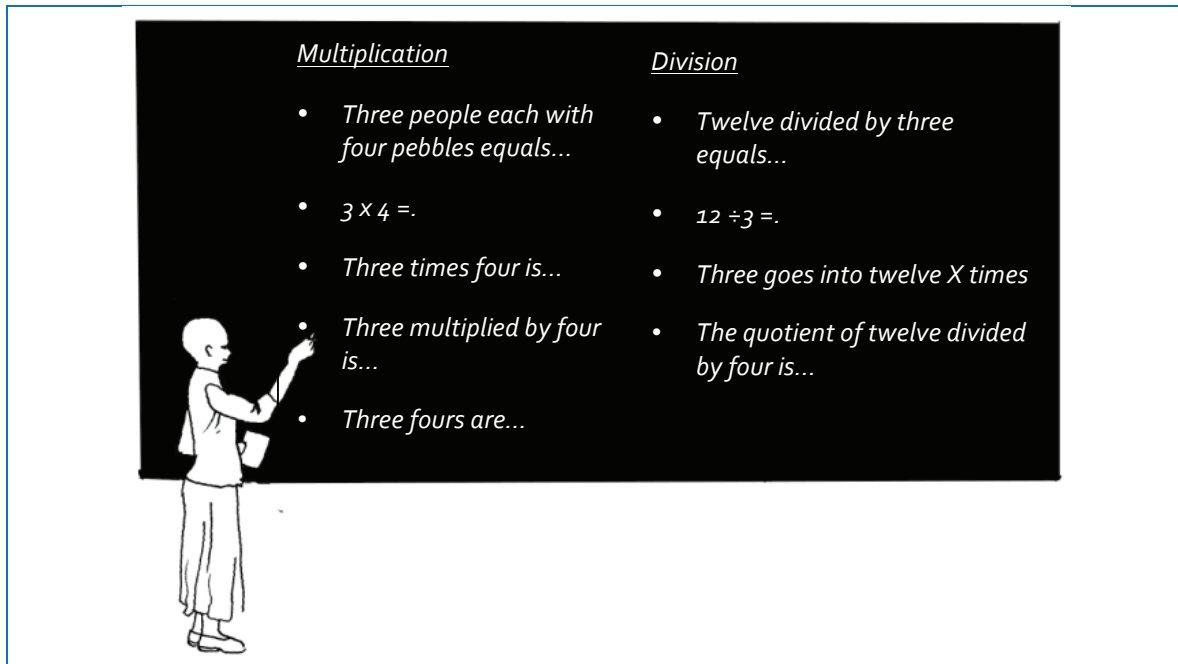
Stage 1

- Ask for three volunteers to come to the front. Give them four pebbles each.
- Say: *'How many pebbles does each one of you have?'* (Answer – Four.)
- Write on the board and say: *'Three people each with four pebbles equals... $3 \times 4 =$.'* Wait for the class to answer twelve. Introduce *'three fours are...'*
- Ask for four different volunteers to come to the front and count out five pebbles each. Ask the class what you should write on the board. Wait for them to answer $4 \times 5 = 20$.
- Make sure they are using both *multiplied by, times* and *four fives are....*
- The class chorus each version of the number sentence.
- Introduce *'the product of'* say: *'The product of four times five is twenty.'* Make sure that you have all of this vocabulary on one side of the board.

Stage 2

- Ask for four volunteers at the front. Give one student twelve pebbles. Ask them to divide the pebbles equally between the other three students.
- Say: *'How many pebbles does each one of you have?'* (Answer – Each will say four.)
- Write on the board and say: *'Twelve divided by three equals, $12 \div 3 =$.'* Wait for the class to answer four.
- Ask for five different volunteers to come to the front and count out twenty pebbles to one student. Ask the student to divide the pebbles equally between the four other students. Ask the class what you should write on the board. Wait for them to answer $20 \div 4 = 5$.
- Make sure they are using both *'divided by'* and *'goes into'*.
- The class chorus each version of the number sentence.
- Introduce *'the quotient of'* say: *'The quotient of twenty divided by four is five.'* Make sure that you have all of this vocabulary on the other side of the board.

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The image shows a teacher standing next to a blackboard. The blackboard is divided into two columns: Multiplication and Division. The teacher is pointing at the multiplication examples.

<u>Multiplication</u>	<u>Division</u>
<ul style="list-style-type: none">• Three people each with four pebbles equals...	<ul style="list-style-type: none">• Twelve divided by three equals...
<ul style="list-style-type: none">• $3 \times 4 =$.	<ul style="list-style-type: none">• $12 \div 3 =$.
<ul style="list-style-type: none">• Three times four is...	<ul style="list-style-type: none">• Three goes into twelve X times
<ul style="list-style-type: none">• Three multiplied by four is...	<ul style="list-style-type: none">• The quotient of twelve divided by four is...
<ul style="list-style-type: none">• Three fours are...	

Practice (5 mins)

- Say: 'Open your Student book at Topic 2, Lesson 4 and look at Activity 1.' Hold up your Student book and point to the activity. Say: 'Which topic, lesson and activity do you need?'
- Ask for a volunteer to come to the front and read out and complete the first number sentence.
- Ask the class to chorus the answer.
- Ask the class to work in pairs to read all of the number sentences using all of the language.

Consolidation/evaluation and assessment (10 mins)

- Say: 'Look at Activity 2.' Hold up your Student book and point to the activity.
- The students play the game in groups of four. They have to get from one side of the lake to the other without getting eaten by the crocodile. They take turns to step onto a stone by reading out loud and answering the number sentence. If they do not say it correctly they get eaten by the crocodile and are out of the game. The first to reach the other side is the winner.
- Tell them the rules and ask them to play the game.
- Monitor and make sure that students are using English.

