Unit 4
Fractions and decimals

Year 5
Spring term

This unit plan is designed to guide your teaching.
You will need to adapt it to meet the needs of your class.

Unit Objectives
Year 5

- Order a set of fractions, such as 2, 2¾, 1¾, 1½, and position them on a number line.   Page 23
- **Relate fractions to division** and use division to find simple fractions, including tenths and hundredths, of numbers and quantities.   Page 25
- Order a set of numbers or measurements with the same number of decimal places.   Page 29
- **Round a number with one or two decimal places to the nearest integer.**   Pages 31

Resources needed to teach this unit:

- Resource sheet 4.1
- Resource sheet 4.2
- Resource sheet 4.3
- OHT 4.1
- Whiteboards
- A3 paper
- Counting Stick

Link Objectives

Year 4

- Order simple fractions: for example, decide whether fractions such as $^3/_8$ or $^7/_{10}$ are greater or less than one half.
- **Recognise simple fractions that are several parts of a whole and mixed numbers** such as 5¾ .
- Begin to relate fractions to division and find simple fractions such as ½ , $^1/_3$, ¼ , $^1/_5$, $^1/_{10}$ of numbers or quantities.
- Understand decimal notation and place value for tenths and hundredths and use it in context.
- Round a sum of money to nearest pound.
- **Round any positive integer less than 1000 to the nearest 10 or 100.**

Year 6

- Order fractions such as ¾ , $^2/_3$, and $^5/_6$ by converting them to fractions with a common denominator, and position them on a number line.
- **Use a fraction as an 'operator' to find fractions** including tenths and hundredths **of numbers or quantities.**
- Use decimal notation for tenths and hundredths in calculations, and tenths, hundredths and thousandths when recording measurements.
  Know what each digit represents in a number with up to three decimal places.
  Order a mixed set of numbers or measurements **with up to three decimal places.**
- Round a number with two decimal places to the nearest tenth or to the nearest whole number.

(Key objectives in bold)

Planning sheet	Day One (page 1 of 2)	Unit 4 *Fractions and decimals*		Term: *Spring*	Year Group: *5*
Oral and Mental		**Main Teaching**			**Plenary**
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities		Teaching Activities/Focus Questions
Recall multiplication and division facts involving the 2, 3, 4, 6, 7 and 8 times table.	• Display Resource sheet 4.1. • Ask children questions involving multiplication and division, drawing on the numbers displayed. Children to show their answers on whiteboards. Use a range of vocabulary associated with multiplication and division such as: **Q** What is the product of 7 and 8? **Q** What factors of 60 are on the sheet? **Q** Which numbers are multiples of 6? **Q** Which numbers are square numbers? **Q** What is 21 divided by 3?	Relate fractions to division and use division to find simple fractions, including tenths and hundredths, of numbers and quantities.	• Write on the board: 32, 40, 24, 36, 56, 44, 140, 84. **Q** What is half of each of these numbers? Collect answers. Record each answer below the numbers. Relate finding half to dividing by 2. **Q** What is a quarter of each of these numbers? Collect answers and record on the board. Relate finding a quarter to halving and halving again and to dividing by 4. • On the board, under 32, 16, 8 draw the grid: 	8	8
---	---
8	8	 Say that this diagram represents 32 divided by 4. **Q** How can we use the grid to find ¾ of 32? Agree the answer is 8 + 8 + 8 = 24, which represents finding ¼ + ¼ + ¼ or ¼ x 3. Ask children to find ¾ of each of the other numbers on the board. • Write 9, 21, 36, 60, 330, 150, 99, 270. **Q** What is a third of each of these numbers? Collect and record answers and relate finding a third to dividing by 3. **Q** How can we use these answers to find two-thirds of the numbers? Establish that: $\frac{2}{3} = \frac{1}{3} + \frac{1}{3}$ or $\frac{1}{3}$ x 2. • On the board write: $\frac{4}{5}$. **Q** How can we find $\frac{4}{5}$ of 30? Collect children's methods and record them on the board. Establish that $\frac{1}{5}$ of 30 is 6 and as $\frac{4}{5}$ is $\frac{1}{5}$ x 4, $\frac{4}{5}$ of 30 is 6 x 4 = 24. **Q** How can we find $\frac{3}{5}$ of 35, $\frac{2}{5}$ of 45?		• Write on the board: £520 32 m 28 kg Ask children to find fractions of these quantities and explain the calculation they used. **Q** What is $\frac{3}{10}$ of £520? **Q** If $\frac{3}{8}$ of 32 m is 12 m, what is $\frac{6}{8}$ of 32 m? What is ¾ of 32 m? **Q** What is $\frac{1}{7}$ of 28 kg? What is $\frac{3}{7}$, $\frac{6}{7}$, $\frac{9}{7}$ of 28 kg? Collect and discuss children's answers.
VOCABULARY factor product divided by multiple square RESOURCES Whiteboards Resource sheet 4.1		VOCABULARY numerator denominator tenths hundredths RESOURCES A3 paper			

