

The National **Numeracy Strategy**

SPRINGBOARD

5

Mathematics catch-up
programme for Year 5

ACKNOWLEDGEMENT

This initiative has been based on a catch-up programme for Year 5 originally devised by the Hamilton Trust for use in schools in the Hamilton Oxford Schools Partnership. The National Numeracy Strategy would like to thank the Hamilton Trust for permission to draw freely on the materials written for their programme.

The National Numeracy Strategy (NNS) is designed to raise standards in mathematics for all children in Key Stages 1 and 2. The Government has set a target of 75% of 11-year-olds to achieve level 4 in mathematics by 2002.

Without carefully targeted help, some children in Year 5 are likely to achieve level 3 rather than level 4 in mathematics at the end of Key Stage 2. A high proportion of these children have the potential to catch up, given a well-planned programme and targeted teaching. Springboard 5 helps to provide such a programme. The mathematical knowledge and skills that it addresses are crucial if these children are to fulfil their potential in the subject in Year 6 and beyond in Key Stage 3.

These materials have been based on tried and tested weekly units of work originally developed by the Hamilton Maths Project and used successfully in schools in the Oxford Education Action Zone. Some changes have been made to cater for national dissemination but the mathematical content and approach to teaching remain essentially the same.

Springboard 5 is designed for teaching in the autumn and spring terms. It aims to bring children up to a level where they can more easily access the Year 5 teaching programme in the *Framework for teaching mathematics*. It does not replace this programme, but complements it. The Springboard 5 initiative should be run in addition to, not instead of, the daily mathematics lesson.

This guidance is for Year 5 teachers, other teachers who are involved directly with teaching the Springboard programme, teaching assistants and mathematics co-ordinators. It is organised in three sections:

PART 1

Introductory notes on planning and teaching the Springboard 5 programme, including the role of the teaching assistant

PART 2

Teaching objectives of the weekly teaching units and their link with the Year 5 teaching programme

PART 3

Teaching materials: 10 weekly units of work with teaching notes for the main lesson and follow-up session, photocopiable activity sheets and homework tasks

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PART 1

AIMS

Springboard 5 is for use in Year 5. It is intended specifically for children who, without extra help, are likely to achieve level 3 in mathematics at the end of Key Stage 2. Its main aims are:

- to support the identified children and to tackle their weaknesses in mathematics so that they are in a better position to access the Year 5 and 6 teaching programmes;
- to set the expectation that these children will catch up with their peers and achieve level 4 at the end of Key Stage 2;
- to help teachers to prepare a teaching programme that enables the children to benefit fully from the main teaching programme for Year 5 as soon as possible.

THE SPRINGBOARD 5 MATERIALS

The materials have been designed as a stand-alone 10-week course to be delivered to children in groups of 8–12. Some schools will receive funding to support the Springboard 5 initiative. Year 5 teachers in other schools may decide to deliver the course in full or to draw on the materials for use with children who do not have a sufficiently firm grasp of the groundwork required for the Year 5 teaching programme.

Springboard 5 consists of ten weekly units of work, preferably for use in the autumn and spring terms. There is a 50-minute lead lesson and a 45-minute follow-up session that consolidates the work introduced in the lead lesson and, in some cases, takes it a small step further. Three photocopiable activity sheets are provided for each weekly unit of work. One of these is introduced in the main lesson and another in the follow-up session. The third can be completed by children requiring further consolidation or as revision at a later stage. There is also a short weekly homework task to be completed between the lead lesson and the follow-up session.

The units of work cover carefully selected teaching objectives in number taken from the Year 4, and sometimes the Year 3, teaching programmes. It is essential that children meet these objectives if they are to tackle with confidence the key objectives of the Year 5 and 6 teaching programmes, and obtain a level 4 in the Key Stage 2 national tests. Each unit has a detailed lesson plan for both the lead lesson and the follow-up session with a teaching assistant. Teaching objectives, vocabulary and resources are listed as well as teaching points and key questions. Each lesson and follow-up session follows the three-part lesson model developed by the National Numeracy Strategy.

TEACHING TIME

The materials are designed with an assumption that the lead lesson of 50 minutes is taught by a teacher, probably the Year 5 class teacher or the SENCO, and the follow-up session of 45 minutes is led by a teaching assistant. The lead lesson and follow-up session are in addition to the daily mathematics lesson for Year 5 in which the identified children should also participate. Each school will decide when the Springboard 5 lesson and follow-up session take place. It may be possible to find temporary slots during the school day for the 10 weeks of the course. Alternatively, you could establish a breakfast or after-school club which meets twice a week. Schools with a long lunch break may be able to hold sessions at this time of day.

USING THE MATERIALS

The materials provide considerable support for each weekly unit of work. You will, however, need to take into account the responses of your children and adjust your teaching according to the progress they make. Individual children are, of course, not necessarily at the same level of attainment in all their mathematical work and will need more help and opportunities for consolidation in some areas than in others. The materials will not do all your preparation for you, but should give you a firm structure for your teaching.

THE VIDEO SEQUENCES

The video sequences show ways in which you might approach Springboard 5 lessons. They show how the material to be taught should be broken down into small steps and demonstrate appropriate lines of questioning. The lessons are based on the same teaching objectives as the lead lessons and the content is very similar. They have been slightly amended, where necessary, to meet the specific needs of the children being filmed.

The National Numeracy Strategy is indebted to colleagues and children who made arrangements for, and took part in, the filming from the Hamilton Oxford Schools Partnership, Birmingham LEA and Highfield Junior and Infant School.

ROLE OF THE TEACHING ASSISTANT

The teaching assistant supporting the Springboard 5 teacher will attend the main lesson each week to observe what has been taught and the mathematical vocabulary introduced. In order to gauge the progress the children are making, s/he will be able to listen to the children's responses to the teacher's questions and help them as they complete their work. Where schools receive funding to support Springboard 5, this should allow not only for the assistant to observe the lesson but also to spend time afterwards discussing the plan for the follow-up session with the teacher, mapping out exactly what is to be done and how to approach it.

Although the plans provided are detailed, the assistant and teacher will need to make adjustments in the light of the children's progress in the lead lesson. It will also be important for the teacher to receive information about the progress made by children in the follow-up session. A good way to do this is for the assistant to make brief entries on the feedback sheet (see page 13) at the end of the session each week so that the vital information is not lost.

TARGET SETTING

To evaluate the programme, it helps to set targets for children and measure how successfully they are met. For example, you could set targets for all the children in the year-group, specifying the proportion you expect to achieve in line with the set of key objectives for Year 5 by the end of the school year. One measure of success could be an assessment of a child's work related to key objectives compared with examples in the QCA document, *Standards in mathematics*, and in the supplements of examples in the *Framework for teaching mathematics from Reception to Year 6*. Another measure could be the results of QCA's optional tests for mathematics for Year 5.

You may also wish to set targets for individuals that give you and your children more immediate information on the progress they are making over shorter periods of time. You can gauge the progress individual children are making by their responses in the oral questioning – which is an important element of the programme – and by their work on the activity sheets. Short-term targets could, for example, be linked to improving knowledge of number facts or to responding more quickly to set tasks. Such targets can help you monitor children's overall progress in mathematics and judge the effectiveness of the programme of support. Your school may well have target-setting procedures already in place for the daily mathematics lesson. These should also be used for Springboard 5.

INVOLVING CHILDREN AND THEIR PARENTS OR CARERS

A key feature of effective teaching is to involve children in improving their performance by discussing with them what they can do and what they need to improve. Pupils are better motivated when they understand what they are to achieve and recognise the progress they are making. A brief discussion with a child on what they have achieved can lead to a new target and a suitable deadline for achieving it. During the discussion, you could stress how the child's work will be different when the target has been achieved and what the child can do to help, in class and independently at school and at home. Marking activity sheets and homework and giving guidance on how to improve, with the opportunity for children to comment, will help to maintain their involvement. Sharing learning objectives, inviting children to assess themselves and to set their own challenges are other strategies you can use.

All teachers recognise the value of identifying and rewarding children's achievement through a congratulatory chat, a short letter to parents, putting work on display or giving stickers, stars or badges. The support and interest of parents and carers can also help motivate children to succeed. Aim to keep them informed about the catch-up programme from the beginning and to discuss with them their child's targets and progress whenever possible. The homework tasks are designed for the child to share with others at home and involve simple activities and games that do not take very long.

MATHEMATICS TEACHING

The lessons and follow-up sessions are based on the three-part structure used in the daily mathematics lesson with which children, teachers and assistants are now familiar. They involve a substantial proportion of direct teaching. Children participate by giving answers, explaining and demonstrating their solutions to the whole group, discussing with a partner before answering, and so on. They have already experienced a variety of teaching strategies, including demonstrating and modelling by the teacher.

The plans for the lesson and follow-up session are based on the teaching strategies outlined in the introduction to the *Framework for teaching mathematics from Reception to Year 6*.

EXIT STRATEGIES

As children complete the 10-week course, you will need to think about

- identifying any further action needed to support the children with their mathematics, particularly in shape and space and measures;
- setting clear targets with each child, with time-scales for review;
- monitoring the children's progress and achievement of their targets through Year 5 and into Year 6;
- planning further brief injections of support at times when children meet new work that they find particularly difficult, as they may lack some of the essential understanding needed to cope.

SPRINGBOARD 5

FEEDBACK SHEET

Group

Week of programme

Date

Look carefully at the teaching objectives for your follow-up session.

List those children who, you feel, have now reached these objectives.

--

List those children who, you feel, are well on the way to reaching these objectives but need further consolidation.

--

List any children who, you feel, are still some way from reaching these objectives.

--

List particular successes children have had today.

--

List particular difficulties children have had today.

--

UNIT OBJECTIVES UNITS 1-3
 OBJECTIVES AND LINKS WITH THE FRAMEWORK

Unit Objectives	Linked to the Y3 teaching programme	Linked to the Y4 teaching programme	Working towards these objectives from the Y5 teaching programme
<p>1 Identify doubles and also near doubles using doubles already known</p> <p>Halve numbers where the double is known</p> <p>Understand and use £.p notation</p>	<p>Identify near doubles, using doubles already known</p> <p>Understand and use £.p notation</p>		<p>Identify near doubles, such as 1.5 and 1.6</p>
<p>2 Read, write and order whole numbers to at least 1000</p> <p>Count on and back in tens and hundreds from any two- or three-digit number</p> <p>Know what each digit represents</p>	<p>Read and write whole numbers to at least 1000 in figures and words</p> <p>Count on or back in tens or hundreds starting from any two- or three-digit number</p> <p>Know what each digit represents</p>		<p>Read and write whole numbers in figures and words, and know what each digit represents</p> <p>Recognise and extend number sequences formed by counting from any number in steps of constant size</p>
<p>3 Know by heart: all +/– facts for each number up to 20, all pairs of multiples of 100 with a total of 1000, all pairs of multiples of 5 with a total of 100, all pairs of numbers with a total of 100</p> <p>Extend understanding that subtraction is the inverse of addition</p>	<p>Know by heart: all +/– facts for each number to 20; all pairs of multiples of 100 with a total of 1000</p> <p>Derive quickly all pairs of multiples of 5 with a total of 100</p> <p>Extend understanding that subtraction is the inverse of addition</p>	<p>Derive quickly all number pairs that total 100</p>	<p>Derive quickly or continue to derive quickly: decimal pairs that total 1; all two-digit pairs that total 100; all pairs of multiples of 50 with a total of 1000</p>

Key objectives in the Framework are in bold red type. Information about how yearly teaching programmes relate to the National Curriculum levels can be found on page 42 of the Introduction to the Framework

UNIT OBJECTIVES • UNITS 4-6

Unit Objectives	Linked to the Y3 teaching programme	Linked to the Y4 teaching programme	Working towards these objectives from the Y5 teaching programme
<p>4 Recognise $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{10}$, $\frac{1}{3}$ and use them to find fractions of shapes and numbers</p> <p>Begin to recognise simple equivalent fractions, for example, $\frac{5}{10}$ as $\frac{1}{2}$ and $\frac{10}{10}$ as 1</p>	<p>Recognise unit fractions and use them to find fractions of shapes and numbers</p> <p>Begin to recognise simple fractions that are several parts of a whole</p> <p>Begin to recognise simple equivalent fractions</p> <p>Compare familiar fractions</p> <p>Estimate a simple fraction</p>	<p>Recognise simple fractions that are several parts of a whole</p> <p>Recognise the equivalence of simple fractions</p> <p>Identify two simple fractions with a total of 1</p>	<p>Use fraction notation, including mixed numbers, and the vocabulary numerator and denominator</p> <p>Change an improper fraction to a mixed number</p> <p>Recognise when two simple fractions are equivalent</p> <p>Order a set of fractions and position them on a number line</p> <p>Relate fractions to division</p>
<p>5 Use decimal notation for tenths and hundredths</p> <p>Order a set of measurements with two decimal places</p>		<p>Understand decimal notation and place value for tenths and hundredths, and use it in context</p> <p>Convert a sum of money such as £13.25 to pence, or a length such as 125 cm to metres</p>	<p>Use decimal notation for tenths and hundredths</p> <p>Round a number with one or two decimal places to the nearest integer</p> <p>Relate fractions to their decimal representations</p>
<p>6 Multiply and divide whole numbers by 10 and 100 and understand the effect</p>		<p>Multiply or divide any integer up to 1000 by 10 (whole-number answers), and understand the effect</p> <p>Begin to multiply by 100</p>	<p>Multiply and divide any positive integer up to 10 000 by 10 or 100 and understand the effect</p>

Key objectives in the Framework are in bold red type. Information about how yearly teaching programmes relate to the National Curriculum levels can be found on page 42 of the Introduction to the Framework

UNIT OBJECTIVES • UNITS 7 - 10

Unit Objectives	Linked to the Y3 teaching programme	Linked to the Y4 teaching programme	Working towards these objectives from the Y5 teaching programme
<p>7 Calculate a difference mentally by counting up from the smaller to the larger number</p>	Find a small difference by counting up from the smaller to the larger number (for example, 102 - 97)	Find a small difference by counting up (for example, 5003 - 4996)	Find differences by counting up through the next multiple of 10, 100 or 1000, eg calculate mentally a difference such as 8006 - 2993
<p>8 Develop and refine written methods for subtraction, building on mental methods. Reinforce the fact that subtraction is the inverse of addition</p>	Develop and refine written methods for subtraction, building on mental methods. Reinforce the fact that subtraction is the inverse of addition	Develop and refine written methods for column... subtraction of two whole numbers less than 1000	Extend written methods to: column... subtraction of two integers less than 10,000; subtraction of a pair of decimal fractions, both with one or both with two decimal places
<p>9 Know the three- and four-times tables Begin to know the six-times table</p>	Know the three- and four-times tables Begin to know the six-times table	Know by heart multiplication facts for two-, three-, four-, five- and ten-times tables	Know by heart all multiplication facts up to 10×10
<p>10 Develop and refine written methods for multiplication (two- or three-digit \times single-digit) Approximate the answer first</p>	Develop and refine written methods for multiplication (two- or three-digit \times single-digit) Approximate the answer first	Develop and refine written methods for $TU \times U$ Approximate first	Extend written methods to: short multiplication of HTU or U.t by U; long multiplication of TU by TU

Key objectives in the Framework are in bold red type. Information about how yearly teaching programmes relate to the National Curriculum levels can be found on page 42 of the Introduction to the Framework

Unit 1

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Identify doubles and near doubles using doubles already known eg $8 + 8$ gives $80 + 80$
- Halve numbers where the double is known
- Understand and use £.p notation

VOCABULARY

half, halve, fraction, whole, divide by 2, double, twice, multiply by 2, add

RESOURCES

digit cards or number fans; rulers; counting stick

HOMEWORK

Find a till receipt and highlight prices under 50p (at least five items). Imagine that all prices have doubled. How much will the items cost now? Now find two prices between 50p and £1. Do the same as above.