Reflection

- Ask the students if there was any language structure that they found especially difficult to remember.
- Ask the students how they are going to learn these difficult structures.

Answers

Activity 1

$2 \times 6 =$ Two times six equals twelve; Two multiplied by six equals twelve; The product of two and six is twelve; Two sixes are twelve.

$8 \times 3 =$ Eight times three equals twenty-four; Eight multiplied by three equals twenty-four; The product of eight and three is twenty-four; Eight threes are twenty-four.

$10 \times 5 =$ Ten times five equals fifty; Ten multiplied by five equals fifty; The product of ten and five is fifty; Ten fives are fifty.

$27 \div 9 =$ Twenty-seven divided by nine equals three; Nine goes into twenty-seven three times; The quotient of twenty-seven divided by nine is three.

$36 \div 6 =$ Thirty-six divided by six equals six; Six goes into thirty-six six times; The quotient of thirty-six divided by six is six.

$45 \div 9 =$ Forty-five divided by nine equals five; Nine goes into forty-five five times; The quotient of forty-five divided by nine is five.

Extension activity



- Give the students small pieces of paper. They write a difficult multiplication or division number sentence without the answer, fold the paper up and put it into a small container at the front of the room.
- Divide the class into four teams. The first person from each team runs to the front, gets a piece of paper takes it back to their team and they all work out the sum. The student then runs back to the board, writes the number sentence on the board and says the number sentence out loud. If they say it correctly they win. If not, the next team gets a chance.
- The first team to read five correctly wins the game.

Teacher's reflections



- Ask yourself how well you managed to use all the structures equally and correctly as a model for the students.

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Homework

- Explain a game to students that they can play in the playground. The game is called '1, 2, 3 multiply with me'.
- Get two volunteers out to the front of the class to demonstrate. Ask them to stand facing each other and then shake their hands in front of them saying: '*1, 2, 3 multiply with me.*' On the word '*me*' they hold up any number of fingers at each other from 1 to 10. They multiply their two sets of numbers i.e. If one person is holding up three fingers and one person is holding up eight then they have to say $3 \times 8 = 24$ or the product of 3×8 is 24 or *3 multiplied by 8 is 24.* They then play again.

Lesson 5: Fractions

Vocabulary: a third; two thirds; a quarter; three quarters; a half; a sixth; two sixths; all fractions in numbers and words

Structures: What fraction is shaded/unshaded?; What fraction is this?

Lesson content objectives:

By the end of the lesson the students will be able to:

- recognise and say fractions
- write fractions in words and in numerals.

Learning strategy: Visual representations.

Preparation: You will need an orange, a knife, circles and rectangles of paper.

Introduction (5 mins)



- Say: 'Good morning/afternoon. How are you?' Wait for the students to reply.
- Show the students an orange and say: 'What is this?' Wait for a reply.
- Ask for a volunteer to come to the front of the class. Say: 'Cut the orange into two equal parts.'
- Ask: 'How many pieces of orange are there?' Wait for the class to say *two*. Write '2' on the board.
- Hold one half up and ask: 'How many pieces of the orange is this?' Wait for the class to say one. Write '1' above the two on the board and make it into a fraction.
- Ask: 'How much of the orange is this?' and point to the fraction on the board. Wait to see what the class says. Help them by saying: 'One piece out of two pieces, one over two, a half.'
- Ask the class to chorus the sentences as you say them.

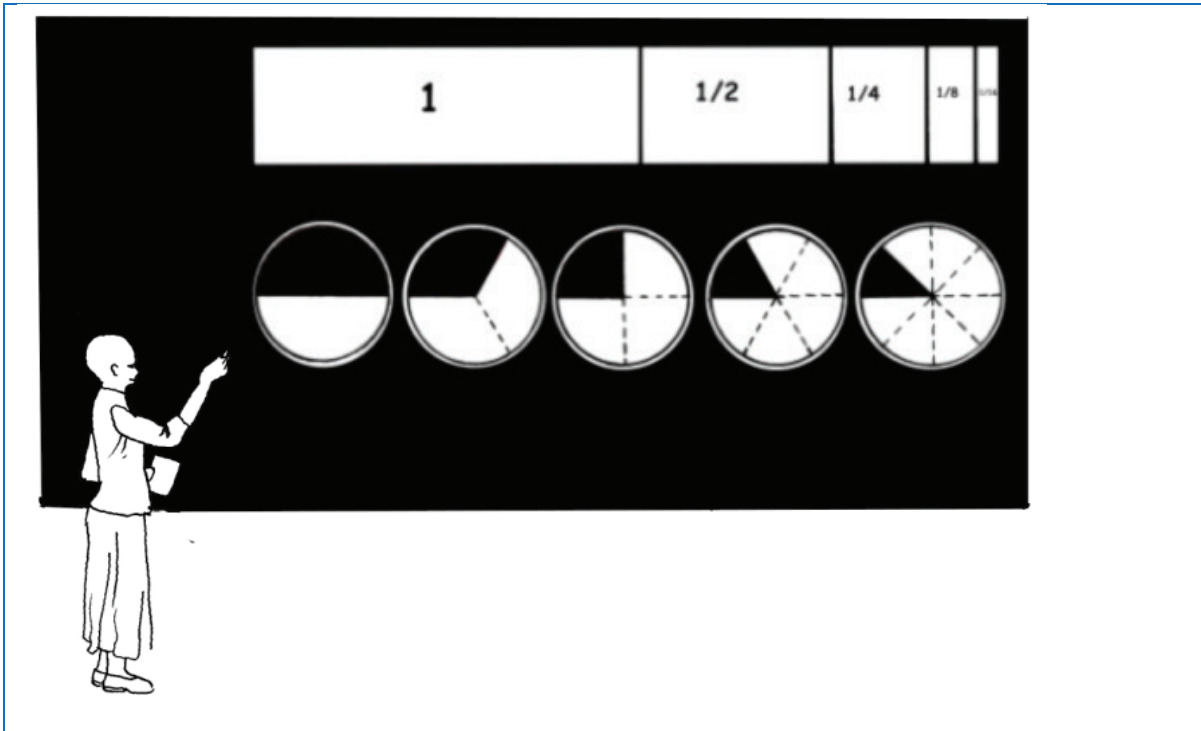
Presentation (10 mins)



