

Unit 4

- 1 If it's a whole number, you're done,
It's divisible by **one**.
- 2 If it's even, it's true
It's divisible by **two**.
- 3 Add the digits to see
If it's divisible by **three**.
- 4 Divide the last two digits by four,
And you'll get **four** for sure.
- 5 If it ends with five or zero,
It makes **five** a hero.
- 6 If you got two and three
You get **six** for free!
- 9 Add the digits, that's fine
To check on the **nine**.
- 10 A zero at the end
And we'll feel good about **ten**.

Memorize each and every single rule,
And you'll feel even better about coming to school.

Divisibility Rules

Used to

- Find a common factor/greatest common factor (a whole number that will divide into another whole number without a remainder) **Page#**
- Determine whether a number is prime (a number with exactly two factors) or a composite (a number with more than two factor) **Page#**
- Simplify fractions $\frac{25}{100}$
- Do whole number and decimal division **Page#**
- Simplify probability, proportions, and ratios **Page#**

Practice:

Use the poetry to test the number 5622

	Work	Divisible?
1	it is a whole number	yes
2	it is even	yes
3	$5+6+2+2 = 15$ $3 \overline{)15}$ $11 + 4 = 15$	yes
4	$4 \overline{)22}$ $\underline{05}$ 26 $\underline{2}$ remainder	no
5	doesn't end with a 5 or a 0	no
6	It is divisible by 2 and 3	yes
9	$5+6+2+2 = 15$ $9 \overline{)15}$ $\underline{9}$ remainder	no
10	no zero at the end	no

Ratios and Proportions

Ratio: A way of comparing two or more quantities

Example: Ratio of flour to butter in a recipe is 500g:250g

Simplifying Ratios

*****When you simplify a ration you must make sure that all the quantities are in the same unit!**

Example 1:

Simplify the Ratio of flour to butter 500g: 250g. (Find common factors)

$$500:250$$

$$\div 250 \quad \div 250$$

$$2:1$$

Example 2:

What is the simplified ratio of oranges to sugar? 750g:1500g

$$750:1500$$

$$\div 250 \quad \div 250$$

$$3:6$$

$$\div 3 \quad \div 3$$

$$1:2$$

Practice:

Simplify these ratios

$$\div 4 \quad \div 4$$

a. 12:20 \rightarrow 3:5

$$\div 6 \quad \div 6 \quad \div 6$$

b. 12:30:24 \rightarrow 2:5:4

$$\div 50 \quad \div 50$$

c. 200 cm:50 cm \rightarrow 4:1

Example 3

- Work out the answer to each question by yourself.
- Compare your answer given by the other members of your group
- Show work on designated board

Homework! #1 and #2 Page 141

Sharing in a ratio

Alan, Bob, and Chris buy a painting for \$600. How much do they each pay if their ratios are $2:3:1$ RATIO $Quantity$

1. Set up the ratio and simplify	$2:3:1$
2. Add all the numbers in the ratio to find the total number of parts	$\begin{array}{c} \diagdown \quad \quad / \\ 6 \end{array}$
3. Divide the quantity by the answer in step two`	$6 \overline{) \$600} = 100$
4. Multiply each ratio by the answer in step three	$2 \times 100 \quad 3 \times 100 \quad 1 \times 100$ $\$200 \quad \$300 \quad \$100$
Check! All the shares should equal the original quantity	$\begin{array}{c} \diagdown \quad \quad / \\ \$600 \end{array}$

Every year, David shares ^{quantity} \$300 among his grandchildren in the ratio of their ages.

The grandchildren are 5, 12, 15, and 18 years old.

How much does each of them receive?

