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IrishMaths Series

PHOTOCOPY MASTERS

Maths: 5th Class

- number and algebra
- measurement and geometry
- statistics and probability

5

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Contents

Teachers' Notes

This book is part of the *IrishMaths Series* which consists of seven books altogether. The activities in this book allow the students to both investigate and practise a range of mathematical concepts. Student-friendly explanations of relevant concepts are included on the majority of pages. Answers are provided at the back of the book.

This book is divided into three sections, which are detailed below.

Section 1: Number and Algebra
The activities in this section cover important skills concerning division and multiplication, allowing the students to work with factors, multiples and a range of different multiplication methods. Activities involving fractions, decimals and money calculations are also included.

Section 2: Measurement and Geometry
In this section, students will explore how to choose appropriate measurement units and will work with 12 and 24 hour time. They will also investigate concepts concerning 2D and 3D shapes, use a grid reference system, calculate perimeter and area, and construct and measure angles using protractors.

Section 3: Statistics and Probability
This section allows students to investigate three different games of chance, develop an understanding of probability, and construct and interpret graphs and tables.

Section 1:
Number and Algebra

Investigating Factors

Factors are whole numbers that you can multiply together to make another number.

For example, the factors of 12 are 1, 2, 3, 4, 6 and 12 because:

1 x 12 = 12 **2 x 6 = 12** **3 x 4 = 12**

Some numbers have many factors while some only have two: 1 and the number itself.

Complete these questions about factors.

1. Write the missing factors for these numbers to complete each sequence.

a. 10: 1, 2, 5, ___

b. 28: ___, 2, 4, ___, 14, ___

c. 9: 1, _____

d. 13: 1, _____

2. Complete the quiz about your answers to question 1.

a. Which number had the least factors? _____

b. Which number/s were common to all? _____

c. What differences do you notice about the factors for odd and even numbers?

_____

3. Write the factors for each number below as an ascending sequence, then draw lines between any factor pairs. An example has been done for you.

a. 20 1, 2, 4, 5, 10, 20

b. 16 ___, ___ , ___, ___, ___

c. 81 ___, ___ , ___, ___

d. 42 ___, ___ , ___, ___, ___, ___ , ___, ___

4. Circle the factors in each sequence below for the number indicated, then write which factors are missing.

a. 25: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23
Factor missing: ___

b. 100: 4, 10, 16, 22, 28, 34, 40, 46, 52, 58, 64, 70
Factors missing: ___, ___, ___, ___, ___, ___, ___, ___

c. 63: 1, 7, 13, 19, 25, 31, 37, 42
Factors missing: ___, ___, ___

d. 90: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
Factors missing: ___, ___, ___, ___, ___, ___,

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Investigating Multiples

Multiples are closely related to factors. The multiples of a number are all the numbers in its times table.

For example, the multiples of 10 are 10, 20, 30, 40, 50, 60, 70 and so on.

The amount of multiples for any number is, in fact, endless!

Complete these questions about multiples.

1. Each sequence below shows some of the multiples of a mystery number. Write the number in the box next to each sequence.

a. 3, 6, 9, 12, 15, 18 Mystery number: ☐

b. 14, 21, 28, 35, 42 Mystery number: ☐

c. 26, 39, 52, 65, 78 Mystery number: ☐

2. Circle the multiples of 5 in each sequence below.

a. 5, 8, 11, 14, 17, 20, 23, 26, 29, 32

b. 10, 17, 24, 31, 38, 45, 52, 59, 66, 73

c. 3, 6, 9, 12, 15, 18, 21, 24, 27, 30

3. Which numbers in the sequence below are multiples of 4 and 6? Circle them in two different colours: red for multiples of 4 and blue for multiples of 6.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

Comment on any common numbers or patterns that you notice.

_____

4. Fill in the missing multiples of each number below to make a sequence.

a. 9: 9, 18, 27 ___, ___, ___, ___, ___,

b. 8: 8, ___, ___, ___, 40, ___, ___, 64, 72, ___

c. 11: 22, ___, ___, 55, ___, ___, 88, 99, ___

Is It Divisible?