Planning sheet	Day One (page 2 of 2)	Unit 4 *Fractions and decimals*	Term: *Spring*	Year Group: *5*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
			Discuss the children's methods with the class. Emphasise the methods for finding three-fifths: divide the denominator by 5 then multiply the answer by the numerator 3. • Set children to work in small groups at writing a brief description of the general method on a sheet of A3 paper. Display them and discuss them with the class. • On the board write: $1/3$ ——— 36 $2/3$ ——— **Q** What is $1/3$ of 36? What is $2/3$ of 36? Collect answers and add them to the diagram. **Q** What is $3/3$ of 36? What is $4/3$ of 36? Collect answers. Remind children that three-thirds is the whole of 36 while four-thirds is a third more so the answer is 48. Add these to the diagram i.e. $1/3$ ——— 12 $2/3$ ——— 24 36 $3/3$ ——— 36 $4/3$ ——— 48 • Write on the board: 45 (fifths); 48 (sixths); 21 (sevenths); 56 (eighths). In their groups ask children to find fifths of 45, sixths of 48 etc. • Collect answers by asking questions to ensure children can apply the method e.g. **Q** What is $6/7$ of 21? Correct any errors and misconceptions.	**By the end of the lesson, children should be able to:** • **Relate fractions to division;** • **Find fractions of numbers and quantities.** (Refer to supplement of examples section 6, page 25.)

Planning sheet	Day Two		Unit 4 *Fractions and decimals*	Term: *Spring*	Year Group: *5*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
Multiply or divide whole numbers up to 10 000 by 10 or 100.	• Display Resource sheet 4.1. Point to a number on the sheet e.g. 4. **Q** What number is 10 times bigger? What number is 100 times bigger? Collect children's answers on whiteboards. Repeat using other numbers. • Write on the board a 100 multiple of a number on the sheet e.g. 1800. **Q** What number is 10 times smaller? What number is 100 times smaller? Collect answers. • Ask children to multiply and divide given numbers by 10 and 100 e.g. **Q** What is 9200 divided by 100? Correct any errors and misunderstandings.	Relate fractions to division and use division to find simple fractions, including tenths and hundredths of numbers and quantities.	• Remind children how they found $^3/_{10}$ of £520. Record as: $^3/_{10}$ of £520 = (£520 ÷ 10) x 3 = £52 x 3 = £156. Remind them that the bracket shows which calculation to do first. • On the board write: $^4/_5$ of 35 m = • With the class complete the calculation with children prompting the steps needed. Repeat with children completing the calculations at the board. • Say that £120 was shared out this way: A had $^1/_6$, B had $^2/_5$, C had $^3/_{10}$. **Q** If D had the rest, how much did D have? Give the class time to work out the problem. Work through the solution on the board, prompted by the children and recording: A: $^1/_6$ of £120 = £120 ÷ 6 = £20 B: $^2/_5$ of £120 = (£120 ÷ 5) x 2 = £24 x 2 = £48 C: $^3/_{10}$ of £120 = (£120 ÷ 10) x 3 = £12 x 3 = £36 £20 + £48 + £36 = £104 D gets £120 – £104 = £16. • Give out Resource sheet 4.2 for children to work on. Explain how children are to present their work, drawing on the examples on the board. • Collect answers and discuss the children's methods.	• It is the school activity day for the 160 children at Lovemaths primary! **Q** $^3/_{10}$ of the children play table tennis. How many children is that? **Q** $^2/_5$ of the children play football. How many is that? **Q** ¼ of the pupils choose a cookery activity. How many are in the kitchen? **Q** What number of the pupils can't decide what to do? Collect and discuss children's answers. HOMEWORK – Set children question 4 on Resource sheet 4.2.
		VOCABULARY numerator denominator		**By the end of the lesson children should be able to:** • **Relate fractions to division;** • **Find fractions of numbers and quantities;** (Refer to supplement of examples, section 6, page 25.)
RESOURCES Resource sheet 4.1 Whiteboards		RESOURCES Resource sheet 4.2 Calculators		

