Unit 10
Money and real life problems

Five daily lessons

Year 4
Autumn 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 4

- **Choose and use appropriate number operations and appropriate ways of calculating (mental, mental with jottings, pencil and paper) to solve problems.**

  Page 74

- Use all four operations to solve word problems involving numbers in 'real life', and money, using one or more steps.

  Pages 82-89

- Check with an equivalent calculation.

  Page 72

Link Objectives

Year 3

- **Choose and use appropriate operations to solve word problems.**

- **Explain methods and reasons** orally and, where appropriate, in writing.

- Check with an equivalent calculation.

(Key objectives in bold)

Year 5

- Choose and use appropriate number operations to solve problems, and appropriate ways of calculating: mental, mental with jottings, written methods, calculator.

- Explain methods and reasoning, orally and in writing.

- Check with an equivalent calculation.
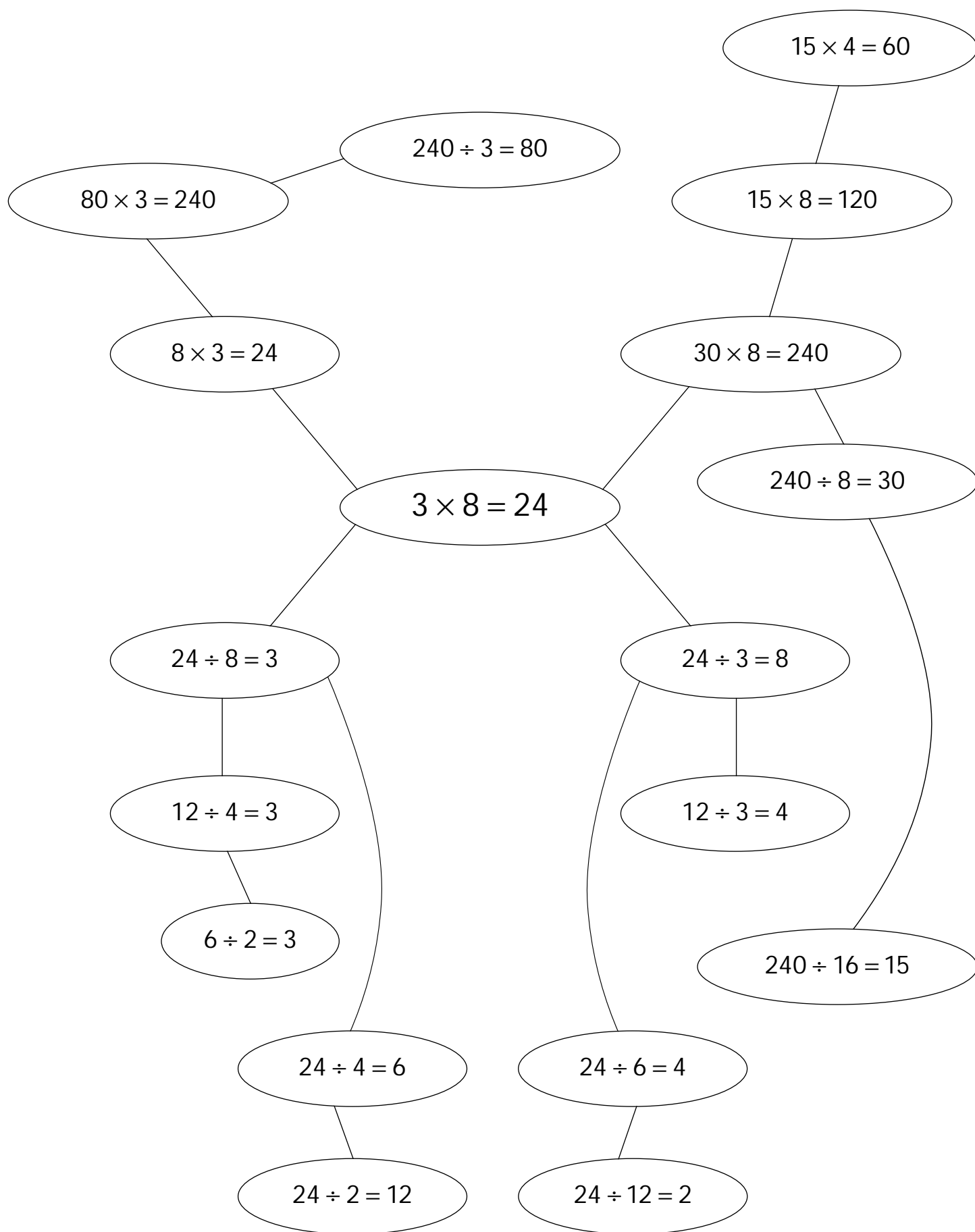
Resources needed to teach this unit:

- Resource sheet 10.1
- Resource sheet 10.2 (4 sheets)
- Resource sheet 10.3 (2 sheets)
- Resource sheet 10.4
- Activity sheet 10.1
- Whiteboards
- 'Counter' from NNS ICT pack or OHP calculator

department for
education and skills

Planning sheet	Day One	Unit 10 *Money and real life problems*	Term: *Autumn*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Recall multiplication facts in 4 times table and derive division facts.	• Count on and back in fours. Ask questions such as: **Q** What is 4×7? **Q** What is the product of 4 and 8? **Q** What multiple of 4 gives 44? • Make links between multiplication and division. Ask questions such as: **Q** What is 4×9? **Q** Share 36 by 4. **Q** How many groups of 9 are there in 36? • Establish that a strategy for multiplying 4 is doubling and doubling again and when dividing by 4, halving and halving again. • Display the following pairs of numbers on the board. Ask children to link pairs of numbers $\times 4$ 18 92 12 84 23 48 14 52 21 60 15 72 13 56
VOCABULARY grouping sharing equally divide product multiple	

Main Teaching

Objectives and Vocabulary	Teaching Activities

Use pencil and paper methods to multiply.
 	
Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps.
 	
Explain and record methods.
 	
Check with equivalent calculation.
	• Display a problem where multiplication is needed, e.g.
	
	John has 19 pages in his sticker album. He can fit 4 stickers on a page. How many stickers will he need to fill his album?
	
	Q How many stickers do you think John will need? How can we make a sensible estimate?
	
	Take responses, asking children to explain and justify their estimates.
	
	Q How can we calculate how many stickers John will need?
	
	Establish that the calculation needed is 19×4.
	
	Q How can we work it out?
	
	Discuss strategies and allow children a short time to complete the calculation and answer the question in a sentence.
	
	Q Does the answer make sense?
	
	Collect responses, comparing them to the estimate.
	
	Q How can we check the answer?
	
	Discuss equivalent calculations that could be used to check the answer.
	
	• Extend the problem by asking: If each sticker costs 10p and there are 4 spaces on each page, how much pocket money would John need to fill two pages?
	
	In pairs ask children to work out how much pocket money would be needed to fill
	
	    4 pages
	    8 pages
	    12 pages
	
	Ask children to record their answers using £ and p symbols.
	
	Collect answers and correct errors.
	
	• Set similar questions for children to complete using the problem solving process.

VOCABULARY estimate inverse calculate calculation check	

Plenary

Teaching Activities / Focus Questions
Q How can we check our answers? Ask for different methods of calculation, checking that they will arrive at the same answer. For example, 4 stickers $\times$ 10p = 40p 40p $\times$ 4 pages   = £1.60 4 pages $\times$ 4 stickers = 16 10 $\times$ 10p = £1.00 6 $\times$ 10p = £0.60 16 $\times$ 10p = £1.00 + £0.60   = £1.60
By the end of the lesson children should be able to: • **Use written methods to calculate simple multiplication problems including money;** • **Recall multiplication facts in the 4 times table and derive division facts.** (Refer to supplement of examples, section 6, pages 58 and 84.)

Planning sheet	Day Two	Unit 10 *Money and real life problems*	Term: *Autumn*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities

Main Teaching

Objectives and Vocabulary	Teaching Activities

Plenary

Teaching Activities / Focus Questions

Oral and Mental

Objectives and Vocabulary

Multiply and divide whole numbers by 10 and 100.

Teaching Activities

- Ensure children understand that when multiplying numbers by 10 / 100 the digits move 1 place / 2 places to the left and that when dividing numbers by 10 / 100 the digits move 1 place / 2 places to the right.

Ask children to record answers to the following questions on whiteboards.

Q What is 46 multiplied by 10?

Q How many 10s are there in 900?

Q Share 760 between 10.

Q How many groups of 10 are there in 640?

Q What are 100 lots of 36?

Q What is the product of 72 and 100?

Q Share 9000 between 100.