STARTER

10
MINUTES

Double and halve numbers to 10. Go through each fact from double 1 and half of 1 to double 10 and half of 10.

Do the same for multiples of 10, from double 20 and half of 20 to double 100 and half of 100, varying the vocabulary. Write these as number statements on the board. Read them aloud as a class.

KEY QUESTIONS

- Can you see any patterns, for example, $4 + 4 = 8$ and $40 + 40 = 80$?
- Can you explain these?
- Which facts do you now know – and not know?

MAIN ACTIVITY

30
MINUTES

Demonstrate that, if you know some doubles, you can easily work out several other number facts; for example, $5 + 5 = 10$ and $10 + 10 = 20$; adding these gives $15 + 15 = 30$. Similarly, $25 + 25 = 50$ and $35 + 35 = 70$. Make up similar examples.

Introduce near doubles: $15 + 15 = 30$ and so $15 + 16 = 31$. Discuss with the class the strategies used.

Demonstrate how numbers can be halved using knowledge of doubles, for example, $12 + 12 = 24$, so $\frac{1}{2}$ of $24 = 12$. The number can be split up if necessary: $\frac{1}{2}$ of 20 is 10 and $\frac{1}{2}$ of 4 is 2, giving the answer 10 plus 2, or 12.



Ask the children to give other strategies to find halves and doubles. Give the whole group numbers such as 52 to halve, showing the answer using digit cards or number fans. Ask them how they worked out the answer, and write the method on the board.

Introduce the group to marking the half-way point on a scale. Ask the children to look at their rulers and to put one finger on where it shows 10 cm. What would half-way to this point be? How many centimetres? How do they know? Try other examples. Now use a counting stick and say, for example, that one end is 0 and the other 30. What is the half-way number?

Go through the instructions for Activity sheet 1.1. As they complete it, ask individual children to explain to you how they got particular answers.

KEY QUESTIONS

- How did you find half or double of a number such as 78?
- Did anyone do it differently?
- Did anyone 'just know'?

PLENARY

10
MINUTES

Rehearse vocabulary and notation. Double 24 is? Twice 24 is? 24 multiplied by 2 is? $24 \times 2 = ?$ Halve 24. Half of 24 is? 24 divided by 2 equals? $24 \div 2 = ?$

Give some problems involving money. John spent double the 54p in his money box. How much did he spend? How do you write this? What does the zero stand for in £1.08? Stress that it is a place holder standing for no 10p coins.



SOMETHING TO REMEMBER

Double, twice and multiply by two mean the same thing.
Halving is the same as dividing by two.

Unit 1

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVES

- Identify doubles and near doubles using doubles already known eg $8 + 8$ gives $80 + 80$
- Halve numbers where the double is known
- Understand and use £.p notation

VOCABULARY

half, halve, fraction, whole, divide by 2, double, twice, multiply by 2, add

RESOURCES

Till receipt on OHT, or enlarged copies for distribution (see resource sheet); 10p and 1p coins

STARTER

10-15
MINUTES

Ask each child to choose prices, the first few under 50p and the rest in the range 50p to £1, from the till receipt used for the homework task. Write these on the board.

Revise the conventions of writing amounts greater than £1; for example, double 52p is the same as 104p or £1.04. This was briefly introduced in the lead lesson. What does the zero stand for? Remind children that this is a place holder standing for no 10p coins. Go round the group, asking children to double the prices on the board.

KEY QUESTIONS

- When doubling money, how do we write the answer in pounds and pence?
- How do you say '£1.04' and '£1.40'? What is the difference?

MAIN ACTIVITY

20-25
MINUTES

Introduce as a half-price sale. Use an OHT of a suitable till receipt or have a receipt enlarged and copied, one between two. Discuss how to deal with odd numbers of pence when halving. What do you think that the shopkeeper would do? Stress that the shopkeeper would probably round up, as there are no half-penny coins.

Demonstrate how to halve numbers by halving the tens and then the units:

$\begin{array}{r} 42 \\ 40 + 2 \\ \swarrow \quad \searrow \\ 20 + 1 = 21 \end{array}$	$\begin{array}{r} 36 \\ 30 + 6 \\ \swarrow \quad \searrow \\ 15 + 3 = 18 \end{array}$
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Working in pairs and using their till receipts, the children have to find five prices less than £1 and halve them. (The teacher may suggest that certain children can cope with prices that are more than £1. If so, try and pair these children together.) As the children work, ask each pair to talk you through the way they are setting about the task.

If there is time, introduce activity sheet 1.2. Make sure the children understand the instructions.

KEY QUESTIONS

- How do we double larger numbers?
- Which numbers are easy to halve? Which are difficult?

PLENARY**10**
MINUTES

Discuss the key questions above.

Using the board, find half of some numbers between 30 and 99. Encourage the children to break down the problem into two parts, first finding half of the tens number, and then half of the units number before adding them together. Ask the children to demonstrate the method using 10p and 1p coins; for example, 32p is three 10p coins and two 1p coins. How can we divide these between two?

Name	.....
Date	.....

Dear Parents/Carers,

In our lesson this week we have been doubling and halving numbers and talking about ways of helping us to do this.

An old till receipt is needed for this homework, one with several items under 50p. Ask your child to look at the receipt carefully and highlight or underline all prices less than 50p. Please use more than one receipt if there are only a few items. At least five items should be highlighted.

Ask your child to list all the prices under 50p on the back of this sheet, then to imagine that all the prices have been doubled and to write the new amounts alongside, as in the example below.

The next step is to find two prices between 50p and 99p and to double these, writing the figures in the same way on the back of the sheet.

Please make sure that your child brings this sheet to the next session later this week for me to check.

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

Example		
	Actual Price	Double the Price
Bread	46p	92p
Milk	29p	58p

Name

Date

Activity sheet 1.1

$\frac{1}{2}$ of 4 =

$\frac{1}{2}$ of 40 =

$\frac{1}{2}$ of 400 =

$\frac{1}{2}$ of 8 =

$\frac{1}{2}$ of 80 =

$\frac{1}{2}$ of 800 =

$\frac{1}{2}$ of 10 =

$\frac{1}{2}$ of 100 =

$\frac{1}{2}$ of 1000 =

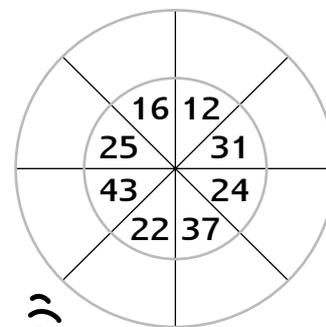
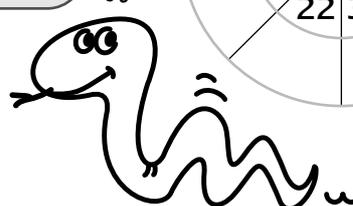
John has 26p. Mary has twice as much.
She has p.

Ann is halfway through her book. The book has 160 pages.
Ann is on page .

Double the numbers

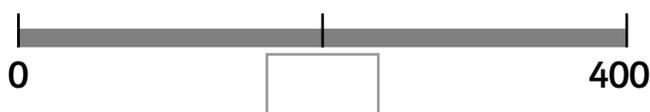
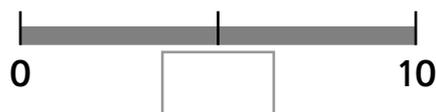
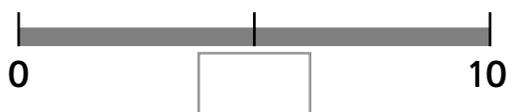
It helps to know your doubles

PSSST!



Draw a line 12 cm long in the space below. Then draw a line half as long.

What numbers come halfway on these scales?

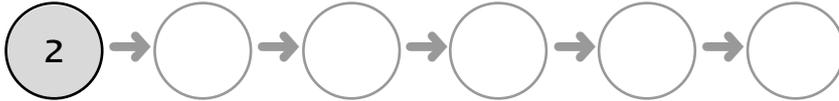
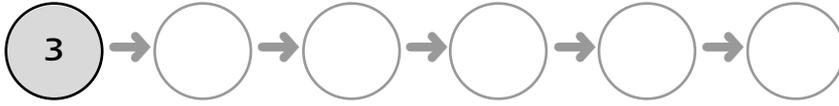


Name

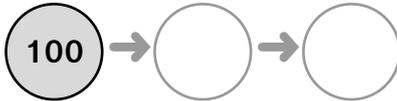
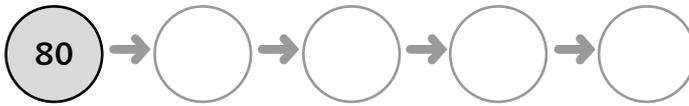
Date

Activity sheet **1.2**

Keep on doubling.



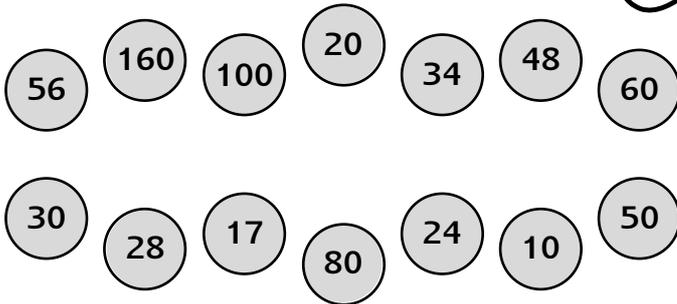
Keep on halving.



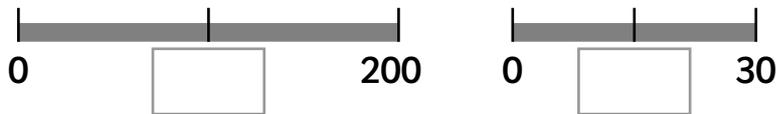
It helps to know doubles and halves



Join up numbers with their doubles.



What numbers come halfway on these scales?



What numbers go in these boxes?



Write the number that is halfway between.

300 400

700 900

16 24

35 55

Name

Date

Activity sheet 1.3

Courtney has £10 to spend. She buys three half-price things. What could they be?

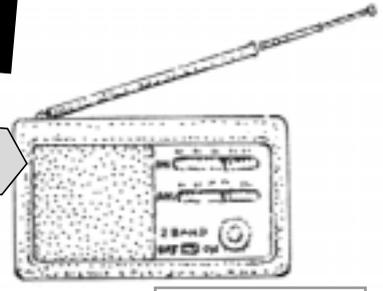
Half price sale

.....

.....

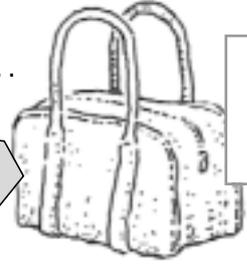
.....

£16.50



sale price
.....

£8.20



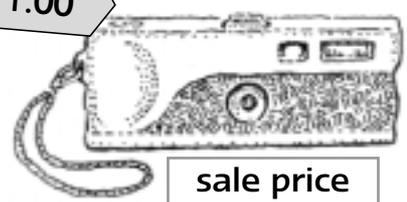
sale price
.....

£4.20



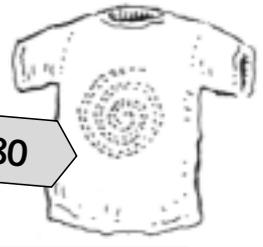
sale price
.....

£11.00



sale price
.....

£6.80



sale price
.....

Fill in the answers along the first line. What do you notice? Now fill in the other gaps with number sentences.

twice 43 = <input type="text"/>	$43 \times 2 =$ <input type="text"/>	$86 \div 2 =$ <input type="text"/>
		$18 \div 2 =$ <input type="text"/>
	$20 \times 2 =$ <input type="text"/>	
twice 53 = <input type="text"/>		

Unit 1

RESOURCE SHEET

SANDY S STORES

	£
CRISPS	0.45
PEACH	0.36
ORANGE JUICE	0.58
TISSUES 150	0.99
CHOC BAR	0.32
LETTUCE	0.27
COFFEE	1.10
CUCUMBER HALF	0.31
BUTTER	0.95
MUSHROOMS 150g	0.43
SOY SAUCE	1.36
MINI CHEESES	0.48
LAMPS 60W x2	0.77
BATTERIES x4	1.66

Unit 2

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Read, write and order whole numbers to at least 1000
- Count on and back in 10s or 100s from any 2- or 3-digit number
- Know what each digit represents

VOCABULARY

two-digit number, three-digit number, hundreds, tens and ones, counting on, counting back, before, after, place value

RESOURCES

demonstration 100 grid; place value cards; £1, 10p and 1p coins; resource sheet 2

HOMEWORK

Collect 10 three-digit car numbers. Write them down in order. Make each number 10 less. Now make each number 10 more. Read out the numbers to a friend, remembering that 247 is two hundred and forty seven and not 2-4-7.