Planning sheet	Day Three (page 1 of 2)	Unit 4	*Fractions and decimals*	Term: *Spring*	Year Group: *5*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
Count steps of a quarter, a third etc.	• Use the counting stick, start at 0 and have the class count forwards in steps of a quarter, 0, ¼, $^2/_4$, ¾, $^4/_4$. Stop at four quarters. **Q** What does four quarters of something represent? Establish it represents the whole of something and $^4/_4$ is the same as 1. Repeat the count this time with the class saying: 0, ¼, $^2/_4$, ¾, $^4/_4$ or 1. **Q** What comes after $^4/_4$ in our count? Establish it is $^5/_4$. **Q** Can we represent $^5/_4$ another way? Collect answers and establish it is 1 whole and ¼. • Continue the count: $^5/_4$ or 1¼, $^6/_4$ or 1$^2/_4$ etc. At $^8/_4$ introduce 2 etc. up to $^{10}/_4$ or 2$^2/_4$. • Count in steps of a third, a half and a fifth. Use mixed and improper fractions.	Order a set of fractions including mixed numbers and position on a number line.	• Discuss the homework question and correct any mistakes. • On the board write: $^4/_4 = 1$, $^3/_3 = 1$, $^2/_2 = 1$, $^5/_5 = 1$. **Q** What other fractions are equivalent to 1? Collect and record answers. **Q** If a fraction is equivalent to 1, what can you say about the numerator and the denominator? Establish they are equal. • On the board write: $^8/_4$; $^6/_3$; $^4/_2$; $^{10}/_5$. **Q** How else can we represent these fractions? Collect answers and discuss which other fractions are equivalent to 2. **Q** What fractions would be equivalent to 3, 4, 5 etc? Collect answers and record some examples on the board. **Q** How do we decide whether a fraction is equivalent to a whole number? Discuss the relationship between the numerator and the denominator. • On the board write: $$\frac{\square}{6} , \frac{\square}{10} , \frac{\square}{3} , \frac{\square}{4}$$ Point to the first fraction. **Q** What must the numerator be to make this fraction equivalent to 5? Why? Establish the numerator must be 30 as 5 x 6 = 30. Repeat. • On the board write: $$\frac{36}{\square} , \frac{40}{\square} , \frac{120}{\square}$$ Point to the first fraction. **Q** What must the denominator be to make this fraction equivalent to 4? Why?	• Collect answers and correct any mistakes or misunderstandings. • Write on the board: 2$^2/_3$, $^7/_3$, 1¾, $^3/_2$, $^5/_4$. With the class prompting you, convert to mixed fractions and place on a number line. **Q** Which is larger 2$^2/_3$ or 2¼? Collect answers and establish that we need only compare $^2/_3$ and ¼ as each mixed number has 2 as the whole number part. Agree that $^1/_3 > ¼$.
VOCABULARY proper mixed improper fractions RESOURCES Counting stick		VOCABULARY equivalent fractions numerator denominator fractions		

Planning sheet	Day Three (page 2 of 2)	Unit 4 *Fractions and decimals*		Term: *Spring*	Year Group: *5*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
			Establish the denominator must be 9 as $36 \div 9 = 4$. Repeat.	

Teaching Activities (Main Teaching continued):

- On the board write: $\frac{16}{5}$.

Q Which whole numbers does this fraction lie between?