Q How many 100s are there in 6000?

- Draw out teaching points on the movement of digits when multiplying and dividing by 10 and 100.

VOCABULARY
grouping
sharing equally
divide
product
multiple

RESOURCES
Whiteboards

Main Teaching

Objectives and Vocabulary

Use pencil and paper methods to divide.

Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps.

Explain and record methods.

Check with equivalent calculation.

VOCABULARY
estimate
calculate
calculation
check

Teaching Activities

- Present a problem where division is needed to find the answer, e.g.

Sam has 78 photos to put into his album. He can fit 4 on a page. How many pages will he fill?

$$78 \div 4 = 40 + 20 + 18$$
$$= 10 + 5 + 4 \text{ remainder 2}$$
$$\text{or 19 remainder 2}$$

or

$$
\begin{array}{rl}
78 \div 4 & 78 \\
& \underline{-\ 40} \quad 10 \times 4 \\
& 38 \\
& \underline{-\ 20} \quad 5 \times 4 \\
& 18 \\
& \underline{-\ 16} \quad 4 \times 4 \\
& 2
\end{array}
$$

Answer: 19 remainder 2

Ensure children can apply the problem solving process used in Day 1.

Ask children to work in pairs to solve the problem.

Collect responses and discuss methods of calculation.

Q How many pages will Sam fill?

Establish that Sam will fill 19 pages.

- Set further problems involving division, including money.

Plenary

Teaching Activities / Focus Questions

- Compare 2 problems, one needing division and one needing multiplication.

Q What operation do you need to use?

Q How do you know this?

- Establish links to vocabulary and an understanding of the problem.

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

- **Multiply by 100 and link with the associated division fact;**
- **Apply written methods for division to solve simple real life problems including money;**

(Refer to supplement of examples, section 6, page 6, 64 and 82.)

Planning sheet	Day Three	Unit 10 *Money and real life problems*	Term: *Autumn*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Recall multiplication facts in 3 and 5 times tables and derive division facts. Recognise and extend number sequences.	• Use Counter on the computer or the constant function on the OHP calculator to count in 3s. Count in time with the numbers on the screen. Ask questions such as: **Q** What will the next 3 numbers be? **Q** How many 3s are there in this number? • Use related vocabulary to ask questions such as: **Q** What is 3 multiplied by 8? **Q** What is the product of 3 and 9? **Q** What multiple of 3 gives 42? **Q** Divide 72 by 3. **Q** What are the next two numbers in the sequence 9 12 15 18 21 _ _ ? • Repeat with 5 times table.
VOCABULARY multiple product next sequence RESOURCES 'Counter' from NNS ICT pack or OHP calculator	

Main Teaching

Objectives and Vocabulary	Teaching Activities
Choose and use appropriate number operations and appropriate ways of calculating to solve money and 'real life' word problems with one or more steps. Explain and record methods and reasoning about numbers. Check results with an equivalent calculation.	• Remind children that in Day 1 and Day 2 they have been using $\times$ and $\div$ to solve problems. Tell children that today they will have problems to solve where they will have to choose which operation to use. Give children a selection of one- and two-step problems from Resource sheet 10.4. Ask children to work in pairs to decide which operation will be needed to solve each problem. Discuss responses and ensure children have identified the correct operation and can explain and justify their choice. Ask children to work in pairs to solve the problems. • Collect solutions and discuss calculation strategies used. **Q** Which is the most efficient calculation strategy we can use? Why? • Choose an appropriate example of a calculation. **Q** Can we use an equivalent calculation to check this? **Q** How can we do it?
VOCABULARY check discuss solve RESOURCES Whiteboards Resource sheet 10.1	

Plenary

Teaching Activities / Focus Questions

Q How can we use what we know already to help us solve a calculation?

Emphasise the importance of knowing number facts and using them to derive new facts. Write

$$3 \times 8 = \square$$

on the board. Ask children for the answer and with the class produce a web of related facts.

• Display the Resource sheet 10.1 and compare it with the children's answers. Explain the pathways for multiplication and division.

HOMEWORK – Children produce a web for one of these facts:
$5 \times 8 = \square$, $3 \times 10 = \square$, $4 \times 8 = \square$, $5 \times 6 = \square$ to display in the next lesson.

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

• **Apply written methods for multiplication and division to solve simple 'real life' problems including money;**

• **Recall multiplication facts in 3 and 5 times tables and derive division facts.**

(Refer to supplement of examples, section 6, pages 58, 82 and 84.)

