

UNIT 9 *Fractions and Percentages*

Activities

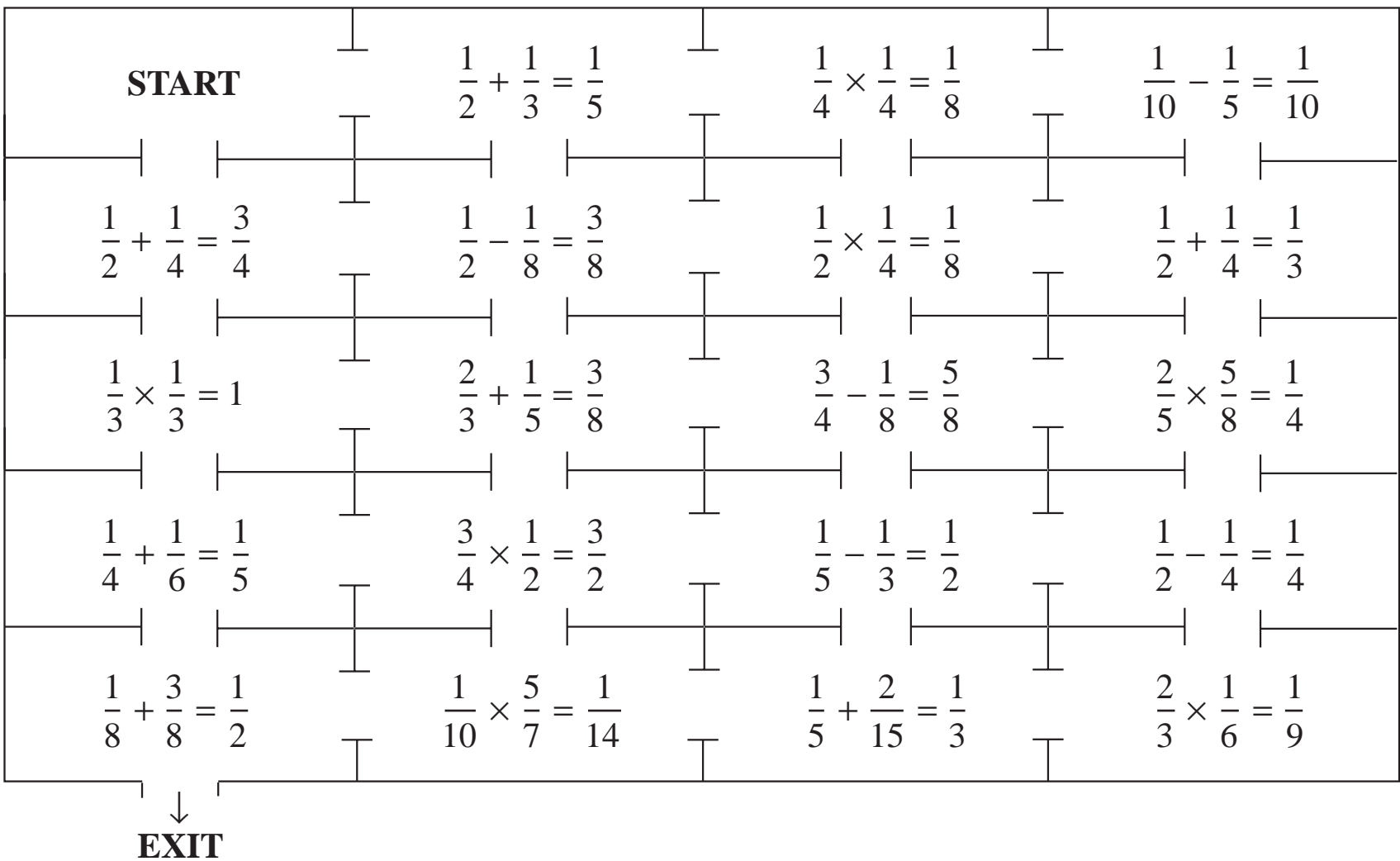
Activities

- 9.1 Fractions Revisited
- 9.2 Investments
- 9.3 Percentage Opinions
- 9.4 Currency Exchange
- 9.5 VAT Problems
- Notes and Solutions (2 pages)

ACTIVITY 9.1

Fractions Revised

Look at the diagram below. START from the top left box and enter the next box which displays a correct statement. Carry on in the same manner until you EXIT.