- Draw a rectangle on the board. Say: 'This is bread.'
- Divide the rectangle into two equal parts and ask: 'How many equal parts are there in the rectangle?' Wait for the class to answer *two*.
- Ask: 'What fraction of the bread is this?' Wait for the class to answer *a half* and then write ' $\frac{1}{2}$ ' in one piece of the bread.
- Divide the other half of the bread into two equal parts and ask: 'What fraction of the bread is this?' Wait for the class to answer *a quarter* and write ' $\frac{1}{4}$ ' in the piece of bread.

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- Divide the final quarter into two equal pieces and ask: 'What fraction of the bread is this?' Wait for the class to answer *an eighth* and write $\frac{1}{8}$ in the piece of bread.
- Point to each part of the bread and ask: 'What fraction of the bread is this?' Wait for the students to chorus the fraction. Make sure that the students are pronouncing the 'th' at the end of the word.
- Draw a series of circles on the board and divide them into pieces and shade in $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, $\frac{1}{8}$.
- Ask the students what fraction the shaded areas of the circles are and later ask the same question about the unshaded areas. 'What fraction of the circle is shaded?'



Practice (10 mins)

- Say: 'Open your Student book at Topic 2, Lesson 5 and at Activity 1.' Hold up your Student book at the correct page and point to the activity. Ask: 'Which topic, lesson and activity do you need?'
- Say: 'Tell your partner the shaded and unshaded fractions of the rectangles.'
- Monitor the students as they work.

Stage 2

- Give each student a circle or rectangle of paper.
- Ask the students to fold the paper into any amount of equal parts and then shade some of it with a pencil.

- Ask the group to mingle, show others their paper and ask each other 'What fraction is shaded/unshaded?'
- Each student should ask at least six other students and answer their question.



Consolidation/evaluation and assessment (5 mins)



- Say: 'Look at Activity 2.' Hold up your Student book and point to the activity.
- The students write the fraction of each circle which is shaded in both numbers and words.

Reflection



- Ask the students whether they enjoyed the mingle activity. Did they think that it helped them to speak in English more easily or not?
- Say: 'Can you think of another way to use a mingle to help you learn English? Try to think of a way and tell me next lesson.'

Answers



Activity 1

- a) One fifth shaded, four fifths unshaded.
- b) One sixth shaded, five sixths unshaded.
- c) One tenth shaded, nine tenths unshaded.

Activity 2

- d) One half shaded. $\frac{1}{2}$
- e) One third shaded. $\frac{1}{3}$

Topic 2: Numbers

- f) Two thirds shaded. $\frac{2}{3}$
- g) One quarter shaded. $\frac{1}{4}$
- h) Three quarters shaded. $\frac{3}{4}$
- i) One sixth shaded. $\frac{1}{6}$

Extension activity (5 mins)



- Each learner writes down one fraction on a piece of paper and swaps the paper with their partner. The partner reads the fraction and tries to write it in words.
- You can also ask the students to give the rest of the fraction that would make it up to a whole number. For example if they write $\frac{3}{8}$ then the rest of the fraction would be $\frac{5}{8}$.

Teacher's reflections



- How did the students manage with the fractions topic? Were there any conceptual or language issues? How will you check that all the students understand the language and concepts?

Lesson 6: Decimals and place value

Vocabulary: decimal point; decimal place; digit; zero; point; ones/units; tenths; hundredths; thousandths; and (as a substitute for the decimal point)

Structures: What's the place value of...; Round off to... decimal places.

Lesson content objectives:

By the end of the lesson the students will be able to:

- read decimals
- state decimal place
- round up and round down to a given number of decimal places.

Learning strategy: Organising and sorting; place value; kinaesthetic students will appreciate the opportunity to move and learn.

Preparation: Make a set of number cards of the numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9 and a decimal point card.



Introduction (5 mins)

- Say: 'Good morning/afternoon. How are you?' Wait for the students to reply.
- Write any seven numbers on the board. Point to each number and get the class to say each number as you point to it.
- Point to the numbers in any order getting faster and get the class to say the number as you point to them. They should try to keep up as you go faster.
- Ask one student to read the numbers in ascending order.
- Ask another student to read the numbers in descending order.
- Write these decimals on the board: 0.01, 0.25, 0.5, 0.71, 0.99 and ask what they are. (Answer – Decimals)
- Get the class to say the word *decimals* three times.
- Ask one student to write the word 'decimals' on the board. The rest of the class to help with the spelling by shouting out the letters.

Topic 2: Numbers

Presentation (10 mins)

- Ask for the meaning of the word 'decimal'. (Answer – Fractions (parts) of numbers, they usually have a decimal point to separate the whole numbers from the part numbers.)
- In pairs, the students decide how to say 0.99. (Answer – Zero point nine nine.)
- When you have got the answer ask the students to repeat it after you.
- Repeat for all of the decimals. Get the answers from different pairs each time.

Note: 0.99 is commonly read as nought point... as well as zero point... and point nine nine.

- Draw the following table on the board.

Ones (units)	.	tenths	hundredths	thousandths
3	.	6	2	5

- Ask for a volunteer to read the number. Repeat the correct answer clearly and ask the class to repeat it. (Answer – Three point six two five)
- Ask:
 - What is the place value of the three? (Answer – whole units/ones)
 - What is the place value of the six? (Answer – $\frac{6}{10}$, six tenths)
 - What is the place value of the two? (Answer – $\frac{2}{100}$, two hundredths)
 - What is the place value of the five? (Answer – $\frac{5}{1000}$, five thousandths)

Note: take care with the pronunciation of the 'ths' at the end of each of these.