1. Set up the ratio and simplify	$5 : 12 : 15 : 18$
2. Add all the numbers in the ratio to find the total number of parts	$5 + 12 + 15 + 18 = 50$
3. Divide the quantity by the answer in step two	$50 \overline{) \$300} \rightarrow \6 ^{1 Ratio}
4. Multiply each ratio by the simplified ratios (step one)	$5 \times 6 = 30$, $12 \times 6 = 72$, $15 \times 6 = 90$, $18 \times 6 = 108$
Check! All the shares should equal the original quantity	$30 + 72 + 90 + 108 = \$300$

Practice:

Example #1: Share these amounts between Andi, Beth, and Charlie in the given ratios.

Quantity
a. \$90 in the ratio 1:2:3

1. Set up the ratio and simplify	$1 : 2 : 3$
2. Add all the numbers in the ratio to find the total number of parts	$\begin{array}{c} \diagdown \quad \quad / \\ 6 \end{array}$
3. Divide the quantity by the answer in step two	$\begin{array}{r} 15 \\ 6 \overline{)90} \\ \underline{6} \\ 30 \end{array} \rightarrow 1 \text{ Ratio} = \15
4. Multiply each ratio by the simplified ratios (step one)	$\begin{array}{ccc} 1 \times 15 & 2 \times 15 & 3 \times 15 \\ \$15 & \$30 & \$45 \end{array}$
Check! All the shares should equal the original quantity	$\begin{array}{c} \diagdown \quad \quad / \\ \$90 \end{array}$

b. \$225 in the ratio 2:3:4

c. \$432 in the ratio 3:5:1

d. \$369 in the ratio 4:2:5

Direct Proportion

A direct proportion is when one increases or decreased then so does the other, *in the same ration*.

Example #1:

2 Tickets for a concert cost \$25 each

If I buy 2 tickets the cost will be twice as much: $2 \times 25 = \$50$

If I buy 3 tickets the cost will be three times as much: $3 \times 25 = \$75$

Steps:

Example #2:

Eight folders cost \$16. Work out the cost of 5 folders.

of folders total # asked for

Step 1: Use division to find the cost of 1 item.

Total/Larger number is the numerator $\frac{16}{8} = \$2$
Number of items/Smaller numbers is the denominator

1 Folder = \$2 dollars

Step 2: Use multiplication to work out the cost/total asked for.

$$\$2 \times 5 = \$10$$

Example #2:

Four pens cost \$2, what is the cost of 1 pen, 3 pens, and 10 pens?

of pens total

Step 1: Use division to find the cost of 1 item.

$$\frac{2 \div 2}{4 \div 2} \rightarrow \frac{1}{2} \rightarrow 2 \overline{) 1.00} \rightarrow 0.50$$

one pen =
¢50 cents

Step 2: Use multiplication to work out the cost/total asked for.

$$1 \times .50 = .50$$

$$3 \times .50 = 1.50$$

$$10 \times .50 = 5.00$$

Practice: The cost of two cups of coffee is \$3. Work out the cost of:

- a) 1 cup
- b) 5 cups
- c) 7 cups

Problems w/direct proportion and ratios

Example #1: A fruit drink contains orange juice and mango juice in the ratio 2:3. There are 500ml of orange juice in the drink.

a. How much mango juice is there in the drink?

Step 1: Divide the quantity given (ml) by the corresponding ratio (orange juice)

$$\frac{500\text{ml}}{2} = 250\text{ml} \quad | \text{Ratio} = 250\text{ml}$$

Step 2: Multiply the second ratio by the answer in step one

b. How much drink is there altogether?

$$250 \times 3 = 750\text{ml}$$
$$250 + 750 = 1000\text{ml}$$

#5: A fruit dessert contains raspberries and strawberries in the ratio 1:2. There are 400g of strawberry dessert.

a. How many grams of raspberry are in the dessert?

Step 1: Divide the quantity given (g) by the corresponding ratio (strawberry)

$$\frac{400\text{g}}{1} = 400\text{g} \quad | \text{Ratio} = 400\text{g}$$

Step 2: Multiply the second ratio by the answer in step one

$$400 \times 2 = 800\text{g}$$

b. How much fruit is there altogether in the dessert?

$$400 + 800 = 1200\text{g}$$