ACTIVITY 9.2

Investments

Ben is given £50 on his birthday. He decides to invest this money in a building society. Every year the building society adds 8% interest to the amount of money in his account at the beginning of that year.

1. Work out how much money Ben will have in his account after 5 years, giving your answer to the nearest pence.

Ben looks at the effect that interest rates have on the amount of interest he receives.

2. Copy and complete the following table:

		<i>Interest Rate</i>			
		5%	10%	15%	20%
<i>Years Invested</i>	0	£50.00	£50.00	£50.00	£50.00
	1		£55.00		£60.00
	2	£55.13			
	3				
	4				
	5				

Give your answers to the nearest pence.

3. Calculate the percentage increase in value over the 5 years for each interest rate, giving your answer to the nearest percent.
4. Comment on your results.

ACTIVITY 9.3

Percentage Opinions

The activity is about expressing the class's opinion on topical matters. Pose a number of questions to the pupils and see how many hold that opinion. When the results have been collated, pupils can calculate percentages and may wish to express results on posters. It may be possible to compare results with another class.

Some possible questions:

	YES	% YES
1. <i>Do you think that Tony Blair will be Prime Minister after the next election?</i>	<input type="checkbox"/>	<input type="checkbox"/>
2. <i>Should smoking be banned in all public places?</i>	<input type="checkbox"/>	<input type="checkbox"/>
3. <i>Should hunting with hounds be banned?</i>	<input type="checkbox"/>	<input type="checkbox"/>
4. <i>Should more money be spent to improve public transport?</i>	<input type="checkbox"/>	<input type="checkbox"/>
5. <i>Should cars be banned from city centres?</i>	<input type="checkbox"/>	<input type="checkbox"/>
6. <i>Do you think that England will win the football European Cup?</i>	<input type="checkbox"/>	<input type="checkbox"/>
7. <i>Should children be encouraged to eat healthy foods?</i>	<input type="checkbox"/>	<input type="checkbox"/>
8. <i>Should the UK remain in the European Community?</i>	<input type="checkbox"/>	<input type="checkbox"/>
9. <i>Should more money be spent on computers for schools?</i>	<input type="checkbox"/>	<input type="checkbox"/>
10. <i>Should the dropping of litter be banned in this school?</i>	<input type="checkbox"/>	<input type="checkbox"/>

There are many more and those that are particularly current can act as catalysts for some stimulating exchanges. Current news from www.bbc.co.uk and www.channel4.com

ACTIVITY 9.4

Currency Exchange

The chart shows the exchange rate between the pound and various foreign currencies on 20 December 1999.

THE £ ABROAD		
Australia	A \$	2.47
Canada	C \$	2.28
France	F Fr	10.24
Germany	DM	3.05
Hong Kong	HK \$	12.21
Ireland	IR£	1.23
Italy	L	3021.00
Japan	Y	160.34
Spain	Pes	259.66
Switzerland	S Fr	2.51
U.S.	\$	1.57

- How many:
 - \$ can you obtain for £10,
 - DM can you obtain for £5,
 - A\$ can you obtain for £20,
 - L can you obtain for £2.50?

You can also use the table for converting foreign currency to pounds.

- How many pounds can you obtain for:
 - 24 F Fr
 - 47 DM
 - 101000 L
 - 100 \$
 - 4000Y? Give your answers for (a) to (e) to the nearest pence.

In practice, most currency exchanges charge commission, either a percentage or a fixed amount; that is, the total exchange is calculated from which the percentage commission is deducted.

- Use the table to work out how much you can obtain for £200 in:
 - \$ with a commission charge of 2%,
 - DM with a commission charge of 1.5%,
 - F Fr with a fixed commission charge of £2.50.