- Write other examples 0.3, 0.45, 0.139 in the table and ask: 'How many decimal places in this number?' Different students answer each one. (Answer - the number of decimal places is the number of digits after the decimal point e.g. 0.3= one decimal place, 0.45 = two, 0.139 = three.)

Game (Optional – 5 mins)

- Give out the set of number and the decimal point cards to ten students and ask them to come to the front and hold the card facing the rest of the class.
- Tell these students to arrange themselves to make the decimal that you shout out. Shout out: '2.467' and the students with these numbers arrange themselves to make this decimal. Those that are holding numbers that are not needed stay at the side of the room.

- Get the rest of the class to read out the number they can see and check that it is correct. If it is not correct the class should help the group to get into the correct order.
- When it is correct ask: *'How many decimal places does this decimal have?'* (Answer – Three decimal places.)
- Ask the students to *round up* and *round down* to a number of decimal places and the final number may have to change.
- Repeat this with other numbers and their decimal places. Make sure you keep a note of the decimals you are asking them to form so that you do not forget!
- Change the ten students and repeat.

Practice (10 mins)    

- Say: *'Open your Student book at Topic 2, Lesson 6 and look at Activity 1.'* Hold up your Student book at the correct page and point to the activity. Ask: *'Which page do you need?'* Wait for the students to reply.
- Ask for a volunteer to come to the front of the class to help you to demonstrate.
- Say: *'Four and 124 thousandths.'*
- Encourage the students to write the number in the table in their Student book and say the decimal as they write. (Answer – Four point one two four.)
- In pairs, the students dictate at least five of these numbers each and write them on their table.

Note: If the students are having difficulty you can sit the pairs, one facing the board and one facing away. You can write some decimals on the board. For example five and 126 thousandths; three and 44 hundredths. Later swap so the other partner can see the board, but don't forget to change the numbers.

- Monitor and help students who are having difficulties.

Consolidation/evaluation and assessment (5 mins)   

- Say: *'Look at Activity 2.'* Hold up your Student book at the correct page and point to the activity. Ask: *'Which topic, lesson and activity is this?'* Wait for the students to reply.
- NOTE: A number is rounded down if the next digit is less than five i.e. 0, 1, 2, 3, 4. A number is rounded up if the next digit is greater than four i.e. 5, 6, 7, 8 and 9.
- Individually students complete the activity in their exercise books.
- Monitor and evaluate how the students are doing.
- Repeat a few more examples using the number card game if more practice is needed.

Topic 2: Numbers

Reflection

- Ask the students what they found easy and difficult about expressing themselves in this topic. Ask them to think about whether they have the same difficulties in their own language. They should think about how they would correct this in their own language and then see if they could apply this in English.

Answers

Activity 2

0.6 = zero point six

0.4 = zero point four (rounded to one decimal place)

0.85 = zero point eight five (rounded to two decimal places)

0.130 = zero point one three zero (rounded to three decimal places)

0.045 = zero point zero four five (rounded to three decimal places)

Extension activity

- Play another number card game. Split the class into two and ask one group to the front of the class. Hand out cards to this group and ask them to decide on a number together, hold up the cards, and state a number of decimal places. The rest of the class say the number to the stated number of decimal places.
- You can make this into a team game playing for points.

Teacher's reflections

- Think about how you are helping the students to express themselves in this topic. They should be finding the concepts easy to manipulate because it is a revision from primary. If there are students who you think do not understand the concepts think about how you are going to refer them to more help.

Homework

- Students could make their own card game at home and bring in ideas for other games to play with cards and decimals.

Lesson 7: Percentages

Vocabulary: percentage/percent; per; express

Structures: What is X percent of Y?; Find the percentage of...

Lesson content objectives:

By the end of the lesson the students will be able to:

- identify percentages
- read percentages
- write percentages in words and numerals.

Learning strategies: Revision of small chunks through a quiz

Preparation: You will need three small pieces of paper for each student



Introduction (10 mins)

- Say: 'Good morning/afternoon. How are you?' Wait for the students to reply.
- Say: 'Today we are going to do a quiz.'
- Put the students in pairs and give them each three pieces of paper. They write 'true' on one and 'false' on another and the final one is for their answers.
- Write each of the sentences on the board one at a time. The students discuss their answers and then write 'true' or 'false' on the answer paper.

Quiz questions:

1. Two thirds is two out of three.
 2. Zero point five is equivalent to five.
 3. The plural for a 'half' is 'halves'.
 4. Ascending order is arranging from smallest to largest.
 5. Three sixths is six out of three.
 6. 0.001 is one hundredth.
- When you have finished, the students check their answers together.
 - They put their answers where they can see them and get their true/false cards.
 - Ask for a different volunteer to come and read each question off the board and each pair holds up either their true or false card. Check what they are holding up. Then students mark their answer paper with a tick or cross.

Topic 2: Numbers

- At the end discuss how many are true and how many are false. Say that there are three bonus questions and when you ask the question the first student to put their hand up will get the chance to answer.
- Ask: *'How many answers are true and how many are false?'* (Answer – Three true and three false.)
- Ask: *'What is that as a fraction?'* (Answer – a half.)
- Ask: *'What is that as a decimal?'* (Answer – 0.5.)
- Find out which pair has the most points and congratulate them.