STARTER

10
MINUTES

Display a 100 grid with all the multiples of 10 covered up. Ask the children to identify the missing numbers and to explain how they know what they are.

Write a number such as 90 on the board. Add on in tens around the class up to 220. Begin at 1000 and ask the children to count back in tens to 890. Record this on the board. Read through the numbers with the children and look for patterns.

Begin at 97 and add 10. Who can write the answer? Discuss what has happened. Continue counting in tens to 227. Beginning at 1012, count back in tens to 982. Record and read.

KEY QUESTIONS

- Which are the 100s numbers (multiples of 100)?
- How do you know?

MAIN ACTIVITY

30
MINUTES

Use place value cards to make a three-digit number such as 333. Change to 423. Which card do you use again? Why this particular one?

Write the number 342 on the board. Ask: what answer will I get if I take 40 away? Write the new number. Try with another number.

Represent a three-digit number of pence using coins. Ask the children to make the same number with their place value cards.



Display the resource sheet showing numbers from 191 to 220. Cover up all the squares save for the numbers 199, 205 and 212. Ask the children to work out the missing numbers, then to explain how they did it.

Make sure the children understand the instructions on Activity sheet 2.1. As they complete it, ask individuals to explain how they got their answers.

KEY QUESTIONS

- What is the same/different about each digit in 333?
- How do we make it bigger by 10?... and by a 100?
- How do we make it smaller by 10?... and by 100?
- When you add 100, which digit changes? Why?
- What about when you add 10?

PLENARY

10
MINUTES

Model the following activity, then ask the children to do it. Write down a three-digit number and give clues as to what it is; for example, it is 100 more than 240, or it is one less than 900. The other children have to work it out.



SOMETHING TO REMEMBER

If you add 10 to a three-digit number, the digit in the tens place (the middle column) changes.

NOTE FOR THE TEACHER

When discussing the value of digits refer to the *tens place* rather than to the tens column. Children's understanding is also enhanced when referring, for example, to the digit (not number) 4 in 643 by saying that its value is forty, rather than four tens.

Unit 2

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVES

- Read, write and order whole numbers to at least 1000
- Count on and back in 10s and 100s from any 2- or 3-digit number
- Know what each digit represents

VOCABULARY

two-digit number, three-digit number, hundreds, tens and ones, counting on, counting back, before, after, place value

RESOURCES

a large dice marked +1, -1, +10, -10, +100, -100 (this is the operator dice); place value cards; digit cards 0-9

STARTER

10
MINUTES

Discuss the homework. How do you make a number bigger by 10? How do you make it smaller by 10? Ask each child to read out his or her largest and smallest car number. Have some numbers prepared on a list for any children who have not completed the homework task, but stress the importance of doing the homework in future. Write the pair of numbers given by each child on the board and ask the others to give you a number which comes between the two.

Ask each child to choose one of the other numbers on his or her homework list and to make up a question for you; for example, my number is 100 more than 111, what is my number? Ask them to make the number with the place value cards.

KEY QUESTIONS

- Which questions were good ones to ask?
- What makes a question a good one?
- Which digits can be 0 in a three-digit number?

MAIN ACTIVITY

30
MINUTES

Choose a three-digit number, say 283. Ask a child to write it on the board and to make it with place value cards. Roll the operator dice (see resources list) and ask the children to carry out the operation to make a new number. Discuss which digit has to change. Ask a child to write the appropriate number statement on the board, for example, $283 + 100 = 383$.

Ask each child to choose three 0 to 9 digit cards to make a number. Ask each to read their number. Then, one at a time, they all come to the front with their cards and to join a line in order, starting with the child with the smallest number.



Ask each child to make the largest number possible with their digit cards. Ask them to read out their new numbers.

Make sure that children understand exactly what they have to do to complete Activity sheet 2.2. As they finish it, ask individuals to explain to you how they got their answers.

KEY QUESTIONS

- Which rule makes numbers bigger? ...and smaller?
- Which operation (on the dice) helps to make the smallest number? ...and the largest?

PLENARY

5
MINUTES

Go through the key questions above.

Ask a child to make a three-digit number with place value cards. Ask the others to make the number which is 10 (and then 100) more (and then less) with place value cards and to hold the cards up for you to see. Repeat.

Name

Date

Activity sheet 2.1

Count on in tens.

70				
390				
687				

Count back in tens.

620 - 10 ○ - 10 ○ - 10 ○ - 10 ○

82 - 10 ○ - 10 ○ - 10 ○ - 10 ○

Count back in hundreds.

700 - 100 ○ - 100 ○ - 100 ○ - 100 ○

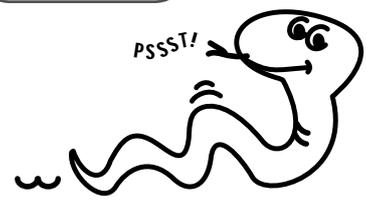
Fill in the missing numbers on these three grids.

367			
377			

97	98	
		119

240			243
	261		

Practice makes you better



Name

Date

Activity sheet **2.2**

Fill in the missing numbers on these number grids.

	324	
	344	

190			
200			

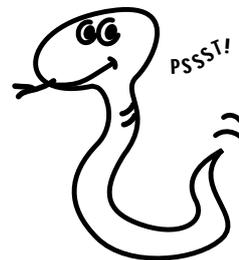
780
810

200		
210		
220		

	90	
	100	
	110	

Write down all the three-digit numbers you can make with the three cards in the space below.

Check that you've made all the numbers



.....

- Which is the biggest number?
- Which number is the smallest?
- Which numbers have the most tens?
- Which numbers have the least units?

Name

Date

Activity sheet 2.3

Carry on these patterns.

242 → 232 → ○ → ○ → ○ → ○ → ○

424 → 414 → ○ → ○ → ○ → ○ → ○

369 → 379 → ○ → ○ → ○ → ○ → ○

491 → 591 → ○ → ○ → ○ → ○ → ○

807 → 707 → ○ → ○ → ○ → ○ → ○

Complete this table.

- 100	- 10	- 1	Numbers	+ 1	+ 10	+ 100
	715		725			
248			348			
			123			
			416			
			520			
			600			
			909			

Unit 2

RESOURCE SHEET

191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220

Unit 3

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Extend understanding that subtraction is the inverse of addition
- Know by heart:
 - all addition and subtraction facts for each number up to 20;
 - all pairs of multiples of 100 with a total of 1000;
 - all pairs of multiples of 5 with a total of 100;
 - all pairs of numbers with a total of 100

VOCABULARY

multiples,
addition,
subtraction,
pairs, inverse,
total

HOMEWORK

Highlight ten items under £1 from a till receipt. Calculate the change from £1 required for each item.

RESOURCES

digit cards or number fans or petals

STARTER

10
MINUTES

Count aloud in fives to 100 and back again to zero. Rehearse addition and subtraction facts for numbers up to 10, and then for numbers up to 20. Then ask for pairs of multiples of 10 that make 100 and pairs of multiples of 100 that make 1000.

KEY QUESTIONS

- $4 + 6 = 10$, $14 + 6 = 20$, $24 + 6 = 30$. Can you see a pattern?
- Can you explain the pattern? What would come next?
- What about $4 + 6 = 10$, $40 + 60 = 100$ and $400 + 600 = 1000$? What would come next?

MAIN ACTIVITY

35
MINUTES

Do two numbers ending in 5 and 5 always make a number ending in zero when they are added together? Discuss and write examples on the board.

$5 + 5 = \square$, $25 + 5 = \square$, $125 + 5 = \square$, $355 + 305 = \square$. If you know $20 + 15$, do you know $15 + 20$?

Can you use these facts to find other facts? Can you show that the inverse is true, for example, that $35 - 15 = \square$? Try other numbers that total a multiple of 10, such as 13 and 17.

Practise adding or subtracting, using the mental recall of number facts. Children should show the answer with digit cards or number fans. Use examples such as 36 and what makes 40? 100 take away 30 is?



Make sure the children understand the instructions for Activity sheet 3.1. Encourage them to work out answers they do not know straight away by using the number facts they can remember.

**KEY QUESTIONS**

- How many facts can we write down from one statement?
- Use a statement such as $35 + 65 = 100$. What else do we know from this?

PLENARY**10**
MINUTES

Consider the key questions above.

Ask the children how you can find change from £1. Discuss their ideas and strategies ready for the homework. Emphasise the most effective and efficient methods.

**SOMETHING TO REMEMBER**

You can make three other number statements using the three numbers from any addition or subtraction statement.

Unit 3

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVES

- Know by heart:
 - all addition and subtraction facts for each number up to 20;
 - all pairs of multiples of 100 with a total of 1000;
 - all pairs of numbers with a total of 100

VOCABULARY

multiples,
addition,
subtraction,
pairs, total,
tens digit,
ones digit

RESOURCES

till receipt from
resource sheet 3

STARTER

10
MINUTES

Start by counting aloud in multiples of 20p: 20p, 40p, 60p, 80p. Then try multiples of 25p.

From their homework, ask four children to choose one item each from their till receipts. Ask the other children to work out the change from £1. Write down on the board the different methods suggested for each. Discuss with the group which are easy to get right and quick to do, and why. Use the receipt from resource sheet 3 if necessary, but stress the importance of doing the homework task.

KEY QUESTIONS

- How did you find your change?
- Has anybody used a different method?
- How do you best use counting on?
- Is it sometimes easier to take away?

MAIN ACTIVITY

25-30
MINUTES

Ask the children to record on the board pairs of numbers that total 100 where one number ends with 6. What do they notice about the pairs? For example, the ones digits are always 6 and 4, and the tens digits always total 9.

Repeat this for the pairs of numbers making 100 where one number ends with 8, then again with one number ending in 9 and once more with one number ending in 3.




KEY QUESTIONS

- How do you know that you have all the pairs?
- Could they be arranged in a way that would help you to remember them?
- Which are easy to remember? Which are hard?

Make sure that the children understand the instructions for Activity sheet 3.2. Encourage them to work out answers they do not know straight away by using the number facts they can remember.

PLENARY



5-10
MINUTES

Ask the children to suggest and write on the board some pairs of numbers with a total of 1000, including both addition and subtraction examples.

Start with a pair of numbers that total 10, for example $3 + 7$. Show how this fact can be used to work out the related facts: $30 + 70 = 100$, $300 + 700 = 1000$. Repeat with other pairs with a total of 10.

**SOMETHING TO REMEMBER**

Use what you know to work out new facts.

Name

Date

Dear Parents/Carers,

In our lesson this week we have been looking at ways to help learn addition and subtraction facts. Will you help your child to complete this homework and return it to school for the follow-up session later this week?

You will need another old till receipt, like two weeks ago. This time we need ten items under £1; please use extra till receipts to make up the number if necessary. The next step is to enter the items on the table below, and to write the change from £1 beside them.

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

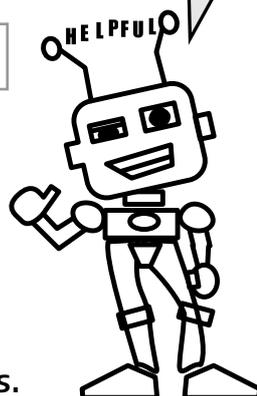
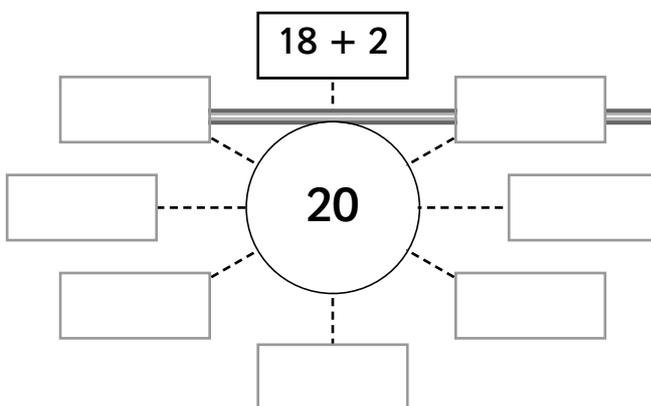
Cost of item	Change from £1
.....
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.....
.....

Name

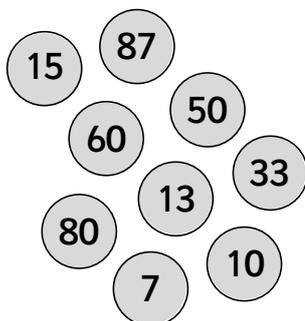
Date

Activity sheet 3.1

Fill in the boxes with other pairs of numbers that total 20.



Choose numbers to complete these number sentences. You can use a number more than once.



- = 20 20 = -

100 = 160 - 70 - = 63

100 = +

Fill in the table.

Price	3p	13p	14p	9p	7p	11p
Change from 20p						

Ring the three sweets you could buy with 20p and still get change. How much change would you get?

Name

Date

Activity sheet 3.2

Choose numbers to complete these number sentences.
You can use a number more than once.