Collect answers. Remind children of the signs > and <.
Record: $\frac{16}{5} > \frac{15}{5}$ (=3); $\frac{16}{5} < \frac{20}{5}$ (=4).

Q How else can we represent this fraction?

Establish that $\frac{16}{5} = 3\frac{1}{5}$.

Ensure the children understand that this is a mixed number which represents 3 whole numbers and $\frac{1}{5}$. On a number line record:

$3\frac{1}{5}$

Number line marked 0, 1, 2, 3, 4, 5 with an arrow pointing between 3 and 4.

- Repeat for $\frac{9}{4}$, $\frac{11}{3}$, $\frac{29}{6}$, $\frac{11}{10}$ etc. Each time adding the fraction to the number line.

- Explain to the class that this is a way of ordering fractions and mixed numbers.
  Write: $\frac{9}{4}$, $\frac{7}{4}$, $\frac{5}{2}$, $\frac{15}{8}$, $\frac{23}{8}$, $\frac{19}{8}$.
  Ask children to convert these to mixed numbers.

- Collect answers and record on the board under the fractions;
  2¼, 1¾, 2½, $1\frac{7}{8}$, $2\frac{7}{8}$, $2\frac{3}{8}$.

  Ask children to record the numbers on a number line.

- Collect answers and record on the board. Remind the children that ¼ is equivalent to $\frac{2}{8}$, ¾ to $\frac{6}{8}$ and ½ to $\frac{4}{8}$.

- Set children other sets of improper fractions to convert to mixed numbers and order on a number line.

Plenary — Teaching Activities/Focus Questions:

By the end of the lesson children should be able to:

- **Convert improper fractions to mixed numbers;**
- **Place fractions in order.**

(Refer to supplement of examples, section 6, page 23.)

Planning sheet	Day Four	Unit 4 *Fractions and decimals*	Term: *Spring*	Year Group: *5*

Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
Round numbers with one decimal place to the nearest integer.	• Explain that positive and negative whole numbers are called integers e.g. 3, 301, –7 are all integers. • On the board write: 9.1, 9.3, 9.6, 9.9 **Q** How do we round these numbers to the nearest integer? Establish that 9.1 and 9.3 round to 9 while the others round to 10. Remind children that 9.5 represents 9½ which rounds to 10. Draw a number line to illustrate that 9.5, 9.6 to 9.9 round to 10, while 9.4 to 9.1 round to 9. • Give children numbers to round to the nearest integer e.g. 10.7, 3.2, 1.1, 0.9, 0.1. • Write 4 on the board. **Q** Which numbers with 1 decimal place round to 4? Collect answers and establish that numbers from 3.5 to 4.4 round to 4. • Repeat using 7, 1 and 0.	Round a number with one or two decimal places to the nearest integer.	• Draw a number line on the board and mark the ends 3 and 4. Write on the board: 3.32, 3.68, 3.94 and 3.17. Invite children to place these numbers on the number line. Reinforce 3.32 is 'three point three two' not 'three point thirty-two' etc. **Q** What could we put on the line to help us? Label 3.1 and 3.2 etc. Say 3.1 is equivalent to 3.10, ('three point one zero'), 3.2 is equivalent to 3.20 etc. Display 3.10 underneath 3.1, 3.20 underneath 3.2 etc. Using this labelled number line, place the number 3.32 etc on the number line. • Discuss their positions relative to 3.1, 3.2 etc. Ask: **Q** Would 3.32 be rounded down to 3 or up to 4? Establish that 3.32 would round to 3. Round the other numbers on the number line. **Q** Which digit is most important when we are deciding how to round numbers to the nearest integer? Discuss the values of the decimal digits and the importance of 5 in the first decimal place. • Ask children to use a number line, ends marked 7 and 8, and use it to place and round: 7.13 7.74 7.57 7.28 7.83 7.46 • Discuss children's answers and address any misconceptions. • Set children to round these lengths to the nearest metre 5.73 m 2.97 m 12.03 m 8.48 m 9.25 m 16.52 m • Discuss and correct any errors.	• Say I start with a number which has two decimal places. I rounded it to the nearest integer. The answer was 3. **Q** What could my number be? Discuss suggestions. **Q** What is the largest or smallest number that I could have started with? Show OHT 4.1 and ask children to round each price to the nearest £. • Write £3.49 on the board. **Q** Will this round to £3 or £4? Establish it rounds to £3 as it is below £3.50 the half-way point between £3 and £4. **By the end of the lesson children should be able to:** • **Round decimals with one or two decimal places to the nearest whole number.** (Refer to supplement of examples, section 6, page 31.)
VOCABULARY integer one decimal place positive negative		VOCABULARY integer decimal RESOURCES OHT 4.1		