Presentation (5 mins)

- Ask: *'What other way can we express three out of six?'* Wait for the students to reply. We hope they will say percentage. If they don't then tell them it is 'percentages'.
- Write the *percent* symbol on the board - %. Write: '%. - per cent means per hundred or out of a hundred.'
- Ask eight students to come up to the board and ask each one to write any percentage on the board. Ask each what that percentage means out of a hundred, for example, twenty percent is twenty per/out of a hundred. Then ask how much that percentage would be out of two hundred. *'Twenty percent is forty out of two hundred.'*
- Do a few more as examples.

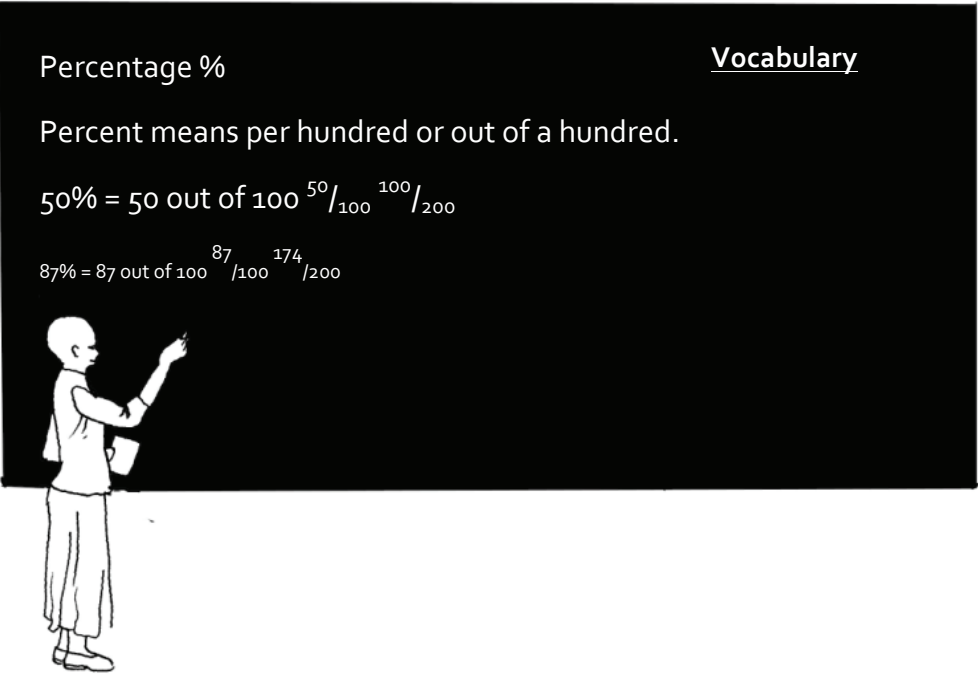
Percentage %

Percent means per hundred or out of a hundred.

$50\% = 50 \text{ out of } 100 \quad \frac{50}{100} \quad \frac{100}{200}$

$87\% = 87 \text{ out of } 100 \quad \frac{87}{100} \quad \frac{174}{200}$

Vocabulary



Practice (10 mins)    

- Say: 'Open your Student book at Topic 2, Lesson 7 and look at Activity 1.' Hold up your Student book at the correct page and point to the activity.
- Ask the students to work in pairs. Tell them to look at the first question as a class and tell you how many of the numbers are percentages (Answer – four).
- Choose students to read out the ones which are percentages.
- Ask the class to work in pairs to read out the percentages to each other. Tell them to take turns. They can read the percentages in any order. Their partner should listen and say what colour the percentage is. Monitor and help the students and make sure that they are speaking in English.

Consolidation/evaluation and assessment (5 mins)     

- Say: 'Look at Activity 2.' Hold up your Student book and point to the activity.
- Say: 'Copy and complete the table in your exercise books'.
- When they have finished tell them to compare their answers in pairs.
- Monitor and help the students

Topic 2: Numbers

Reflection

- Ask the students whether they work better and enjoy learning more working in pairs, groups or on their own. Ask whether sometimes they would like to choose how they work on an activity.

Answers

Introduction quiz

1. Two thirds is two out of three. TRUE
2. Zero point five is equivalent to five. FALSE
3. The plural for a 'half' is 'halves'. TRUE
4. Ascending order is arranging from smallest to largest. TRUE
5. Three sixths is six out of three. FALSE – it is three out of six.
6. 0.001 is one hundredth. FALSE – it is one thousandth.

How many answers are true and how many are false? Three true and three false.

What is that as a fraction? Half.

What is that as a decimal? 0.5.

Activity 1

52%	30%	52%	30%
52	60		
17	60%		60%
100	$\frac{60}{100}$		$\frac{60}{100}$

Spoken numbers:

20% - 'Twenty percent'

30% - 'Thirty percent'

40% - 'Forty percent'

100% - 'One hundred percent'

1% - 'One percent'

0.25% - 'Zero point two five percent'

75% - 'Seventy five percent'

0.01% - 'Zero point zero one percent'

Activity 2

12%	Twelve percent	Twenty seven percent	27%
36%	Thirty six percent	One percent	1%
89%	Eighty nine percent	Zero point five three percent	0.53%
50%	Fifty percent	Zero point one two zero five percent	0.1205%
99%	Ninety nine percent	Half a percent	$\frac{1}{2}\%$ or 0.5%

Extension activity



- Write these calculations on the board
 - 10% of 230
 - 15% of 200
 - 59% of 344
 - 75% of 4
- Say: 'Calculate the answers with your partner.'
- Tell them that when they have finished, they must write down one extra percentage calculation on a piece of paper for another pair of students.
- Tell them to compare their answers to the four questions with another pair, then swap papers with the other pair. They must read the calculation and give the answer. Collect any very good questions and keep them to start the next lesson as a quiz.

Teacher's reflections



- Think about the answers the students gave you about whether they prefer working in groups, pairs or on their own. How might you offer them opportunities to work in the way they feel is best for them?