+ = 100

+ = 30

36 + = 40

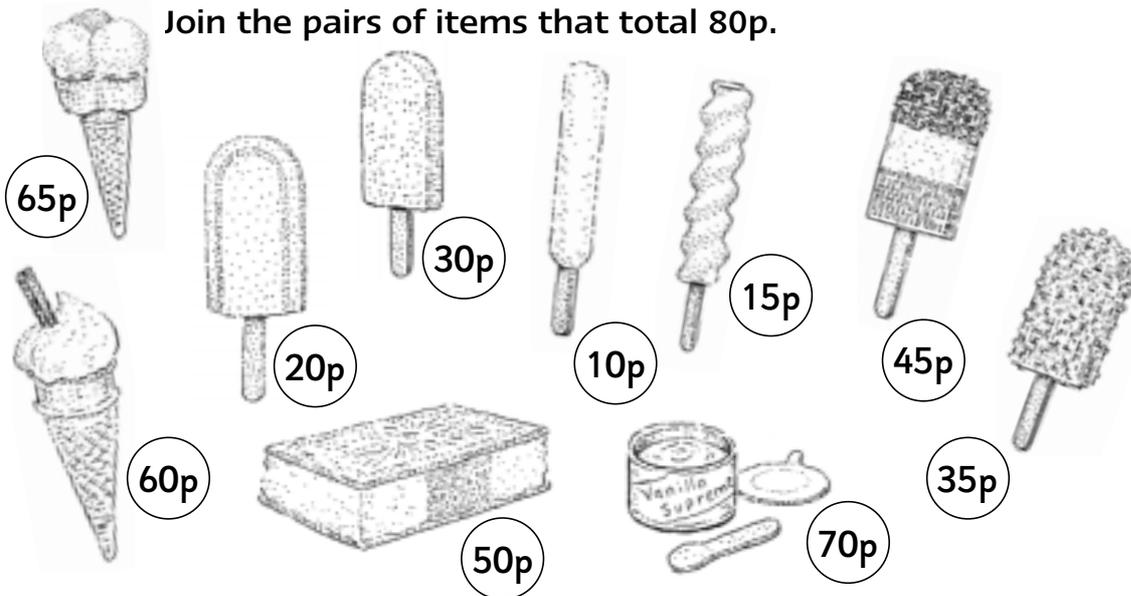
9 + = 20

50 = 35 +

60 = 8 +

- 11
- 2
- 15
- 50
- 52
- 28
- 4
- 48

Join the pairs of items that total 80p.



Write down ten different number sentences with the answer 50.

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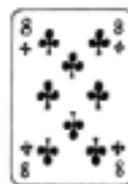
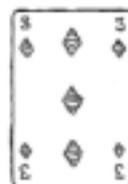
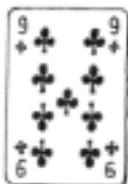
Name

Date

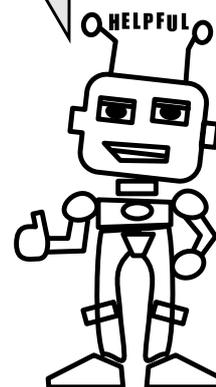
Activity sheet

3.3

Join the cards that make 10.



Learn ways of making ten.



Complete these calculations.

$27 + \diamond = 30$

$34 + \diamond = 40$

$72 + \diamond = 80$

$53 + \diamond = 60$

$28 + \diamond = 30$

$65 + \diamond = 70$

$27 + \diamond = \square$

$49 + \diamond = \square$

$81 + \diamond = \square$

Join pairs of numbers with a total of 100.

Write down five more pairs of numbers that total 100 on the back of this sheet.

80

85

24

5

65

76

20

95

15

35

Unit 3

RESOURCE SHEET

JOE S SUPERMARKET

	£
EGGS MEDIUM 6	1.25
APPLES COX 1kg	0.48
TOMATOES 500g	0.78
POTATOES BAG	1.66
ONIONS 500g	0.52
MILK SEMI-SKIM	0.26
YOGHURT x4	1.40
CHEDDAR 250g	0.96
CHICKEN FR	5.85
WHOLEMEAL LOAF	0.69
BREAD ROLLS x6	0.96
CRISPBREAD	0.51
TEABAGS 40-PACK	0.99
LEMONS x2	0.86
BANANAS x5	0.75
CORNFLAKES 500g	1.62

Unit 4

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Recognise a half, a quarter, a tenth and a fifth. Use them to find fractions of shapes and numbers
- Begin to recognise simple equivalent fractions, such as five tenths as a half and ten tenths as a whole

VOCABULARY

fractions,
half, halves,
quarter,
tenths, fifths

RESOURCES

interlocking
cubes;
counting stick;
sticky labels for
 $0, 1, \frac{1}{2}, \frac{1}{10} - \frac{9}{10}$
inclusive, $\frac{1}{5} - \frac{4}{5}$
inclusive,
10, 20
(resource
sheet 4)

HOMEWORK

See homework sheet,
which is designed to
consolidate this lesson's
work on tenths.

STARTER

10
MINUTES

Ask the children to work in pairs to make a stick out of eight interlocking cubes. One quarter of the stick should be red and the rest yellow. Ask them to hold up the stick of cubes for you to see. What fraction of the stick of cubes is yellow?

Now ask them to make a stick with 12 cubes. They are to make one half of the stick red and hold it up. Then they do the same for three quarters of the stick. How many halves make a whole? How many quarters make a whole? How many quarters do you need to put with one half to make a whole one?

KEY QUESTION

- **Make a shape using 16 cubes in which one quarter of the shape is blue, one quarter yellow and the rest red. What fraction of the whole is red?**

MAIN ACTIVITY

35
MINUTES

Ask the children to make a shape using only 10 cubes. How many cubes in one tenth of the shape? How many in three tenths of the shape? How many cubes are left? What fraction of the shape is this? How many cubes in one half of the shape? How many tenths in one half?

Tell the children to make a different shape with ten cubes but this time changing the colour after every two cubes. What fraction of the whole is two cubes? How many groups of two cubes are there in the shape? Point out that the shape can be split into five equal parts, and that each part is a fifth. How many tenths in one fifth?



Show the children the counting stick. How many sections does it have? What fraction of the whole stick is one of these sections? What fraction is two sections? What is another way of saying this? Now put a label for zero at one end of the stick and a label for one whole one on the other end. Where does the label for one half belong? Ask a child to put it on the stick. Ask others to place the rest of the labels on the stick.

Explain that the counting stick now runs from zero to ten. Put the new labels on each end. Where does the label for one half go? What number is this? Where does the label for one fifth go? What number is there? Where should the label for one tenth go? What number is there?

Make sure all the children understand the instructions on Activity sheet 4.1.

**KEY QUESTIONS**

- How do you find one tenth of something?
- How many tenths are in a whole one?
- How many tenths are the same as one fifth?
- How many fifths in a whole one?

PLENARY**5**
MINUTES

Discuss the key questions above. Ask the children to imagine a cake cut into five equal slices. What fraction of the whole cake is each slice? How much is left if one slice is taken away? Now imagine a cake cut into 10 equal slices. If three children each take a slice, what fraction of the cake is left?

Explain the homework, making sure that all the children understand the instructions.

**SOMETHING TO REMEMBER**

The fraction taken from a shape and the fraction remaining make a whole.

Unit 4

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVES

- Recognise a half, a quarter, a tenth and a fifth. Use them to find fractions of shapes and numbers
- Begin to recognise simple equivalent fractions, such as five tenths as a half and ten tenths as a whole

VOCABULARY

fractions, half, halves, quarters, tenths, fifths

RESOURCES

interlocking cubes; counting stick; sticky labels for zero and 20

STARTER

10
MINUTES

Go over the homework with the children demonstrating the activity with the different coloured cars on the board, drawing crosses instead of cars to save time.

Remind the children about the shapes they made with cubes in the lead lesson. Thinking about these may help them to answer your next questions. Ask the questions one at a time, asking children to hold up digit cards to show each answer. What is one half of 8? ...of 12? ...of 16? What is one quarter of each of these numbers?

KEY QUESTIONS

- What is one half of 8?
- What is one quarter of 8?
- What is three quarters of 8?

MAIN ACTIVITY

25-30
MINUTES

Group the children in pairs and give each pair an assortment of interlocking cubes. They are to fit together 20 cubes into a shape: half of the shape should be red, one tenth blue, two tenths yellow and one fifth green. Ask the pairs to hold up their shapes so that you can check them. Two colours have the same number of cubes. Which ones? What fraction of the whole shape is each of these colours? What do you know about these fractions?

Explain the instructions for Activity sheet 4.2




KEY QUESTIONS

- How many of the 20 cubes are red? ...blue? ...yellow? ...green?
- What fraction of the whole shape does each colour stand for? How do you know?
- What fraction of the original shape is left if we take away all the red cubes?

PLENARY


5-10
MINUTES

Show the counting stick with labels for zero at one end and for 20 at the other. Where is one half? Where is one tenth? Where is two tenths? What is another way of saying two tenths?

Name

Date

Dear Parents and Carers,

This week we have been working very hard with our fractions. Would you please help your child complete this worksheet before our follow-up lesson later in the week.

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

Cars in a car park

Mark $\frac{1}{10}$ of the cars in blue.



Mark $\frac{5}{10}$ of the cars in red.



Mark $\frac{2}{10}$ of the cars in green.



What fraction of the cars in the park has not been marked?



.....



What fraction is the same as $\frac{5}{10}$?

What fraction is the same as $\frac{2}{10}$?

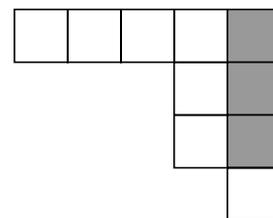
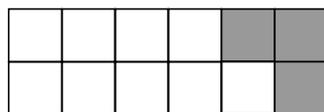
What is $\frac{10}{10}$?

Name

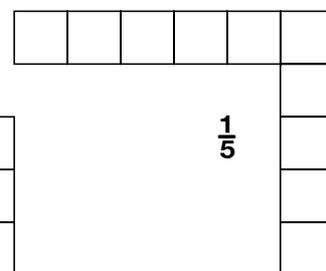
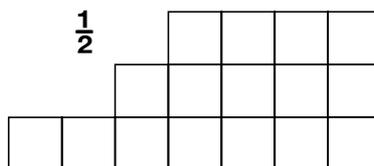
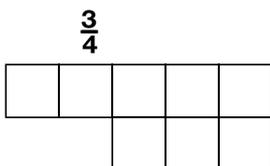
Date

Activity sheet 4.1

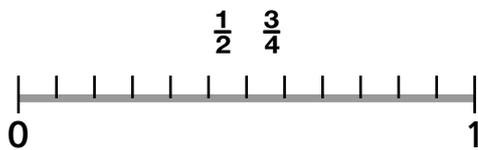
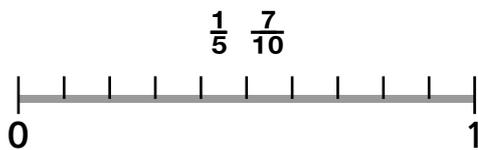
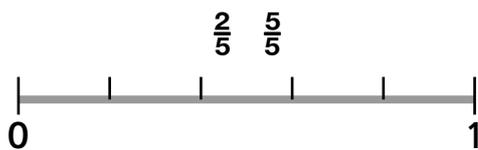
What fraction of these shapes is shaded?



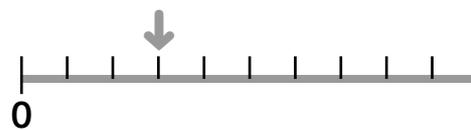
Shade in the fraction given of each of these shapes.



Draw an arrow from the fractions to their place on the number line.



Write the fraction shown by the arrow on each of these number lines.



12 children walk to school.

$\frac{1}{4}$ have book bags. How many is this?

$\frac{3}{4}$ have sandwich boxes. How many is this?

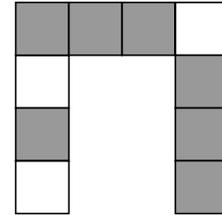
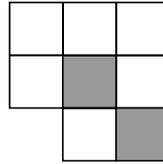
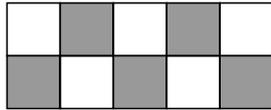
$\frac{1}{2}$ are wearing coats. How many is this?

Name

Date

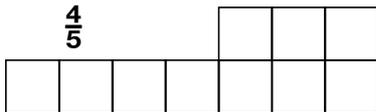
Activity sheet 4.2

What fraction of these shapes is shaded?

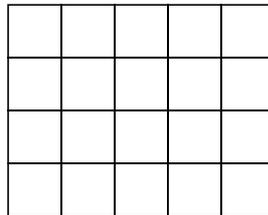


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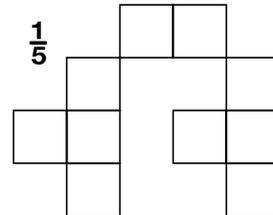
Shade in this fraction of each shape.



$\frac{3}{10}$



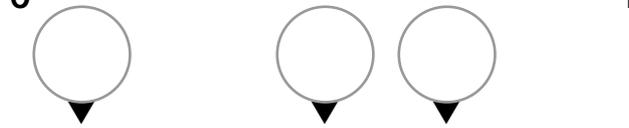
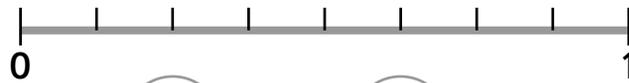
$\frac{1}{5}$



Put these fractions in the right places on this line.

$\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$

Write the fraction the arrow is pointing to in the circles.

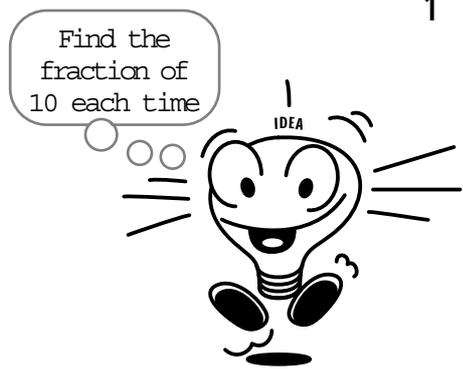


There are 10 pets in the pet shop.

$\frac{1}{2}$ are puppies.
How many puppies are there?

$\frac{1}{5}$ are kittens.
How many kittens are there?

$\frac{3}{10}$ are canaries.
How many canaries are there?

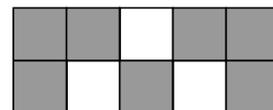
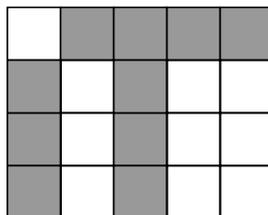
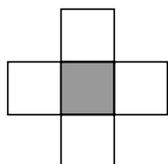


Name

Date

Activity sheet 4.3

What fraction of these shapes is shaded?



.....