Planning sheet	Day Four	Unit 10 *Money and real life problems*	Term: *Autumn*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Begin to relate fractions to division and find simple fractions such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$ of numbers or quantities.	• At the start of the lesson ask children for their webs of related facts produced for homework. • Comment on challenging and interesting examples, going through the calculation on the web and discussing the relation between different facts. • Remind children they have been multiplying by 10, 4, 5 and 3 in earlier lessons and dividing by using the multiplication facts. Ask how they would find one tenth of 20, one third of 30, one fifth of 100. Remind them that finding one quarter is the same as dividing by 4. • Ask questions like Q What is one tenth of: 100, 30, 500 …? Q What is one quarter of: 16, 32, 40 …? • Write on the board the terms quarter; $\frac{1}{4}$ tenth; $\frac{1}{10}$ etc. Extend to questions such as: Q Find $\frac{1}{5}$ (one fifth) of 30, 45, 65 … Q Find $\frac{1}{3}$ (one third) of 18, 27, 36 … At each stage ask what we divide by to find $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$ of a number or quantity. • Ask questions orally and use whiteboards asking children to record the calculation and answer to each problem. • Extend questions. Q What fraction of £1 is 10p? Q What fraction of 50p is 10p?
VOCABULARY third fifth tenth divided by RESOURCES Whiteboards	

Main Teaching

Objectives and Vocabulary	Teaching Activities

Choose and use appropriate number operations and appropriate ways of calculating to solve money and 'real life' word problems with one or more steps.
 	
Explain and record methods.
	• Pose some examples of word problems, using fraction language, to the whole class, e.g.
	
	    Kate has 32 toys. John has half as many.
	
	Q How many toys has John?
	
	    Mike had 36 sweets. He ate $\frac{1}{4}$ of them.
	
	Q How many had he eaten?
	
	Q How many had he left?
	
	    Harry spent one fifth of his money on a book.
	
	Q What did the book cost if he started with £10?
	
	• Ask children to explain their reasoning and record the appropriate calculation on the board.
	
	• Give groups of children a range of problems involving finding fractions of numbers and money.
	
	• Discuss with the children the difference between one-step and two-step problems. Write on the board a one-step problem involving money:
	
	    Gran gave me £8 of my £10 birthday money.
	
	Q What fraction of my birthday money did Gran give me?
	
	    Then a two-step problem involving money:
	
	    I spent $\frac{1}{4}$ of the money Gran gave me.
	    Next day Gran gave me the rest of my birthday money.
	
	Q How much did I have left to spend?
	
	• Work through problems and collect answers, correct any mistakes and misunderstandings.

VOCABULARY divided by 2 multiplied by 2 twice RESOURCES Resource sheet 10.2	

Plenary

Teaching Activities / Focus Questions
• Discuss examples of the problems with the children.   Include one- and two-step problems, reinforcing stages required to solve them. Q When you find a fraction of an amount, what operation do you use? Q What fractions are easy to find, and why? • Finish the lesson by playing the 'follow me' game reinforcing doubling/halving; multiplying/dividing by 2 and using terminology such as 'twice'. Resource sheet 10.2. **By the end of the lesson children should be able to:** ● **Find fractions of numbers or quantities including money;** ● **Use written methods to calculate simple number and money problems involving fractions.** (Refer to supplement of examples, section 6, pages 24, 82 and 84.)