Topic 2: Numbers

Lesson 8: Converting fractions, decimals and percentages

Vocabulary: Percentage/ percent; per; express; decimal; fraction

Structures: What is X percent of Y?; Find the percentage of...; Express X as a Y; X as a Y is...

Lesson content objectives:

By the end of the lesson, the students will be able to:

- convert between fractions, decimals and percentages

Learning strategy: Using games to learn

Preparation: You will need sheets of A4 paper; cards containing the answers for the introduction activity. You will need to prepare these cards.

Note: The 'Introduction' might be better done outside where there is plenty of space.

Introduction (10 mins)



- Use any of the questions the students produced in the previous lesson in the extension activity. If you did not do this activity write some new questions.

Note: the questions were 'find the percentage of...' type questions, such as, What is 35% of 200?

You will need at least ten questions.

- Write the answers to the questions on separate cards. Put these on or near the board at the front of the class.
- Put the class into teams of ten and line them up at the far end of the room facing the answer cards.

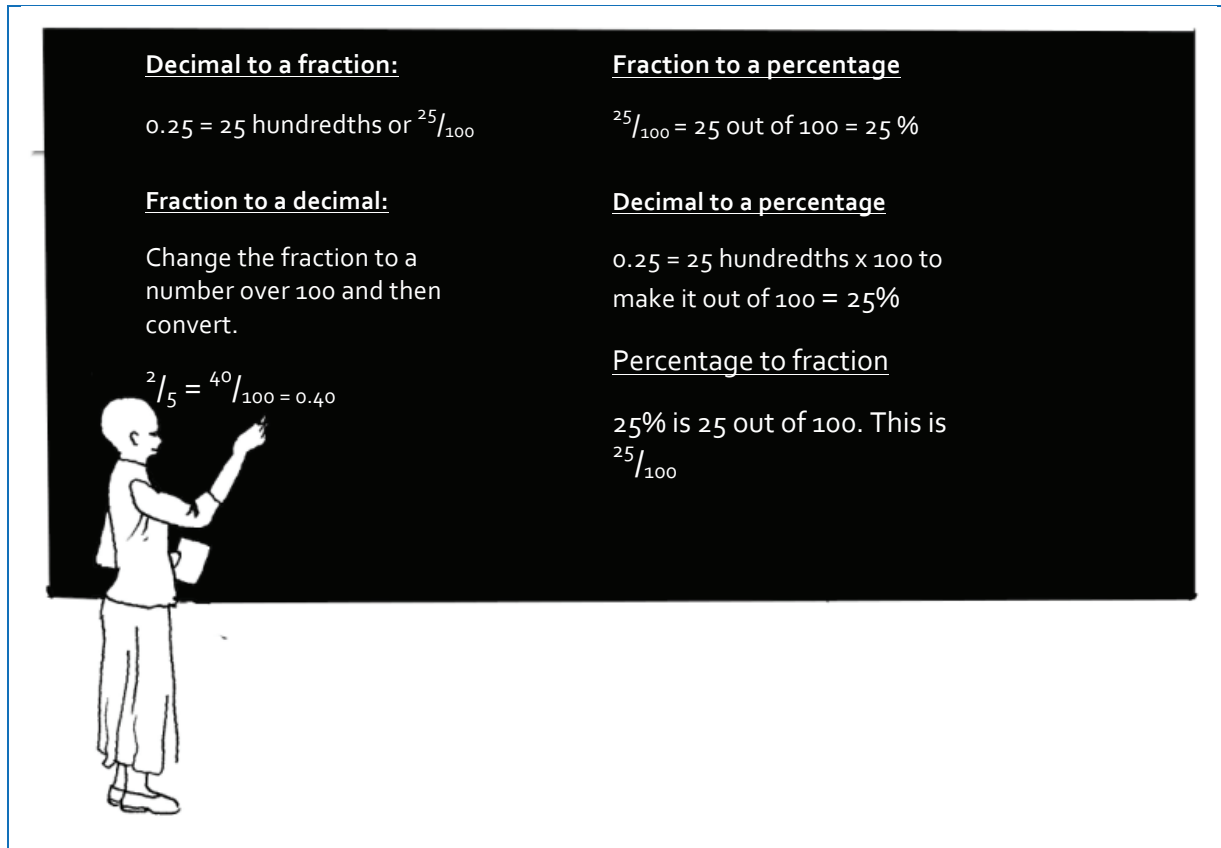


- Shout out the question and the first person in each team runs to the board and grabs the answer. They must say the question and the answer out loud to the class once they have grabbed it. The class decides who is correct and which team should get the point. You have the final decision.

Presentation (10 mins)

- Ask: 'What ways have we looked at for expressing numbers?' Write the answers on the board. (Answer – Fractions, decimals and percentages.)
- Write the decimal 0.3 on the board and ask: 'What's the equivalent as a fraction?' Wait for the students to say $\frac{30}{100}$. Then ask: 'What's the equivalent as a percentage?' Wait for the students to say 30%.
- For the students who are not able to produce the answers, demonstrate how this is done on the board.
- Give examples of all of the conversions and ask the students to calculate them as you go through them.
- Use a range of language as given in the structure list above.

Topic 2: Numbers



Decimal to a fraction:
 $0.25 = 25$ hundredths or $\frac{25}{100}$

Fraction to a decimal:
Change the fraction to a number over 100 and then convert.
 $\frac{2}{5} = \frac{40}{100} = 0.40$

Fraction to a percentage:
 $\frac{25}{100} = 25$ out of 100 = 25 %

Decimal to a percentage:
 $0.25 = 25$ hundredths $\times 100$ to make it out of 100 = 25%

Percentage to fraction:
25% is 25 out of 100. This is $\frac{25}{100}$

Practice (5 mins)



- Put the students into groups of three and give them all a piece of A4 paper which they rip up into eight equal smaller pieces.
- Say: 'You are going to play a game called Slap'. Tell them to choose one student to be the leader. The leader says a fraction, percentage or decimal. The other two students write an equivalent fraction, decimal or percentage on a piece of paper as fast as they can and slap it on the table. The person who slaps the table first has to say their equivalent and the rest of the students check that they are correct. This person then becomes the leader.