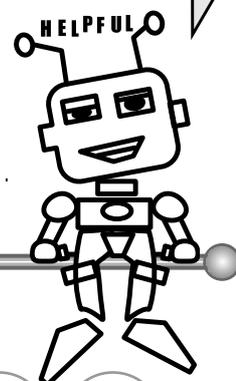
Matt has 12 stickers. He gives three quarters of them away.
How many does he give away?

Sam makes 15 sweets and eats four fifths of them. How many does she eat?

Amina has a packet of 20 biscuits. She puts three tenths of them on a plate.
How many does she put on the plate?

Robert has 16 marbles. He puts three eighths of them in his pocket for a game.
How many does he put in his pocket?

For these problems, think about how many items there are to start with.



Write in the equivalent fractions

$\frac{1}{10}$	$\frac{2}{10}$	$\frac{\quad}{10}$							
0	▼	▼	▼	▼	▼	▼	▼	▼	1
$\frac{1}{10}$	$\frac{1}{5}$	$\frac{\quad}{10}$							
$\frac{10}{10}$	$\frac{5}{10}$	$\frac{\quad}{10}$							

Unit 4
RESOURCE SHEET

UNIT
4

0	1	$\frac{1}{2}$	$\frac{1}{5}$
$\frac{2}{5}$	$\frac{3}{5}$	$\frac{4}{5}$	$\frac{1}{10}$
$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$
$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$
10		20	

Unit 5

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Use decimal notation for tenths and hundredths
- Order a set of measurements with two decimal places

VOCABULARY

tenth,
hundredth,
whole number,
decimal,
fraction,
larger, smaller,
less than,
more than,
equal to

RESOURCES

counting stick;
large, blank
100 grid; large
square divided into
ten equal rows;
decimal place value
cards (see resource
sheet);
coins (£1, 10p, 1p);
metre rule

HOMEWORK

Look in old newspapers and shopping catalogues to find five items that cost between £1 and £10 and three that cost less than £1. Write each price in both the decimal form and pence.

STARTER

10
MINUTES

Show the counting stick. How many equal parts? What is each part called (a tenth)? Count along and back down the stick in tenths. Get a child to show three tenths on the stick. How many tenths from three tenths to one whole one? Where is one half? How many tenths are the same as one half?

Show a large, blank square divided into ten equal rows. Ask a child to show one tenth (one row) and five tenths (five rows). What is another way of saying this? Now display a blank 100 grid the same size as the first square. How many rows and how many small squares in each row? How many small squares altogether? Emphasise ten out of a hundred squares. How many in one half or five tenths?

KEY QUESTIONS

- What is one tenth of a hundred?
- What is three tenths of a hundred?
- What is one half - or five tenths - of a hundred?

MAIN ACTIVITY

35
MINUTES

Use decimal place value cards to make the number 3.46. Where do you see numbers like these? Make the link with money. Write the number with a £-sign on the board. Match the number to coins: three £1 coins, four 10p coins and six 1p coins. Stress that 10p is one tenth of a pound as 10 of them make one pound. Similarly, point out that 1p is one hundredth of a pound as 100 of the coins make £1.

Compare the place value cards (tenths and hundredths) and the coins. Make sure that all the children know that the decimal point separates the ones from the tenths, the whole number from the fraction.



Split the group into pairs. Each child has to make a decimal number with the place value cards and then with the coins. The pair must then decide which number is the larger and which is the smaller.

Copy an example from the children's work onto the board, using both formats: place value cards and coins. What does each digit represent? Establish that a figure of, say, £4.32 is made up of four £1 coins, three 10p coins and two 1p coins, or four whole pounds, three tenths of a pound and two hundredths of a pound.

Explain that you are going to take one tenth of a pound and one hundredth of a pound. Point to a 10p coin and 1p coin from the example on the board. How many pennies are the same value as one 10p coin? How many hundredths are the same as a tenth? Ask similar questions about three 10p coins, or three tenths of a pound.

Introduce the children to Activity sheet 5.1. Make sure that they all understand the instructions.

KEY QUESTIONS

- Which digit represents the tenths?
- Which digit represents the hundredths?
- Which digit is the whole number?
- Which digit is worth most? Which digit is worth the least?

PLENARY



Demonstrate that a metre rule has 100 centimetres. Explain that a length expressed in metres and centimetres can be written like pounds and pence with a decimal point. Give a length in metres; say, the board is 2.25 metres long. Discuss which digit is metres, which is tenths of metres and which is hundredths of metres.



SOMETHING TO REMEMBER

The decimal point always separates the whole ones from the tenths.

Unit 5

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVES

- Use decimal notation for tenths and hundredths
- Order a set of measurements with two decimal places

VOCABULARY

tenth,
hundredth,
whole number,
decimal, larger,
smaller, less
than, more
than, equal to,
decimal place

RESOURCES

decimal place
value cards;
three 1–6 dice

STARTER

5-10
MINUTES

Write a three-digit number on the board. Ask a child to add 1 to it. Ask another to add 10 to the new number and yet another to add 100. Now subtract these amounts from the starter number. Which digit do you change to add or subtract the number by 100? ... by 10? ... by 1?

Play the following game as a group. Write a three-digit number on the board. The first child adds 1, the second adds 10 to the new number and the third adds 100. Repeat for subtracting 1, 10, or 100. Now choose a new number.

KEY QUESTION

- Can you say a three-digit number and then give the numbers you get if you add 1, add 10 and add 100?

MAIN ACTIVITY

30-35
MINUTES

Ask the children to select five amounts above £1 and three under £1 from their homework, either in the decimal form or in pence. Write them on the board. Which is the smallest amount of money? Which is the largest? Organise the children to work in pairs to write the amounts in order, starting with the largest.

Remind the children that a 10p coin is the same as one tenth of a pound and a 1p coin is the same as a hundredth of a pound. What is 0.8 of a pound in pence (80p)? What is 0.2 of a pound in pence (20p)? What is 60p expressed as a decimal of a pound (0.6)? What is 0.02 of a pound in pence (2p)? What is 6p expressed as a decimal of a pound (0.06)?



Write on the board six lengths less than 10 metres, such as 7.35 m or 2.06 m. Make sure the children know which digit represents the tenths and which the hundredths. Point out that the tenths and hundredths represent the centimetres. Tell them to use the decimal place value cards to help them as they write the measurements in order of size, starting with the longest.

Introduce Activity sheet 5.2. Make sure that everybody understands the instructions.

KEY QUESTIONS

- Which digit is most important if we are trying to order decimal numbers to two places?
- Which is next most important?
- Which is least important?

PLENARY

5
MINUTES

Discuss the key questions above.

Roll three dice. Ask the children to make the smallest possible number with two decimal places using each of the three digits once. Write their attempts on the board with the decimal point. Now ask them to make the number with two decimal places that is nearest to 5 that they can. Whose is nearest? Play again.

UNIT 5

Name

Date

Dear Parents/Carers,

In our lesson this week we have been learning about decimals. Will you help your child complete this homework in time for the follow-up lesson later this week?

What your child has to do is to look in newspapers or shopping catalogues to find five items costing between £1 and £10 and three items costing less than £1. Your child should then fill in the grid below, expressing the cost in the decimal form and in pence, as in the examples.

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

	Item	Cost in £.p	Cost in pence
Items costing £1-10	(example) CD	£ 8.49	849p

Items costing under £1	(example) Tin of beans	£ 0.43	43p

Name

Date

Activity sheet 5.1

Put these amounts of money into order from the smallest to the largest.

£2.26, £1.85, £2.90, £1.35

--	--	--	--

£1.04, £0.40, £1.01, £1.40

--	--	--	--

£3.79, £5.22, £1.38, £2.16

--	--	--	--

£4.79, £4.71, £47.90, £0.47

--	--	--	--

£6.56, £65.56, £6.30, £56.98

--	--	--	--

£5.55, £55.55, £6.50, £6.66

--	--	--	--



To find the largest amount, look at the digit on the left first

Write the value of the underlined digit in tens, units, tenths or hundredths as in the example.

0.05 5 hundredths 0.04 0.17

0.62 0.69 1.24

13.62 8.88 19.01

Name

Date

Activity sheet 5.2

Choose numbers from the box on the right to complete the number sentences below. Use each number only once, and tick it off when you use it.

More than
>

Less than
<

>

>

>

>

<

<

<

<

To find the largest number, look at the digit on the left first



Now you choose two digits. Using these and zero, make as many numbers as you can. They must all have a decimal point. Write them on the back of this sheet.

Put the first five of your numbers in order, starting with the smallest.

Name

Date

Activity sheet

5.3

Practice makes you better!



Ring the numbers below that are between 7 and 8.

- 5.21 7.71 6.3 7.12 8.02

Ring the numbers below that are between 50 and 60.

- 46.21 52.02 61.2 60.02 59.15

Put these lengths in order from the shortest to the longest.

6.4 m 3.2 m 4.6 m 8.9 m 5.1 m

5.12 m 5.21 m 6.21 m 6.12 m 4.91 m

26.3 m 263 m 2.63 m 0.26 m 3.0 m

Write in three lengths between 1.18 m and 2.18 m.

.....

Unit 5

RESOURCE SHEET

UNIT

5

1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

Unit 6

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVE

- Multiply and divide whole numbers by 10 and 100 and understand the effect

VOCABULARY

digit, decimal point, multiply, times, divide, how many ... in? thousands, hundreds, tens, ones, tenths, hundredths zero

RESOURCES

digit cards; place value cards (see resource sheet)

HOMEWORK

Find out how much change two adults in your house have in their purses or pockets. Write down the amount. How much would they have if they multiplied that amount by 10?...by 100?

STARTER

10
MINUTES

Give out three digit cards and a card with a decimal point on it to each child. Children are to make the biggest number with two decimal places they can. Ask them to read aloud their numbers. Ask them to form a line at the front so that the numbers they have made are in sequence, starting with the largest.

They are now to make the smallest number they can with two decimal places using the cards they already have. Which digits stayed the same? Which digits needed to be changed?

KEY QUESTIONS

- Where should the biggest digit go to make the biggest number?
- Where should the biggest digit go to make the smallest number?

MAIN ACTIVITY

30-35
MINUTES

Ask the group to chant the 10 times-table. Write $36 \times 10 = \square$ on the board. What do you think the answer is going to be? How did you work this out? Demonstrate on the board, using hundreds, tens and units boxes, how the digits move to the left. Write in 36 and then 360. Repeat for other two-digit numbers multiplied by 10.

Ask the group to chant the 100 times-table. Can they go through to 20×100 ? Write $36 \times 100 = \square$ on the board. What do you think the answer is going to be? How did you work this out? Repeat for other two-digit numbers multiplied by 100.

Write $\square \times 100 = 500$ on the board. Ask the group to read this aloud. How many hundreds make five hundred? Remind the children that another way of writing this number statement is $500 \div 100 = \square$.



In pairs, ask the children to make 300 with their place value cards. Ask them to divide this number by 10, holding up the place value cards that give the answer. Give them numbers that are a multiple of 100, and get them to divide these either by 10 or by 100. Extend to numbers such as 5000.

Introduce the children to Activity sheet 6.1. Make sure that they understand the instructions.

**KEY QUESTIONS**

- What happens when we multiply a number by 10?
- What happens when we multiply a number by 100?
- What happens when we divide a number by 10?
- What happens when we divide a number by 100?

PLENARY**5-10**
MINUTES

Consider the key questions above. Now show the children a 50p coin. How much would ten of these be worth? Establish that they would have 500p or £5. If they had 53p, how much would they have if they multiplied this amount by 10? What if they multiplied it by 100? Illustrate with place value cards.

**SOMETHING TO REMEMBER**

Multiplying by 10 moves a digit one place to the left; dividing by 10 moves a digit one place to the right.

Unit 6

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVE

- Multiply and divide whole numbers by 10 and 100 and understand the effect

VOCABULARY

multiply, times, divide, how many ... in? thousands, hundreds, tens, ones, tenths, hundredths

RESOURCES

cards with numbers in the range 10–20; coins £1, 10p, 1p; place value cards; cards with numbers with two decimal places

STARTER

5-10
MINUTES

Ask the children to multiply one-digit and two-digit numbers by 10 and 100.

Play Bingo. Each child writes down five multiples of 10 between 100 and 200 inclusive, such as 120 or 180. Use cards with the number range 10–20, shuffled and face down. Turn over one at a time. Say: multiply this number by ten. Any child with the answer crosses it out. The first child to cross out all five numbers shouts 'Bingo!' Check results with the class.

KEY QUESTIONS

- What happens when we multiply a number by 10?
- What happens when we multiply a number by 100?

MAIN ACTIVITY

25-30
MINUTES

Ask a child to tell you the amount of change they wrote down for their homework. How do we multiply amounts of money by 10 and 100? Demonstrate by using coins, concentrating on each digit separately. For £3.67, say, show that £3 multiplied by 10 is £30, that 60p multiplied by 10 is £6 and that 7p multiplied by 10 is 70p. Add the totals together, and ask the children to demonstrate what has happened to each digit using place value cards.

Repeat, showing children how they can multiply an amount by 100.

In pairs, ask the children to multiply three more amounts you put on the board by 10 and 100, and to use coins and the place value cards to demonstrate each.

Introduce Activity sheet 6.2, and make sure that all the children understand the instructions.




KEY QUESTIONS

- What happens to each digit in an amount of money when we multiply it by 10?
- What happens to each digit when we multiply it by 100?

PLENARY


10
MINUTES

Consider the key questions above. Give out place value cards to each child and a number with two decimal places on a card. The children multiply their number by either 10 or 100 and write down the answer. In turn, the children show their answers. The others must say whether they multiplied by 10 or 100.

Name	.....
Date	.....

Dear Parents and Carers,

In our lesson this week we have been learning about dividing and multiplying numbers. Will you help your child to complete this homework and return it to school for the follow-up session later this week?

What your child has to do is ask two people in your house how much loose change they have in their purse or their pocket, and help them count it out.

The next step is to multiply each of the amounts by ten, and then by 100, and write the results in the spaces provided below.

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

	Amount £	× 10 £	× 100 £
First person
Second person

Name

Date

Activity sheet 6.1

Multiply these numbers by 10.
Then do the other exercises.

x 100

45
7
80
61

÷ 10

860
40
630
120

Look at these patterns

- $1 \times 1 = 1$
- $1 \times 10 = 10$
- $1 \times 100 = 100$
- $600 \div 1 = 600$
- $600 \div 10 = 60$
- $600 \div 100 = 6$

÷ 100

600
300
800
900

Carry on these patterns in the same way.