Extension

Banks have different rates for buying and selling foreign currency, as well as commission charges.

MEP BANK		
	BUY	SELL
£1	3.14 DM	3.02 DM
Commission charge	3%	2%

- How many DM do you get for £1000 at the *MEP Bank*? (Use selling rates.)
- After changing your £1000 into DM, you find that your trip is cancelled.
 - How many pounds do you get back, using the buying and commission rates shown opposite?
 - How much money have you lost? What is the percentage loss that you have made?

ACTIVITY 9.5

VAT Problems

In the UK most articles are sold at the basic price plus

Value Added Tax (VAT) of $17\frac{1}{2}\%$.

Some goods such as cars and fuel, have an extra tax, whilst others such as food and children's clothes are exempt from VAT.

For example, a portable music centre of basic price £200, will also have VAT of

$$£200 \times \frac{17.5}{100} = £35 \text{ added to give}$$

a total price of £235.

Finding the VAT to be charged using a calculator is relatively straightforward. However, even *without* a calculator, VAT is easy to find by calculating 10%, 5% and $2\frac{1}{2}\%$, and then adding them up.

So, for £200, we have	10% → £ 20	
	5% → £ 10	(divide by 2)
	$2\frac{1}{2}\%$ → £ 5	(divide again by 2)
	$17\frac{1}{2}\%$ → £ 35	(add up)

1. *Without* using a calculator, find the VAT to be added for articles at a basic price of:

- (a) £120 (b) £80 (c) £500.

Businessmen and companies can often claim back VAT. For example, if the total price is £235, they can claim back £35.

2. What is the VAT when the total price is:

- (a) £117.50 (b) £470 ?

Extension

Remember that £17.50 is the VAT part of a total price of £117.50.

- (a) What is the VAT part of a total price of £1.00?
- (b) What is the VAT part of a total price of £ x ?
- (c) Explain why dividing the total price by 6.71 approximately gives the VAT.
- (d) Give the value of the divisor (correct to 5 significant figures), which should be used for more accurate calculations.

ACTIVITIES 9.1 - 9.3

Notes for Solutions

Notes and solutions given only where appropriate.

9.2 1. £73.47

2.

		Interest Rate			
		5%	10%	15%	20%
Years Invested	0	£50.00	£50.00	£50.00	£50.00
	1	£52.50	£55.00	£57.50	£60.00
	2	£55.13	£60.50	£66.13	£72.00
	3	£57.88	£66.55	£76.04	£86.40
	4	£60.78	£73.21	£87.45	£103.68
	5	£63.81	£80.53	£100.57	£124.42

$$3. \quad \text{Percentage increase for 5\%} = \frac{63.81 - 50}{50} \times 100$$

$$= 28\%$$

$$\text{Percentage increase for 10\%} = \frac{80.53 - 50}{50} \times 100$$

$$= 61\%$$

$$\text{Percentage increase for 15\%} = \frac{100.57 - 50}{50} \times 100$$

$$= 101\%$$

$$\text{Percentage increase for 20\%} = \frac{124.42 - 50}{50} \times 100$$

$$= 149\%$$

4. The higher the rate, the more interest is added, but at a faster rate. For example, if the interest rate is doubled, the total interest earned is more than doubled.

ACTIVITIES 9.4 - 9.5

Notes for Solutions

- 9.4** 1. (a) 15.7 \$ (b) 15.25 DM (c) 49.4 A\$ (d) 7552.5 L
2. (a) £2.34 (b) £15.41 (c) £33.43 (d) £63.69 (e) £24.95
3. (a) 307.72 \$ (b) 600.85 DM (c) 2022.4 F Fr

Extension

- (a) 2959.6 DM (b) (i) £914.27 (ii) £85.73; 8.57%

- 9.5** 1. (a) £21 (b) £14 (c) £87.50
2. (a) £17.50 (b) £70

Extension

- (a) £0.1489 (b) £0.1489x (d) 6.7143