Consolidation/evaluation and assessment (5 mins)



- Tell students to open their exercise books.
- Say: 'Open your Student book at Topic 2, Lesson 8 and look at Activity 1.' Hold up your Student book at the correct page and point to the activity.
- Tell the students to copy and fill in the table in their exercise books.
- Say: 'In pairs, compare and discuss your answers.'

- Monitor and help the students and make sure that they are speaking in English.

Reflection

- Ask the students to think about the three different ways of expressing amounts. Ask them to draw a diagram that best shows the language used for each way.
- Say: 'Think about real life situations where you have to use fractions, decimals and percentages. When does this happen? Could you try to use English next time?'

Answers

Activity 1

	Fraction	Decimal	Percentage
Example:	$\frac{75}{100}$	0.75	75%
a	$\frac{50}{100}$	0.5	50%
b	$\frac{1}{100}$	0.01	1%
c	$\frac{25}{100}$	0.25	25%
d	$\frac{35}{100}$	0.35	35%
e	$\frac{40}{100}$	0.4	40%

Extension activity

- Write a list of percentages, decimals and fractions on the board and ask the students to convert them to the other two as quickly as possible in pairs. The pair who convert them the quickest and say the most correct in English are the winners.
- Select individual students to read the answers and others to make corrections.

Teacher's reflections

- Sometimes students learn better from looking at diagrams and charts rather than from listening to the teacher. Do you use these enough?

Homework

- Ask the students to try to use English next time they are in a shop or a place where they might understand English. The more practice they get the more they will understand.

Topic 2: Numbers

Lesson 9: Integers

Vocabulary: positive integers; negative integers; above/below zero; freezing; boiling; minus; degrees centigrade; temperature; thermometer; profit; loss; higher; lower; more; less

Structures: Is this a negative/positive number?; It's a positive/negative number; What's the temperature?; Which temperature is colder? Is the temperature above/below freezing/boiling?

Lesson content objectives:

By the end of the lesson the students will be able to:

- identify positive and negative numbers
- relate the use of positive and negative numbers to real life situations.

Learning strategies: Lines as graphic organisers; using the top right hand corner of the board as a place for vocabulary notes and translations.


Introduction (5 mins)



- Ask the students whether they know what a number line is. Wait for an answer. (Answer – Should mention the words: line of numbers; in ascending/descending order; sequential).
- Draw a long line on the board and mark off ten equal parts along the line.
- Tell students that you are going to put integers on the line. Ask what an integer is. Wait for an answer. (Answer - Integers are whole numbers).
- Ask where zero should go. They may answer at the end but the answer is in the middle of the line because we are going to include negative integers. Add the zero onto the middle of the line. Then ask the students to help you to put the integers 1 to 5 on the line. Finally ask what goes on the left of the zero. Add in the negative integers negative 1 to negative 5.

Note: We use negative to describe an integer/number and we use minus to describe a mathematical operation. You can describe it as negative is the noun and minus is the verb. However, we often use minus before a number for describing a temperature below zero.

BITITI'S SHOP	Vocabulary
A profit is positive (+) a loss is negative (-)	minus
Year 1: profit of + 5,000,000	higher
Year 2: loss of - 1,000,000	lower
Overall profit of + 4,000,000	more than
	less than



Presentation (10 mins)



- Say: 'Numbers on the right are positive and marked with plus, positive sign. Numbers on the left side are negative and marked with a negative sign.'
- Point and read each of the negative numbers, zero, -1, -2, -3, -4 and -5 and get the class to chorus each of the numbers as you point to it.
- Ask: 'Where do we see negative numbers in our lives?' Wait for an answer. Temperatures; finance; geography: when looking at heights of the land above and below sea level; gravity as a downward force; latitudes and longitudes; goal difference in sport.
- Draw a thermometer on the board. Ask the students where you will see temperatures that are in negative numbers. (Answer – Most northern European countries; the Arctic and the Antarctic, Asia, North America.)
- Write the words 'Bititi's shop' on the board. Say: 'This is Bititi's shop and it sells lots of different things to the neighbourhood. Last year she did really well and made a profit of 5,000,000 Tanzanian shillings. Is this positive or negative? This year has not been such a good year and she has made a loss of 1,000,000 Tanzanian shillings. Is this positive or negative? Overall has she made a profit or loss? Is it positive or negative?'
- Write on the board: 'A profit is positive. A loss is negative'.

Topic 2: Numbers

- Ask a student to come to the front and write the numbers for this story on the board as you retell the story.

Practice (10 mins)

- Say: 'Open your Student book at Topic 2, Lesson 9 and look at Activity 1.' Hold up your Student book at the correct page and point to the activity. Ask: 'Which page are you looking for?'
- Put the students in pairs and name them A and B.
- They read the list of integers to each other. The partner checks they are correct.
- The students complete the rest of the activity together. You can help them by indicating with hand gestures the meaning of higher, lower, more and less than. These can be written on the top right hand side of the board.

Note: It is a good idea to keep the top right hand side of the board as a place for vocabulary and translations. This way the students know where to look when they need help with a word. If anyone in the class asks for a spelling or translation then you can write it here so that it is there for the rest of the class. Make sure that you let the class know what kind of word each is: (n) = noun; (v) = verb; (adv) = adverb; (adj) = adjective, etc.

Consolidation/evaluation and assessment (5 mins)

- Say: 'Look at Activity 2.' Hold up your Student book and point to the activity.
- In pairs they sort the numbers and put them on the number line.
- Monitor and check that the students are writing them correctly and speaking in English.