$9 \times 1 = \dots\dots\dots$ $62 \times 1 = \dots\dots\dots$ $700 \div 1 = \dots\dots\dots$ $900 \div 1 = \dots\dots\dots$

.....

.....

Name

Date

Activity sheet **6.2**

As you move down the table below, the amounts of money are multiplied by 10. As you move up, the amounts are divided by ten. Fill in the gaps.

£0.01	£0.02	.....	.....	.....	£0.06	.....	.....	£0.09
£0.10	.....	£0.30	.....	£0.50	.....	.....	£0.80	.....
£1	£2	£3	£4	.....	£6	£7	.....	£9
£10	.....	.....	£40	£50	.....	£70	£80	.....
.....	£200	£300	.....	£500	.....	.....	.....	.....

Now fill in the gaps on this chart in the same way.

Multiply by 10 ↓ ↓	£2.50	£3.25	↑ ↑ Divide by 10
	.....	£37	.....	.....	£86
	.....	.....	£180	.....	.....

Name

Date

Activity sheet **6.3**

Multiplication.
Fill in the boxes.

$\square \times 100 = 500$

$8 \times 100 = \square$

$7 \times \square = 70$

$4 \times \square = 400$

$\square \times 100 = 900$

$\square \times 100 = 3000$

$60 \times \square = 600$

$20 \times \square = 2000$

Division.
Fill in the boxes.

$40 \div 10 = \square$

$\square \div 10 = 62$

$\square \div 100 = 2600$

$8200 \div \square = 82$

$3210 \div \square = 321$

$\square \div 10 = 1$

When you multiply by 10 or 100,

move the digits to the left



When you divide by 10 or 100,

move the digits to the right

How many times larger than 87 is 870?

10 tins of dog food cost £4.50. One tin costs

How many 10p coins in £15?

How many 10p coins in £150?

Unit 6

RESOURCE SHEET

UNIT

6

1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	9	6
7	7	7
8	8	8
9	6	9

Unit 7

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVE

- Calculate a difference mentally by counting up from the smaller to the larger number

VOCABULARY

next ten,
multiple of ten,
how much
more?
count on,
difference,
subtract,
nearest

RESOURCES

large cards for
the numbers
47 and 54
(see resource
sheet);
digit cards

HOMEWORK

Create two two-digit numbers, any two you like, and work out the difference in your head. Write the subtraction statement, for example, $63 - 39 = 24$. Do this three more times.

STARTER

10
MINUTES

Revise addition and subtraction facts for numbers up to 20, such as $7 + 9 = 16$ and $15 - 8 = 7$. Adopt a brisk pace. Use these facts to help calculate with larger numbers, such as $37 + 9 = 46$, $75 - 8 = 67$.

Revise going up to the 'next ten'. Suggest a number, say 46. What is the next ten (50)? How many do we add? Repeat for three or four two-digit numbers.

KEY QUESTIONS

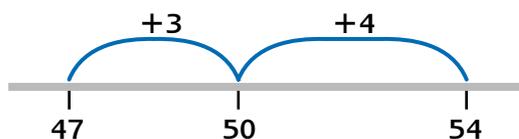
- Which are the 'no work' subtractions? For example, $43 - 3$, $54 - 4$.
- How many to the next multiple of 10? For example, from 43 to the next multiple of 10 is 7.

MAIN ACTIVITY

30-35
MINUTES

Give a card with 47 on it to one child and another with 54 on it to a second child. They hold up their cards. Point at the 54 card. How much more is this than 47? Draw a blank number line on the board. Choose a child to place 47 on the line. How many more to 50? How many more to 54?

Demonstrate counting on along the line: three to 50, then four more to 54. How much more is 54 than 47? What is the difference between 54 and 47? Write $54 - 47 = 7$.



Repeat this process for another pair of numbers between 20 and 100. Extend to amounts over 100 by asking how much more is 172 than 165? Use a blank number line to demonstrate. Ask the children to suggest the most helpful numbers to put in. End by including examples such as $4005 - 3998$. Ask the children to demonstrate on the board.

Introduce Activity sheet 7.1. Make sure that everybody understands the instructions.

**KEY QUESTIONS**

- How many to the next multiple of 10?
- How many to the number you need?
- How many altogether?

PLENARY**5-10**
MINUTES

Ask the children to work out $63 - 57$. Can they picture the number line in their heads? What multiple of 10 can they see on it? What other numbers are there? What is the answer? Ask different children to work out in their heads the following, holding up their answers on digit cards: $76 - 58$, $137 - 124$, $158 - 27$, $1002 - 995$. Ask for explanations.

**SOMETHING TO REMEMBER**

It sometimes helps to go up in two steps when adding on.
Go up to the nearest multiple of 10 first.

Unit 7

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVE

- Calculate a difference mentally by counting on from the smaller to the larger number

VOCABULARY

next ten,
multiple of ten,
how much
more?
count on,
difference,
subtract

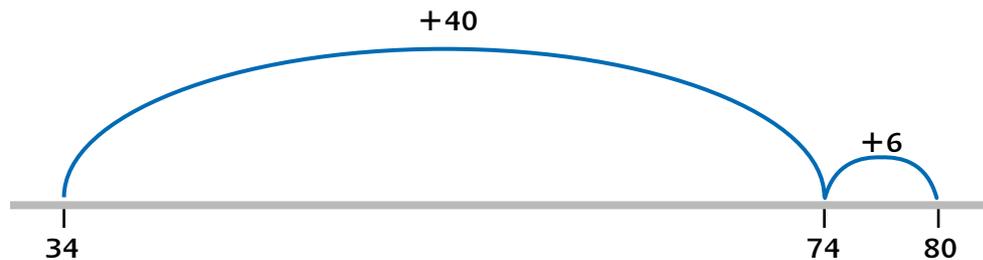
RESOURCES

digit cards;
£1, 10p and 1p coins

STARTER

5-10
MINUTES

Practise counting in tens, and then counting up to the next multiple of 10; for example, count in tens from 34 to 74. Ask the children to chant. How many more to 80? Demonstrate on the board using a blank number line:



Do two more examples. See if the children can manage these without the number line, but draw one if they are experiencing difficulty.

KEY QUESTIONS

- What is 80 subtract 34?
- How much more is 80 than 34?
- What is the difference between 34 and 80?

MAIN ACTIVITY

25-30
MINUTES

Choose a subtraction statement such as $54 - 36$ to demonstrate how to find a difference, using jottings to help. Say: start at 36 and count to the next multiple of 10. That's 4, and takes us to 40. Jot down 4. 40 to 54 is 14. Jot down 14. Add 4 and 14 to get 18. Ask a child to come to the front to demonstrate this using a number line, as in the earlier lesson.



Take another example from a child's homework and work out the answer using jottings, but not the number line. In pairs, the children are to check each other's homework using jottings rather than a number line. Children who did not manage to do the homework can practise the jottings method using two-digit numbers they choose themselves, but stress the importance of doing the homework in future.

Demonstrate the jottings method using three-digit numbers, for example, $342 - 225$. Start at 225 and count to the next multiple of 10. That's 5 and takes us to 230. Jot down 5. 230 to 242 is 12. Jot it down. 242 to 342 is 100. 100 and 12 is 112 and 5 more brings us to 117. Do another example in the same way.

Introduce Activity sheet 7.2, and make sure that everybody understands the instructions.

KEY QUESTIONS

- How many to the next multiple of 10?
- What is the next multiple of 10?
- How many more do we have to count up to reach the larger number?
- What is the total difference?

PLENARY

10
MINUTES

Go through the key questions above. Make sure all the children know how to tackle them. Remind everybody that earlier on they did the example $342 - 225$ together. Say: supposing this had been $\text{£}3.42 - \text{£}2.25$. Write both subtraction sentences on the board. How do the two differ? What would you have to do differently when working out the second example?

Demonstrate the calculation on the board, encouraging the children to explain clearly each step as you carry it out. Now ask the children, in pairs, to demonstrate the same subtraction by using coins.

Name

Date

Dear Parents and Carers,

In our lesson this week we have been learning about ways of finding differences between numbers. Will you help your child to complete the homework task below and make sure it is returned to school for the follow-up session later this week?

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

Choose two two-digit numbers, any two you like.

Work out the difference in your head, then write out the subtraction statement in the space below, for example, $57 - 34 = 23$.

Do this three more times.

.....

.....

.....

.....

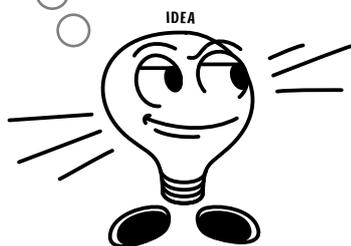
Name

Date

Activity sheet

7.1

Start at the smaller number and count up.



Find the difference by counting on.

$44 - 37 = \square$

$42 - 38 = \square$

$63 - 59 = \square$

37
count on 3
40 count on
4 44. Add 3
and 4
7 altogether.

$72 - 65 = \square$

$93 - 86 = \square$

$102 - 98 = \square$

$84 - 79 = \square$

$91 - 88 = \square$

$104 - 97 = \square$

Now choose your own two-digit numbers to make up four similar questions.

$\square - \square = \square$

Write the number sentences and their answers here.

Find the difference by counting on.

$151 - 146 = \square$

$172 - 165 = \square$

$164 - 159 = \square$

$163 - 158 = \square$

$154 - 145 = \square$

$173 - 167 = \square$

Name

Date

Activity sheet 7.2

Find the difference by counting on.

$692 - 545 = \square$ $816 - 797 = \square$ $924 - 799 = \square$
 $321 - 267 = \square$ $433 - 312 = \square$ $211 - 158 = \square$

Start at the smaller number and count up.

545 add
5 550 add
50 600 add
92 692.

Add
 $5 + 50 + 92 = 147.$

Take three digit cards. Make sure that you don't pick up a zero. Arrange them to make the largest number possible. Write this down.

$\square - \square = \square$

Now swap the last two digits round. If, for example, you have the digits 8, 2 and 9, you should make the numbers 982 and 928. Work out the difference between the two numbers.

$\square - \square = \square$

Make up four more number sentences, using different sets of three digits in the same way. Fill in the boxes.

$\square - \square = \square$

$\square - \square = \square$

$\square - \square = \square$

Name

Date

Activity
sheet

7.3

Decide whether you need to add or subtract. Use the space below or at the side for your jottings.

What is the difference between these numbers?

682

629

What number is 150 more than 237?

Take 257 from 785.

There are 87 people already in the museum.

The 32 pupils from Class 2 join them.

How many are now looking round?

What needs to be added to 374 to make 502?

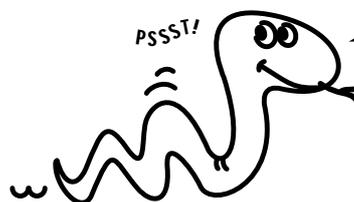
How many more is 614 than 485?

Increase 956 by 250.

What is the difference between these numbers?

8010

7981



Don't forget to count up from the smaller number!

Unit 7

RESOURCE SHEET

47

54

Unit 8

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Develop and refine written methods for subtraction, building on mental methods
- Reinforce the fact that subtraction is the inverse of addition

VOCABULARY

hundreds, tens and ones (units), take away, subtract, counting on, difference, column, digit, jotting

RESOURCES

Digit cards 0–9 inclusive

HOMEWORK

Write down a three-digit number, reverse the digits and subtract the smaller number from the larger, and check by adding back. Now do four more. (You may wish to send parents a worked example.)

STARTER

10
MINUTES

Revise addition and subtraction facts for numbers up to 20, such as $7 + 9 = 16$ and $15 - 8 = 7$. Adopt a brisk pace. Use these facts to help calculate with larger numbers.

Ask the children to think about the counting on methods they used last week, and to work out in their heads such examples as: $86 - 72$, $66 - 36$, $96 - 79$, $367 - 258$. They can make jottings or draw a number line. Ask them to explain how they worked out each calculation.

KEY QUESTIONS

- What is the next multiple of 10?
- How many more to the next multiple of 10?
- How many more to the larger number?

MAIN ACTIVITY

30-35
MINUTES

Point out that the numbers in a subtraction calculation are sometimes awkward and difficult to do just by jotting down the odd figure, even if the children draw a number line to help. They may well have seen calculations set out vertically. Write $784 - 159$ vertically.

Find out whether and how they could tackle this. If they already have a method they can use accurately and reasonably quickly, reinforce this by getting a pair to come to the board to demonstrate. If there is no clearly established approach you could introduce the counting up (complementary addition) method outlined on pages 51–52 of part 6 of the *Framework for teaching mathematics*.

$$\begin{array}{r}
 784 \\
 -159 \\
 \hline
 1 \quad (\text{to make } 160) \\
 40 \quad (\text{to make } 200) \\
 500 \quad (\text{to make } 700) \\
 84 \quad (\text{to make } 784) \\
 \hline
 625
 \end{array}$$



Some children will be able to shorten this to:

$$\begin{array}{r} 784 \\ - 159 \\ \hline 41 \quad (\text{to make } 200) \\ 584 \quad (\text{to make } 784) \\ \hline 625 \end{array}$$

This informal written method is a natural progression from the work covered in week 7. If the group has made sufficient progress with subtraction, introduce them to a standard written method, first in the expanded form outlined in the *Framework*:

$$\begin{array}{r} 784 = 700 + 80 + 4 = 700 + 70 + 14 \\ - 159 \quad 100 + 50 + 9 \quad 100 + 50 + 9 \\ \hline 600 + 20 + 5 = 625 \end{array}$$

Whichever method you use, draw attention to the hundreds, tens and units columns and the need to keep digits in their correct columns. If you are introducing a standard written method, make sure that, to begin with, exchange (or 'borrowing') is required only between the tens and the ones. Explain that you need to start the calculation with the ones column, on the right-hand side. After you have demonstrated two examples, ask the children in pairs to try one for themselves.

Ask how they can check the answer is right. What is the opposite operation to subtraction? Point out that if they add the answer of the subtraction to the number they have taken away, they should reach the original number. Demonstrate on the board, getting different children to explain each step as you do it. Can they do a vertical addition?