Planning sheet	Day Five	Unit 4 *Fractions and decimals*	Term: *Spring*	Year Group: *5*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
Recognise and extend sequences formed by counting from any number in steps of constant size.	• Tell children you will start with a sequence of numbers and when they recognise the pattern to join in e.g. 1.2, 1.4, 1.6, … ¼, ½, ¾, … 0.3, 0.6, 0.9, … 25, 50, 75, … 150, 300, 450, … Ask children to describe the sequences in words. • Repeat counting backwards e.g. 98, 96, 94… 5, 4.7, 4.4, 4.1… 3, $2^2/_3$, $2^1/_3$, 2… • Invite a child to start a sequence of numbers.	Order a set of measurements. VOCABULARY convert lightest tallest shortest longest highest most least RESOURCES Resource sheet 4.3	• Draw a number line on the board from 5.9 to 6.1. Ask children to place 5.93, 5.99, 6.06, 6.01, 5.91 on the line. Discuss their methods and address misunderstandings. • Write on the board: 1.81 m, 186 cm, 1.83 m and 1865 mm. Ask children to order these distances. With the class write below each their equivalent values in m, cm, mm i.e. | 1.81 m	1.86 m	1.83 m	1.85 m
181 cm	186 cm	183 cm	185 cm
1810 mm	1860 mm	1830 mm	1850 mm | Emphasise how much easier it is to add distances when they are in the same units e.g. mm. • Use Resource sheet 4.3. Discuss the information it contains. **Q** Who has the longest reach? Who jumped the furthest? Discuss answers and ask: **Q** What would make it easier to compare the statistics? Discuss what should be converted, and how to present the information showing the order of the four people by height, weight etc. • Ask children to convert all the measurements. • Discuss answers and correct errors. Ask children to make two statements about each of the four people on the basis of the ordered data e.g. Jo is the shortest but not the lightest.	• Collect and discuss the children's statements. Identify the vocabulary used when comparing e.g. tallest, smallest etc. • On the board write: Tom – 2004 mm, 8005 mm, 110 cm, 168 cm, 37 m, 8.4 m. **Q** What can you say about Tom? Establish he is not the tallest or the shortest; he can jump the highest, but throw the least etc. **By the end of the lesson children should be able to:** • **Put decimals in order largest or smallest first.** (Refer to supplement of examples, section 6, page 29.)

4	48	24	21	8
28	56	36	15	32
12	27	64	2	9
7	3	6	54	18

1.   Find $\frac{4}{5}$ of £350 $\frac{7}{10}$ of £600
                   $\frac{2}{3}$ of £4.50 $\frac{3}{10}$ of £32
                   $\frac{5}{6}$ of 72km $\frac{2}{5}$ of 65 litres
                   $\frac{6}{7}$ of 42m $\frac{3}{8}$ of 248kg
                   $\frac{5}{8}$ of 56g $\frac{42}{100}$ of £300
                   $\frac{17}{100}$ of 2000km $\frac{52}{100}$ of 50 litres

2.   A length of cloth is 12m. It is used to make clothes.

Trousers	Jacket	Sleeves	Skirt
$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{6}$	?