Planning sheet	Day Five	Unit 10 *Money and real life problems*	Term: *Autumn*	Year Group: *4*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities / Focus Questions**
Recall addition and subtraction facts for each number up to 20. Recall multiplication facts for ×2, ×3, ×4, ×5, ×10.	• Ask some quick fire questions involving money e.g. – What is 17p subtract 9p? – What do I add to 9p to make 17p? – Give me two amounts which make 16p. – I have 3p – how much more do I need to make 18p? – How much less than 14p is 6p? – How much is 4 times 5p, 15p, 20p . . .? – How many 2 pences do I need to make 20p, 40p, 50p, £1 . . .? – How many times can I take 3 pence from 24p? – How many 5 pences do I need to make 50p, 75p, 85p, £1 . . .? – How many 10 pences make £1? – Take a 10p, a 5p and a 2p from £1. • Give out the 'follow me' cards (Resource sheet 10.3). Work through the questions and answers with the whole class. Play the game twice.	Choose and use appropriate number operations and appropriate ways of calculating to solve money and 'real life' word problems with one or more steps. Explain and record methods and reasoning about numbers. Check results with an equivalent calculation.	• Display the information on Activity sheet 10.1. Emphasise the importance of recording the stages in the calculation and checking results make sense. • Collect answers and correct misconceptions. Ask pairs of children to use the information on the sheets to make up a one-step and a two-step problem. Gather problems and get others in the class to solve the problems.	• Select some specific problems involving each of the 4 operations and those using more than one operation and/or steps. Share examples of effective recording which show how the problems were tackled. Q Are there other ways of doing this calculation that would help us to check our answer? Q What helpful strategies have we used to solve problems? • Create a class poster of helpful problem-solving strategies. **By the end of the lesson children should be able to:** ● **Explain and record their methods of solving problems with more than one step;** ● **Recall multiplication and division facts for ×2, ×3, ×4, ×5, ×10.** (Refer to supplement of examples, section 6, pages 58, 82 and 84.)
VOCABULARY amount value ('Follow me' game) RESOURCES Resource sheet 10.3		VOCABULARY solve calculate RESOURCES Activity sheet 10.1		

$15 \times 4 = 60$

$240 \div 3 = 80$

$80 \times 3 = 240$

$15 \times 8 = 120$

$8 \times 3 = 24$

$30 \times 8 = 240$

$3 \times 8 = 24$

$240 \div 8 = 30$

$24 \div 8 = 3$

$24 \div 3 = 8$

$12 \div 4 = 3$

$12 \div 3 = 4$

$6 \div 2 = 3$

$240 \div 16 = 15$

$24 \div 4 = 6$

$24 \div 6 = 4$

$24 \div 2 = 12$

$24 \div 12 = 2$

Double 4	10

Half of 14	26

Half of 12	8

Double 9	7

10+10	6

11+11	18

Double 13	20

8-4	22

Double 20	4

Twice 15	12

Half of 30	40

Half of 4	30

7+7	15

Double zero	2

Double 6	14

12+12	0

18 - 9	24

Half of six	28

Twice 8	9

Half of 50	3

Half of 22	16

Half of 2	25

Double 14	11

Double 50	1

Half of 26	100

Half of ten	13

Twice 5	5

| I have £85 | Who has half of £1? | I have 50p | Who has 20p? |

| I have four 5p coins | Who has 40p less than £1? | I have 60p | Who has a total of seven 2p coins? |

| I have 14p | Who has half of £5? | I have £2.50 | Who has double 36p? |

| I have 72p | Who has £3 subtract 75p? | I have £2.25 | Who has eight 20p coins? |

| I have £1.60 | Who has 30p less than £2.10? | I have £1.80 | Who has 45p add 85p? |

I have £1.30	Who has half of £25?

I have £12.50	Who has 23p plus £1.30?

I have £1.53	Who has 88p take away 35p?

I have 53p	Who has 46p added to 45p?

I have 91p	Who has 15p + 22p + 30p?

I have 67p	Who has 50p less than £5.20?

I have £4.70	Who has coins to the value of a £5 note?

I have three £1 coins and four 50p coins	Who has £1.70 added to £1.30?

I have £3	Who has £100 subtract £15?

Coconut Shy	**50p**
Big Wheel	Adult **£2.50**
	Child **£1.50**
Hoop-la	**75p**
Dodgems	Adult **£1.50**
	Child **80p**

1. Nigel pays for the Coconut Shy and the Hoop-la. How much does this cost? His sister prefers two rides on the Dodgems. Who spends the most?

2. Nigel's parents ride on the Big Wheel. Have they enough money with £10?

3. How many rides can an adult have on the Dodgems for £55?

4. An adult and two children have £10. Plan their day.

A full jug holds 3 litres. A full glass holds $\frac{1}{4}$ litre. How many glasses full of water will the jug fill?

I bought 3 boxes of chocolates at £4.99 each. What was my change from £20?

There are 4 boxes of CDs. 3 boxes each have 12 CDs, but the fourth box only has 8. How many CDs altogether?

A postcard costs 23p. A pack of 10 costs £1.99. How much do I save if I buy a pack instead of 10 single postcards?

How much do a £1.80 burger and £1.10 chips cost altogether?

A computer game costs £19.50. I only have £13. How much more money do I need?