Introduce Activity sheet 8.1 and make sure all the children know how to tackle it.

KEY QUESTIONS

- How many tens in one hundred?
- How many ones (or units) in a ten?

PLENARY

5-10
MINUTES



Which of the following calculations can you do in your heads, perhaps jotting down some figures, and which would be better done in the written, vertical way? Explain why. $277 - 19$, $213 - 76$, $794 - 208$, $700 - 689$, $856 - 293$, $4000 - 3998$.

SOMETHING TO REMEMBER

Look at the numbers carefully first before deciding the best way to do a subtraction calculation.

Unit 8

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVES

- Develop and refine written methods for subtraction, building on mental methods
- Starter: Revise multiplication and division facts for the two- and five-times tables ready for next week

VOCABULARY

Hundreds, tens and ones, take away, subtract, counting on, difference, column, digit, minus

RESOURCES

2p and 5p coins

STARTER

10
MINUTES

Revise multiplication and division facts from the two- and five-times tables. Give children access to 2p and 5p coins. Ask them to put out six 2p coins. How much do you have? Put out five 5p coins. How much do you have? How many 5p coins make up 35p? How many 2p coins make up 18p?

Remind children that every multiplication fact has a partner division fact, for example, $4 \times 2 = 8$ and $8 \div 2 = 4$. Give some multiplication facts from the two- and five-times tables and ask for the partner division facts. Now give some division facts so that the children can supply the corresponding multiplication facts.

As a group, chant both the two- and five-times tables.

KEY QUESTIONS

- What is the pattern in the five-times table?
- What is the pattern with digits in the two-times table?

MAIN ACTIVITY

30
MINUTES

Refer to the homework. Take an example from one of the children and demonstrate the subtraction calculation using the same method introduced in the lesson earlier in the week. It is important that you use exactly the same procedure. Now ask a child to come to the front to demonstrate one of his or her examples. Make sure s/he spells out exactly what s/he is writing on the board.

If the children are using a standard written method, see whether anybody has an example where they had to exchange one hundred for ten tens (or 'borrow' from the hundreds). Does anyone have an example where they had to exchange one ten for ten ones and one hundred for ten tens all in the same calculation ('borrow' from the tens and the hundreds)? If so, demonstrate on the board, getting different children to explain each step as you do it.



If the counting up (complementary addition) method is being used, see whether children would break a particular calculation up into the same or different steps.

Refer back to an example demonstrated already. Set it out on the board as a money subtraction calculation, for example:

$$\begin{array}{r} \pounds 7.49 \\ - 3.27 \\ \hline \end{array}$$

How would you do this? Is it any different? Emphasise the importance of lining up the decimal points and putting a decimal point in the correct place on the answer line to separate the pounds and pence in the answer. Ask a child to demonstrate the calculation, making sure s/he spells out what s/he is doing.

$$\begin{array}{r} 7.49 \text{ m} \\ - 3.27 \text{ m} \\ \hline \end{array}$$

Now rub out the pounds sign and replace it with m for metres:

Is a length subtraction any different? Emphasise that there are 100 centimetres in a metre just as there are 100 pence in a pound. The same principles apply. Introduce Activity sheet 8.2 and make sure that all the children know how to tackle it.

KEY QUESTIONS

- How many ones (or units) in a ten?
- How many tens in a hundred?
- How many pence in a 10p coin?
- How many 10p coins in a pound?

PLENARY



Write on the board $352 - 247$. How many different ways can you say this calculation? For example, 352 subtract 247, find the difference between 352 and 247, 352 minus 247, take 247 from 352, how much less than 357 is 247? Ask a child to do the calculation. Ask another to do it in a different way. Ask a third to check the answer by adding it to 247, the number subtracted.



Name

Date

Dear Parents and Carers,

In our lesson this week we have been learning about subtraction. Your child will show you one of the methods we have been using.

Could you help your child to complete this homework and return it to school ready for the follow-up lesson later in the week?

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

Write down any three-digit number, say 368.

Reverse the digits (in the example, 863). Subtract the smaller number from the larger one ($863 - 368 = 495$). Write down all your working on the back of this sheet.

Now check your answer by adding it to the number you took away. What answer do you get?

Do five more examples like this.

.....

.....

.....

.....

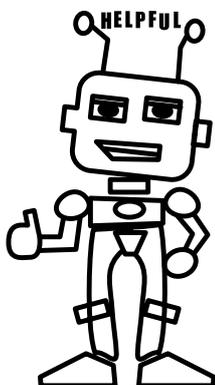
.....

Name

Date

Activity sheet 8.1

Always subtract the units first, then the tens, then the hundreds.



Complete these subtraction calculations.

$\begin{array}{r} 890 \\ - 276 \\ \hline \end{array}$	$\begin{array}{r} 952 \\ - 149 \\ \hline \end{array}$	$\begin{array}{r} 871 \\ - 466 \\ \hline \end{array}$	$\begin{array}{r} 756 \\ - 123 \\ \hline \end{array}$	$\begin{array}{r} 804 \\ - 273 \\ \hline \end{array}$
---	---	---	---	---

.....

Check to see whether the first two are correct by adding the answer to the number you took away. Do you get the original number?

--	--

Set out each sum in the box provided.

Ask your teacher for another sheet of paper for you to set out the calculations you will need to do to answer these questions about the numbers above.

607	894	150	481	139
-----	-----	-----	-----	-----

What is the difference between the largest and the smallest number?

Add together the two smallest numbers. Subtract the total from the largest number.

Which numbers give you the smallest difference?

What is the difference?

Find the two numbers you haven't used yet. Take the smaller from the larger.

Name

Date

Activity sheet 8.2

Complete these subtraction calculations.

$\begin{array}{r} \text{£ } 8.09 \\ - 2.76 \\ \hline \end{array}$	$\begin{array}{r} \text{£ } 9.24 \\ - 3.65 \\ \hline \end{array}$	$\begin{array}{r} \text{£ } 4.83 \\ - 2.24 \\ \hline \end{array}$	$\begin{array}{r} \text{£ } 6.48 \\ - 3.72 \\ \hline \end{array}$	$\begin{array}{r} \text{£ } 7.00 \\ - 3.19 \\ \hline \end{array}$
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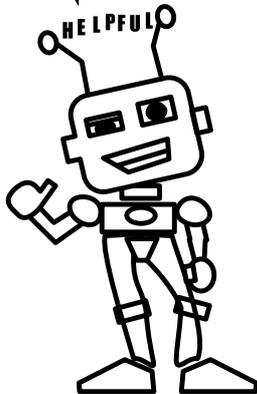
.....

Check by adding to see whether the first two are correct.

Set out each sum in the box provided.

--	--

When you write the numbers underneath each other, line up the decimal points.



Look carefully at the subtraction calculations below.

Before you work them out, decide the best way to do them; either in your head, perhaps jotting down numbers to help you, or in the written, vertical form.

Ask your teacher for another sheet of paper for you to set out any calculations you need to do on paper.

$600 - 495 = \square$	$9.57 \text{ m} - 3.94 \text{ m} = \square \text{ m}$
$806 - 375 = \square$	$7.16 \text{ m} - 4.94 \text{ m} = \square \text{ m}$
$751 - 267 = \square$	$3.74 \text{ m} - 3.42 \text{ m} = \square \text{ m}$
$505 - 499 = \square$	$7.19 \text{ m} - 3.88 \text{ m} = \square \text{ m}$

Name

Date

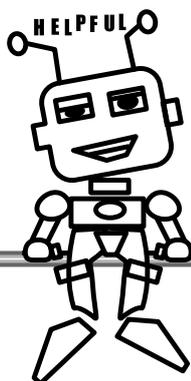
Activity
sheet

8.3

Make up five subtraction calculations using three-digit numbers of your choice.

Decide the simplest and easiest way of approaching each one before working it, and write the calculation in one of the boxes.

Check your answers. Ask yourself: will it be more or less?



Solve these problems. Work out the answers on the back of the sheet.

Hassan's mum has a ball of string 10 m long. Hassan needs 3.35 m for his model. How much is left?

Gemma has £6.27 in her money box. She is saving up to buy a new game which costs £9.99. How much more does she need?

What has to be added to 74 to make 307?

Deepa's uncle has a plank 3.51 m long. He saws it into two parts. One part is 2.64 m long. What is the length of the other part?

Unit 8

RESOURCE SHEET

UNIT
8

0	1	2
3	4	5
6	7	8
	9	

Unit 9

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Know the three-times table
- Begin to know the six-times table
- Know the four-times table (follow-up session)

VOCABULARY

times, multiplies, multiplication, product, how many ... in ... ?
divide, division, divided by, double

RESOURCES

0–9 digit cards; 100 grid; cards with the answers to the ten facts of the three-times table (see resource sheet)

HOMEWORK

Use the special number square provided for a homework game which is described in the homework letter.

STARTER

10
MINUTES

Revise division and multiplication facts from the two-, five- and ten-times tables. Remind the children that each multiplication fact has a partner division fact, for example $4 \times 5 = 20$ and $20 \div 5 = 4$.

KEY QUESTIONS

- What is one half, one fifth and one tenth of 100?
- How do you work this out?
- Which is the easiest one to work out, and which is the hardest?
- Why?

MAIN ACTIVITY

30-35
MINUTES

Use the 100 grid to count in threes up to $10 \times 3 = 30$. Count back in threes from 30 to 0. Write the three-times table on the board. Rehearse and learn.

Play the Quick Fire game. Use a set of digit cards, 0–9, shuffled. Tell the children to multiply the number you hold up by 3 as quickly as they can. Turn over the cards one at a time, and choose a child to respond.

Explain that 21 is the **product** of 3 and 7. What is the product of 3 and 5? Can you give me two other ways of saying this (3 times 5 and 3 multiplied by 5)?

Play another version of the Quick Fire game. This time, use cards which have all the multiples of three up to 30 on them. Shuffle the cards. Hold up a number. The child you choose has to give you the corresponding division fact, for example, $18 \div 3 = 6$.



Tell the children to write out the three-times table. They then have to double each answer and write this down. Ask: what pattern can you see? Demonstrate on the board that their doubles all feature in the six-times table.

Introduce Activity sheet 9.1 and make sure that all the children know how to tackle it.

**KEY QUESTIONS**

- Which statements in the three-times table are easy to remember?
- Which ones do we already know (2×3 , 5×3 , 10×3)?
- Which ones are harder to remember (7×3 , 8×3)?

PLENARY**5-10**
MINUTES

Consider the key questions above. Play the Guess My Table game. Choose one of the times-tables already introduced, the two-, three-, five-, six- and ten-times tables. The children take turns to say a number, and you say the answer using your chosen but secret table. For example, if a child says 7 and you say 14, they must guess which table it is - in this example, the two-times table.

Let different children have a turn at being the one who does the multiplying. Make the game harder by telling them that you are going to add 1 to each of your answers.

**SOMETHING TO REMEMBER**

The key facts are: $1 \times 3 = 3$, $2 \times 3 = 6$, $5 \times 3 = 15$, $10 \times 3 = 30$. If you know these, you can easily work out the others.

Unit 9

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVE

- Know the three- and four-times tables

VOCABULARY

times, multiplies, multiplication, product, how many ... in ... ? divide, division

RESOURCES

100 grid
interlocking cubes
digit cards

STARTER

10
MINUTES

What is one half of 8, 12, 16, 20? What is one quarter of each of these numbers?

What is $6 \div 3$, $9 \div 3$, $12 \div 3$, $15 \div 3$, $18 \div 3$? Tell the children that if we split up or divide something into three equal parts, each of them is called a third. What is one third of 6, 9, 12, 15, 18? Establish the fact that asking for one third is the same as dividing by 3.

KEY QUESTIONS

- What is one third of 30?
- What is another way of asking this?

MAIN ACTIVITY

25-30
MINUTES

Use the 100 grid to count in fours up to 40 and back down again. Identify the pattern the four-times table makes on the number grid. Ask the children to predict whether 84, for example, will be in the pattern. Confirm that it is. What do you know about the units digits (They end in 0, 2, 4, 6 or 8)? Write down the four-times table on the board. Get the children to chant it together.

Hold up a shape with 24 interlocking cubes. Keep breaking off groups of 4 and giving each group to a child until none is left. How many children have a group of 4 cubes? How many fours in 24? What is 24 divided by 4? What is one quarter of 24? Ask the children to help you to write all ten division facts for the four-times table on the board.



Make up some questions using multiplication and division facts from the four-times table, such as:

- Swimming sessions at the local pool last for four hours. How many sessions will there be in 12 hours?
- I can cut four cards from one big sheet. How many sheets will I need to make 36 cards?

Ask the children to show the answers by holding up digit cards.

Group the children in pairs and ask them to write each other a problem using the four- and three-times tables. They should be as imaginative as they can! Share some of the problems with the whole group and ask for answers.

Introduce Activity sheet 9.2 and make sure all the children know how to tackle it.

**KEY QUESTION**

- **The key facts for the four-times table are: $1 \times 4 = 4$, $2 \times 4 = 8$, $5 \times 4 = 20$, $10 \times 4 = 40$. How can you use these facts to work out the others if you have forgotten them?**

PLENARY**5-10**
MINUTES

Consider the key question above. Tell the children that we are going to build up a forty-times table from what we have learned today. Write each fact down on the board. What are the similarities to, and differences from, the four-times table? Explain.

Name

Date

Dear Parents/Carers,

In our lesson this week we have been looking at ways to help us learn our multiplication tables. Will you help your child to complete this homework by playing the following game with him or her?

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

The object of the game is to get as low a score as possible. Each player puts a counter or 1p coin on a corner number and then moves it, in turn, one space up, down or diagonally in any direction.

Every time the counter is moved, the player scores three times the number shown in the square; if you move to a 5, you score 15, and so on. Two counters may not occupy the same square at the same time.

Keep a running score on the chart provided. The game ends when both players have reached the corner opposite the one from which they started. The player with the lower score wins. Now play the game again, but this time multiply the scores by four.