← ————————————————————————— →
                                12m
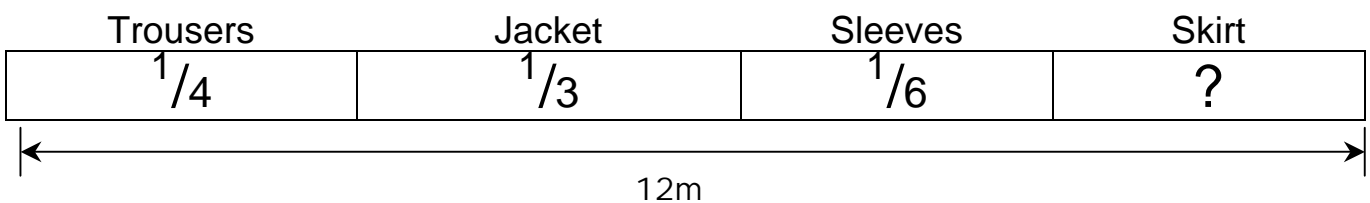
   How much material is there for the skirt?

3.
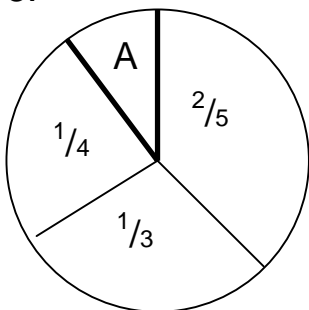
   The pie chart represents children in a
   school of 300 children. A represents
   those children who were absent.

   How many children were absent?

4.   In a 24 hour day, the children in a school say they spend $\frac{3}{8}$ of the time
      sleeping, ¼ at school, $\frac{1}{12}$ watching the TV, and $\frac{1}{6}$ travelling and playing.
      How much time is there left in their day?

	Harrun	**Jo**	**Ben**	**Ali**
Height	173 cm	1.68 m	2030 mm	179 cm
Weight	72.25 kg	75 250 g	83 250 g	78 670 g
Stride	1.22 m	119 cm	1130 mm	1.21 cm
Reach	158 cm	1540 mm	1.67 m	1660 mm
Throw	38.75 m	3705 cm	38 250 mm	3755 cm
Jump	837 cm	8.38 m	8020 mm	818 cm

Prices
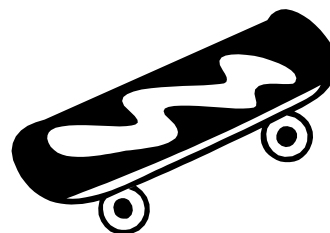
£13.10   **£0.99**   **£27.69**
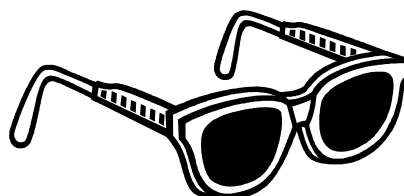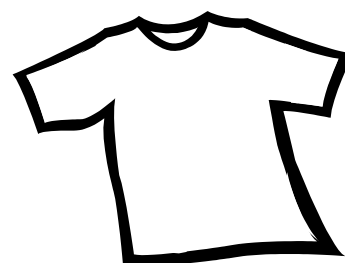
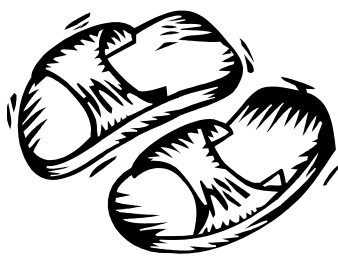**£5.75**   **£8.05**   **£4.59**
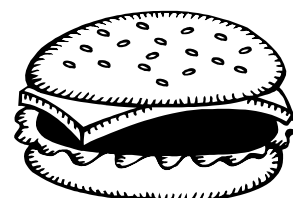
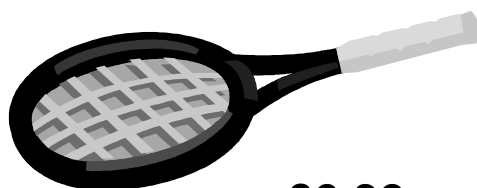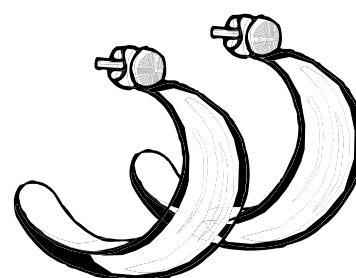**£1.25**   **£11.50**   **£2.99**

£6.39   **£43.45**   **£27.85**