Reflection

- Ask the students whether thinking about how the numbers are used in real life such as the thermometer helped them to remember the language.
- How else do they remember the key language?

Homework

- Students could check at home with their families any other uses of negative integers in life. They can discuss this in Kiswahili with their family but must report back in English.

Answers

Activity 1

Student A

Negative ten, positive twelve, negative seven, negative one, zero, positive three, positive nine, negative four, positive six.

Student B

Negative five, positive fourteen, negative three, negative twenty-two, zero, positive six, positive nine, negative one, positive five.

a Less/lower than

b More/higher than

c Lower/less than

d Minus (negative) six

e Loss of 2,500 shillings (-2,500)

f Tanzania +3 goal difference and Egypt negative two goal difference so Tanzania go through to the next stage.

Activity 2

-15, -8, -6, -3, 0, 4, 5, 7, 8

Extension activity

Ask the students to discuss with a partner whether they are interested in business or economy as a future career or job.

Teacher's reflections

- Think about the students' answers to the reflection question. The more you can relate the topics to the students' life experiences the better they will understand and learn the concepts. Knowing that what they are learning is useful in their daily lives is more motivating for the students.

Lesson 10: Number patterns

Vocabulary: Odd; even; multiple of; ascending; descending; divisible by; fraction; percentage; decimal; rule; term

Structures: What's the rule? ; What's the next term?; What is ('s) the next number in the sequence?

Lesson content objectives:

By the end of the lesson the students will be able to:

- identify patterns of numbers
- identify numbers within a pattern
- create number patterns.

Learning strategy: Ordering of patterns of numbers.

Preparation: Prepare number cards for each student in the class. They should include the numbers 1 to 30 and some fractions, decimals and a few negative numbers.

Introduction (5 mins)

- Give out a number card to each student in the class. Tell them to look at their number and hold it in front of them.
- Tell them to stand up if they hear a group that their number belongs to.
- Say: *'Stand up if you are a multiple of X. /An odd number./An even number./Divisible by Y./A negative number./A positive number./A fraction./A decimal.'*
- Ask the questions faster and faster to see if you can catch anyone out.

Presentation (10 mins)

- Ask all the students with an even number to come to the front and arrange themselves in ascending order, holding their number up in front of them. Ask: *'What is the rule?'* (Answer – The rule is add two.) Ask the students what the next term is. That is the next number in the pattern.
- Take out every other number so that the numbers go up in multiples of four. Ask the students what the rule is now. (Answer – The rule is add four.)

- Ask the students with negative numbers to come to the front and line up in descending order, holding their number up in front of them. Ask what the rule is. (Answer – The rule is subtract two.)
- Ask the students what the next term is. That is the next number in the pattern. This may be a negative number.
- Take out every other number so that the numbers go down in multiples of four. Ask the students what the rule is now. (Answer – The rule is subtract four.)
- Ask the numbers 5, 8, 14, 26 to come to the front and stand in order. Ask what the rule is. (Answer – The rule is subtract one, multiply by two.) Ask students what the next term in the pattern is. (Answer – 50)



Practice (10 mins)    

- Say: ‘Open your Student book at Topic 2, Lesson 10 and look at Activity 1.’ Hold up your Student book at the correct page and point to the activity. Ask: ‘Which topic, lesson and activity do you need?’
- In pairs the students decide what a number pattern is. Feedback on their answers and write this on the board for the class to copy.
- Ask the students to solve the number patterns giving the rule and the missing numbers.
- Monitor and check that the students are doing the activity in English.
- When they have done them check the answers.

Topic 2: Numbers

Consolidation/evaluation and assessment (5 mins)



- In pairs the students think of a rule and make a number pattern for that rule.
- Ask the students to share their number pattern with another pair to see if they can solve it.

Reflection



- Ask students whether they enjoyed making number patterns. Did using the numbers in a game-like activity help them to learn and use them better?

Answers



Activity 1

A number pattern is: a set of numbers organised to follow a rule or formula.

- a** 3, 6, 9, __, 15, __. Missing terms 12 and 18. Rule add 3.
- b** 3, 8, 13, 18, 23, __, __. Missing terms 28 and 33. Rule add five.
- c** 11, 8, 5, 2, __, __. Missing terms -1 and -4. Rule subtract 3.
- d** 2, 4, 8, 16, __, __. Missing terms 32 and 64. Rule double.
- e** -5, -8, -11, -14, -17, __, __. Missing terms -20 and -23. Rule subtract 3.
- f** 1, 4, 9, 16, __, __. Missing terms 25 and 36. Rule square numbers.
- g** 1, 3, 6, 10, 15, __, __. Missing terms 21 and 28. Rule triangular numbers.
- h** $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, __, __. Missing terms $\frac{5}{6}$ and $\frac{6}{7}$. Rule $\frac{\text{plus } 1}{\text{plus } 1}$.
- i** 0.1, 1.2, 2.3, 3.4, __, __. Missing terms 4.5 and 5.6. Rule add 1.1
- j** __, __, 0.33, 0.44, 0.55, __, __. Missing terms 0.11, 0.22, 0.66, 0.77. Rule add 0.11.
- k** __, __, 14, 30, 62, 126, __, __. Missing terms 2, 6, 254, 510. Rule double add 2.

Extension activity



- Say: 'Make notes on two patterns of numbers. Dictate the pattern to your partner. Then ask them the rule and the next two terms of the pattern.'
- Say: 'Check the answers with your partner.'

Teacher's reflections

- Think about your students' answers to the reflection question. How could you include more game like activities in your lessons in order to help them to learn?

Homework

- Say *'Do you think you could write your own number patterns at home? Could you get help from other people in your family? They might be interested in finding out what you are doing at school. They may be able to test you with your numbers'*.