The game

<p>Player A Running score</p> <div style="border: 1px solid black; height: 150px; width: 100%;"></div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; border-radius: 50%; width: 25%;">5</td> <td style="text-align: center; border-radius: 50%; width: 25%;">1</td> <td style="text-align: center; border-radius: 50%; width: 25%;">3</td> <td style="text-align: center; border-radius: 50%; width: 25%;">4</td> </tr> <tr> <td style="text-align: center; border-radius: 50%;">6</td> <td style="text-align: center; border-radius: 50%;">8</td> <td style="text-align: center; border-radius: 50%;">9</td> <td style="text-align: center; border-radius: 50%;">2</td> </tr> <tr> <td style="text-align: center; border-radius: 50%;">4</td> <td style="text-align: center; border-radius: 50%;">7</td> <td style="text-align: center; border-radius: 50%;">5</td> <td style="text-align: center; border-radius: 50%;">3</td> </tr> <tr> <td style="text-align: center; border-radius: 50%;">9</td> <td style="text-align: center; border-radius: 50%;">8</td> <td style="text-align: center; border-radius: 50%;">1</td> <td style="text-align: center; border-radius: 50%;">2</td> </tr> </table>	5	1	3	4	6	8	9	2	4	7	5	3	9	8	1	2	<p>Player B Running score</p> <div style="border: 1px solid black; height: 150px; width: 100%;"></div>
5	1	3	4															
6	8	9	2															
4	7	5	3															
9	8	1	2															

Name

Date

Activity sheet 9.1

Fill in this multiplication grid.

×	1	3	5	10	2
1	1				
3		9			
5			25		
10				100	
2					4

Complete these multiplications.

× 3 = 30

3 × = 9

8 × 3 =

× 3 = 12

× 3 = 27

× 9 = 18

2 × = 12

3 × = 21

4 × 6 =

× 3 = 15

× 3 = 18

6 × = 36

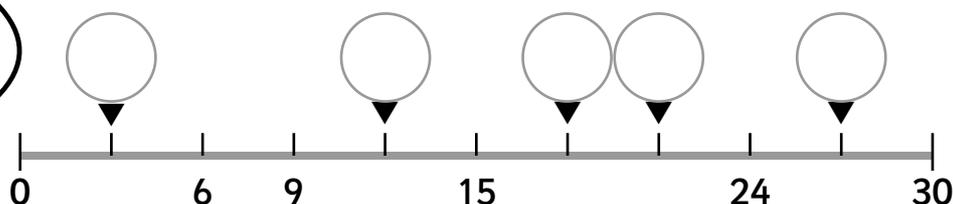
Practice makes you better!



12 children have new pairs of shoes. How many shoes are there?

Cakes are packed into boxes of 6. There are 18 cakes. How many boxes are needed?

Fill in the bubbles with the correct numbers.



Name

Date

Activity sheet **9.2**

Fill in the missing numbers.

$\square \times 4 = 20$

$\square \times \square = 28$

$3 \times \square = 24$

$7 \times \square = 21$

$6 \times \square = 18$

$\square \times 9 = 27$

Complete these number sentences:

$\bigcirc \times 3 = 18$

$\bigcirc \times 5 = 15$

$\bigcirc \times 4 = 24$

$18 \div 3 = \bigcirc$

$15 \div 5 = \bigcirc$

$24 \div 4 = \bigcirc$

$\bigcirc \times 3 = 12$

$\bigcirc \times 4 = 32$

$\bigcirc \times 3 = 30$

$12 \div 3 = \bigcirc$

$32 \div 4 = \bigcirc$

$30 \div 3 = \bigcirc$

$\bigcirc \times 4 = 16$

$\bigcirc \times 3 = 24$

$\bigcirc \times 4 = 36$

$16 \div 4 = \bigcirc$

$24 \div 3 = \bigcirc$

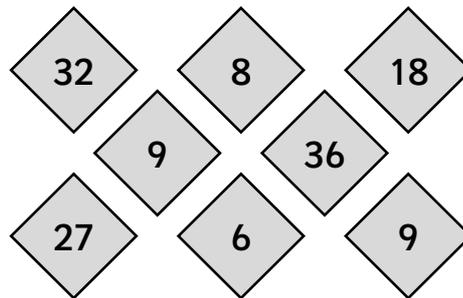
$36 \div 4 = \bigcirc$

$18 \div 3 = 6$

So $6 \times 3 = 18$



Choose numbers to make each division fact.



$\square \div 3 = \square$

$\square \div 4 = \square$

$\square \div 4 = \square$

$\square \div 3 = \square$

Name

Date

Activity sheet

9.3

Complete these tables.

Count in fours

Count in threes

Count in eights (double the fours)

Count in sixes (double the threes)

4	3
8	6
12	9
20	15
40	30

8	6
40	30

Doubling makes multiplication easier!



Solve these problems.

Tom went out shopping and bought five cassette tapes at £3 each. He then bought three hot dogs at 80p each. How much did he spend in all?

Sally cycles three miles to school and three miles home every weekday, and cycles four miles each way to her granny's house on Saturday and on Sunday. How far does she cycle each week in total?

Jim's dog eats two tins of food a day. How many tins does Jim's dog eat each week?

(Clue: work out first how far she travels for the five days she is at school)

3

6

9

12

15

18

21

24

27

30

Unit 10

• LEAD LESSON •

TOTAL TIME

50
MINUTES

OBJECTIVES

- Develop and refine written methods for multiplication (two-digit \times single digit)
- Approximate the answer first

VOCABULARY

multiplication, multiply by, division, divided by, approximation

RESOURCES

digit cards; place value cards

HOMEWORK

Work out how much it would cost to have a newspaper each day for five days (see Homework sheet). How much do four packets of your favourite sweets cost? (You may wish to send parents a worked example of a multiplication calculation)

STARTER

10
MINUTES

Ask quick-fire questions about multiplication and division facts for the two-, three-, four-, five- and ten-times tables, using different ways of expressing the two operations. How many fours in 20? What is the product of 3 and 4? What is 21 divided by 3? What is one fifth of 30? What is 6 multiplied by 4?

Extend to simple word problems, such as: 'What is the cost of 3 CDs at £7 each?' or 'Four meals cost £20; what does one meal cost?' Tell the children to hold up their digit cards to show their answers.

KEY QUESTIONS

- What is one quarter of 100?
- How did you get that answer?
- Did anyone do the sum a different way?
- How many fours in 100?
- How many fours in 200?
- How many threes in 90?
- What is one third of 90?

MAIN ACTIVITY

30
MINUTES

Revise multiplying by 10. Multiply numbers 1 to 9 by 10. Now multiply numbers 1 to 9 by 20 and record the answers on the board. Repeat for 30 and record. Do not rub out these tables.

Write 23×5 on the board. Remind the children that they can do 20×5 and point to this, saying: but you need to do 23×5 . Find out whether and how the children would tackle this. If they have a method that they can carry out accurately and reasonably quickly, reinforce this. Otherwise demonstrate the grid method for $TU \times U$ as set out on page 66 of part 6 of the *Framework for teaching mathematics*.



If you are going to use the grid method, say that you can do the calculation in two parts. Set it out as illustrated below. Say that you are going to split the 23 into 20 and 3. They already know 20×5 . Write 100 in the left-hand box. What are five threes? Write 15 in the right-hand box. Point to both totals. Say: 5 twenties are 100 and 5 threes are 15. Write in the answer.

$\times 5$	20	3	
	100	15	
	$100 +$	$15 =$	115

Repeat this process for 34×3 and for 26×4 . Ask the children to approximate first. Now ask them, in pairs, to make up a similar example to do together.

Introduce Activity sheet 10.1 and make sure they all know how to tackle it. Make sure that the place value cards do not give the children these difficult combinations: 7×7 , 7×8 , 7×9 , 8×8 , 8×9 , 9×9 .

KEY QUESTIONS

- How do we split the number to multiply it?
- Which digit do we multiply first?

PLENARY



Ask the children which calculations on the Activity sheet were the hardest, and which the easiest. Why?

Which of the following are easy enough to calculate in your head, and which would best be done using the written method we have been practising: 99×4 , 20×3 , 46×7 , 31×3 ? Why?

Ask the children to work out each example.



SOMETHING TO REMEMBER

Before multiplying a two-digit number, split it into tens and ones and multiply each separately. Then add the answers together.

Unit 10

FOLLOW-UP SESSION

TOTAL TIME

45
MINUTES

OBJECTIVES

- Develop and refine written methods for multiplication (two- and three-digit \times one-digit)
- Approximate the answer first

VOCABULARY

multiplication, multiply by, division, divided by, approximation

RESOURCES

cards in the range 20 to 50; 1–6 dice

STARTER

10
MINUTES

Count in fours to 40 and back again to zero. Ask the children to give you the key facts for the six-times table and write them on the board: $1 \times 6 = 6$, $2 \times 6 = 12$, $5 \times 6 = 30$, $10 \times 6 = 60$. Tell them to use these facts to work out the rest of the table.

Ask the children to give you the numbers in the four-times table. Write them on the board. Ask them to double each number. Write the answers on the board. What table have we created? Ask the children to compare the two sets of numbers and look for patterns.

Finish by asking some quick-fire questions about the six- and eight-times tables, such as 3 multiplied by 8 and 30 divided by 6.

KEY QUESTIONS

- What are the key facts for the eight-times table?
- How can you remember them?
- How can you use them to help you find the other facts?

MAIN ACTIVITY

30
MINUTES

Using the method explained earlier in the week, demonstrate the multiplication calculation set for homework to find the cost of one of the newspapers over five days. First, ask a child to say what calculation is needed, then ask the group to estimate the answer before you begin the calculation. Get different children to explain each step as you do it. What unit is the answer in? (Pence.) How can we convert this to pounds?



Split the group into pairs and give each pair five cards from a well-shuffled pack, numbered in the range 20 to 50, and a dice. They are to pick up a card and roll the dice. If they get a 1, they roll again. Otherwise, they multiply the number on the card by the number on the dice. Each pair should do at least three multiplication calculations in this way.

Try multiplying a three-digit number by the number on the dice. Ask the children to discuss in pairs how they might calculate 143×5 . If you are using the grid method, demonstrate as illustrated. Ask a child to explain how you did it.

$\times 5$	100	40	3	
	500	200	15	
	500	+ 200	+ 15	= 715

Introduce Activity sheet 10.2 and make sure all the children know how to tackle it.

KEY QUESTIONS

- Which digit do we multiply first?
- How do we know what the total is?
- Which part of the grid gives you the best approximation of the answer?

PLENARY

5
MINUTES

Consider the key questions above. Supposing somebody in your family had a comic or magazine costing £1.35 a week. How much would that cost over four weeks? How about six weeks? Ask a child to tackle this on the board. How are you going to deal with the pounds and pence?

Name

Date

Dear Parents and Carers,

In our lesson this week, we have been learning about multiplying a two-digit number by a single-digit number. Your child will show you one of the methods we have been using.

Will you help your child to complete this homework and return it to school for the follow-up session later this week?

Thank you for your help. Have fun!

Your child's Springboard 5 teacher

How much would it cost to have each paper for 5 days a week? Do your calculations on the back of this sheet.

.....

.....

.....

.....

How much does your favourite packet of sweets or chocolate bar cost? Choose something under £1.

..... p

How much do four of these cost?

.....

Name

Date

Activity sheet

10.1

Turn a pack of place value cards upside down. Choose 1 tens card and 2 ones cards, for example,



Make two different multiplication questions, such as 67×3 and 63×7 . Predict which will give you the bigger number. Do the calculations on the back of the sheet. Make sure your answers are clear.

Now choose another set of place value cards. Do this five times altogether.

..... \times =

..... \times =

Which do you think will give the bigger number?

..... \times

..... \times =

..... \times =

Which do you think will give the bigger number?

..... \times

..... \times =

..... \times =

Which do you think will give the bigger number?

..... \times

..... \times =

..... \times =

Which do you think will give the bigger number?

..... \times

..... \times =

..... \times =

Which do you think will give the bigger number?

..... \times

Name

Date

Activity sheet

10.2

Do these multiplication calculations in the spaces provided and fill in the answers.

$23 \times 3 = \dots\dots\dots$

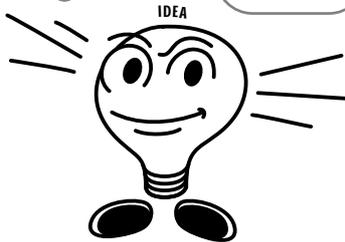
$42 \times 5 = \dots\dots\dots$

$61 \times 4 = \dots\dots\dots$

Multiply the tens number then the ones number

add them together

$60 + 9 = 69$



$58 \times 6 = \dots\dots\dots$

$145 \times 3 = \dots\dots\dots$

Decide which of these calculations you can do in your head and which you will need to work out on paper. Write 'H' beside those you do in your head. Show your working for the others.

$121 \times 5 = \dots\dots\dots$

$570 \times 10 = \dots\dots\dots$

$49 \times 6 = \dots\dots\dots$

$61 \times 4 = \dots\dots\dots$

$99 \times 2 = \dots\dots\dots$

$50 \times 5 = \dots\dots\dots$

Name

Date

Activity sheet

10.3

What are the key facts for the eleven-times table?



Use the key facts to help you work out the rest of the table.

$1 \times 11 = 11$

$2 \times 11 = \square$

$5 \times 11 = \square$

$10 \times 11 = \square$

$3 \times 11 = \square$

$4 \times 11 = \square$

$6 \times 11 = \square$

The pattern is easy to remember!



$7 \times 11 = \square$

$8 \times 11 = \square$

$9 \times 11 = \square$

Using your eleven-times table to help you, build up the twelve-times table.

$1 \times 12 = \square$

$2 \times 12 = \square$

$3 \times 12 = \square$

$4 \times 12 = \square$

$5 \times 12 = \square$

$6 \times 12 = \square$

$7 \times 12 = \square$

$8 \times 12 = \square$

$9 \times 12 = \square$

$10 \times 12 = \square$

Do the following calculations.

$11 \times 11 = \square$

$8 \times \square = 96$

Use the two tables above to help you whenever you can.

$12 \times 12 = \square$

$11 \times 12 = \square$

$3 \times 13 = \square$

$112 \times 3 = \square$

Make up an eleven-times table question for your friend.

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