

## *Model Answers:*

# Rules for Dividing Whole Numbers

This worksheet has questions about the rules concerning the division of whole numbers.

Rules for Dividing  
Whole Numbers  
study guide



1. Taking each divisibility rule in turn:

Dividing by 2: All even numbers, those ending in 2, 4, 6, 8 or 0, are divisible by 2. So from the list, (a) 100, (d) 68, (f) 56 (g) 84 and (h) 84 692 are divisible by 2.

Dividing by 3: Sum the digits and if the sum is divisible by 3, then the number is also divisible by 3. So from the list (b) 105 whose digits sum to 6, (c) 45 whose digits sum to 9 and (g) 84 whose digits sum to 12 are all divisible by 3.

Dividing by 5: Numbers ending in 5 or 0 are divisible by 5. So from the list (a) 100, (b) 105, (c) 45 and (e) 55 are divisible by 5.

Dividing by 8: To determine if a number is divisible by 8, divide it by 2 twice and if the result is divisible by 2 (i.e. even) then the number is divisible by 8:

- (a) 100 divided by 2 is 50, 50 divided by 2 is 25 which is odd and so 100 is not divisible by 8.
- (b) 105 is not divisible by 2, and so is not divisible by 8.
- (c) 45 is not divisible by 2, and so is not divisible by 8.
- (d) 69 divided by 2 is 34, 34 divided by 2 is 17 which is odd and so 69 not divisible by 8.
- (e) 55 is not divisible by 2, and so is not divisible by 8.
- (f) 56 divided by 2 is 28, 28 divided by 2 is 14, which is even and so 56 is **divisible** by 8.
- (g) 84 divided by 2 is 42, 42 divided by 2 is 21 which is odd and so 84 is not divisible by 8.

- (h) 84692 divided by 2 is 42346, 42346 divided by 2 is 21173 which is odd and so 84692 is not divisible by 8.

The only number divisible by 8 is (h) 56.

2. You need to check whether each number is divisible by 3, 4 or 5.

- (a) 55:  $5 + 5 = 10$ , and so 55 is not divisible by 3.  
55 is odd and so is not divisible by 2, and therefore is not divisible by 4.  
55 ends with 5, and so is **divisible by 5**  
Therefore you should suggest the students be split into **groups of 5**.
- (b) 51:  $5 + 1 = 6$ , and so 51 is **divisible by 3**.  
51 is odd and so is not divisible by 2, and therefore is not divisible by 4.  
51 ends with 1, and so is not divisible by 5.  
Therefore you should suggest the students be split into **groups of 3**.
- (c) 56:  $5 + 6 = 11$ , and so 56 is not divisible by 3.  
56 divided by 2 is 28, 28 is even and so 56 is **divisible by 4**  
56 ends with 6, and so is not divisible by 5.  
Therefore you should suggest the students be split into **groups of 4**.
- (d) 60:  $6 + 0 = 6$ , and so 60 is **divisible by 3**.  
60 divided by 2 is 30, 30 is even and so 60 is **divisible by 4**  
60 ends with 0, and so is **divisible by 5**.  
Therefore you should suggest the students be split into **groups of either 3, 4 or 5**.

3. To spend the money precisely you need to work out which of the amounts is divisible by 7.

- (a) £95: The last digit of 95 is 5, double it and subtract it from 9 to give  $9 - 10 = -1$  which is not divisible by 7 and so 95 is not divisible by 7.
- (b) £100: The last digit of 100 is 0, double it and subtract it from 10 to give  $10 - 0 = 10$  which is not divisible by 7 and so 100 is not divisible by 7.

- (c) £81: The last digit of 81 is 1, double it and subtract it from 8 to give  $8 - 2 = 6$  which is not divisible by 7 and so 81 is not divisible by 7.
- (d) £91 The last digit of 91 is 1, double it and subtract it from 9 to give  $9 - 2 = 7$  which is **divisible by 7** and so you can divide £91 evenly between your 7 friends.

4.

Dividing by 6: All numbers that are both **even and divisible by 3** are divisible by 6. The even numbers are, (b) 7168, (c) 9742, (d) 352 (e) 270 and (g) 546. From these only (e) 270 whose digits sum to 9 and (g) 546 whose digits sum to 15 are divisible by 3 and so 270 and 546 are divisible by 6.

Dividing by 9: Sum the digits and if the sum is divisible by 9, then the number is also divisible by 9. So from the list (e) 270 whose digits sum to 9 and (f) 819 whose digits sum to 18 are divisible by 9.

Dividing by 10: Numbers ending in 0 are divisible by 10. So from the list only (e) 270, is divisible by 10.

Dividing by 11: Alternately add and take away the digits. If the result is divisible by 11, then the number is also divisible by 11. So from the list only (d) 352 whose digits alternate sum is  $3 - 5 + 2 = 0$  is divisible by 11. It is important to remember that 0 is part of every times table and so is divisible by every number.



These model answers are one of a series on mathematics produced by the Learning Enhancement Team.

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