If one number can be divided evenly by another number, we say it is divisible by that number. For example, 24 is divisible by 2 because it divides evenly into 24 exactly 12 times. However, 25 is not divisible by 2 because there is a remainder of 1.

It is useful to remember that any number is always divisible by its factors.

There are also rules about divisibility. These help you to understand quickly whether a number is divisible by another. Look at the divisibility rules on the right.

Divisibility Rules

1. A number is divisible by 2 if the last digit is an even number. For example, 12, 256, 1078.
2. A number is divisible by 3 if the sum of the digits is divisible by 3. For example, 30, 669, 5715.
3. A number is divisible by 4 if the last two digits are divisible by 4. For example, 24, 916, 7020.
4. A number is divisible by 6 if the number is divisible by both 2 and 3. For example, 60, 132, 402.

Study each number below. Use the divisibility rules above to say which numbers they are divisible by. It may be more than one of them! Explain how you worked out each one.

Number	Divisible by	How I worked it out
a) 225		
b) 1078		
c) 6534		
d) 19036		
e) 15681		
f) 212122		

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Divisibility Rules

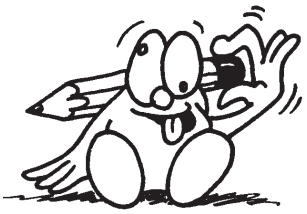
Find a partner to work with to answer these questions. Try to figure out some possible divisibility rules for each of the numbers below.

Hint: You can think about the divisibility rules given on page 8 to help you. You should also look for any patterns that you can see.

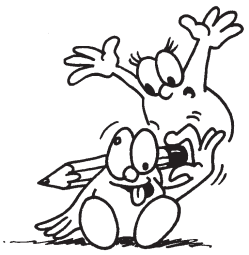
1. 15, 20, 105 and 200 are all divisible by 5. What might the divisibility rule for this number (5) be?

2. 9, 18, 27 and 900 are all divisible by 9. What might the divisibility rule for this number (9) be?

3. 10, 30, 60 and 2000 are all divisible by 10. What might the divisibility rule for this number (10) be?



4. 12, 72, 120 and 600 are all divisible by 12. What might the divisibility rule for this number (12) be? (Hint: Figure out two other smaller numbers these numbers are also divisible by.)



Using Estimation

In Mathematics, estimation means to calculate an approximate answer. This does not mean that you make a wild guess; rather, you use logic to come up with an answer that is close to the real answer. In everyday life, estimation can help you to quickly work out such things as how much items for sale cost, how long something might take or the size of an object.

There are many ways to estimate. Different situations may require different methods.

Here are a few mental estimating methods that you can use:

- Rounding numbers up or down to make them easier to work with (for example, to work out 483 + 96, you could round the numbers up to make 500 + 100).
- Looking at the first digit of each number (for example, to work out 2755 + 5618, add 2000 and 5000, then look at the rest of the numbers: 755 and 618 is about 1300).
- Grouping particular numbers together that will be easier to work on (for example, to work out 156 + 822 + 45, you could group 156 and 45 together, as they make approximately 200, then add the 822).

Answer the questions about estimation.

1. Explain two ways when estimating could be useful during a trip to the supermarket.

_____

_____

2. Use mental calculation to estimate answers to the number problems below. Under each, explain the estimation strategy you used. It may or may not be one of the methods above.

a. Tom has been given €100 for his birthday. He wants to spend it on some DVDs. He is looking at 5 DVDs, which each cost €11.95, €18, €12.80, €10 and €40. Does he have enough money? If so, approximately how much change will he get?

b. A school is planning on holding a musical recital by its students. It hires out a local hall with a capacity of 950 people. Tickets are sold through four different community groups. The groups sell 523 tickets, 59 tickets, 241 tickets and 78 tickets. Approximately how many tickets have been sold so far? Approximately how many more tickets can be sold?

c. A university student is about to take a 4 hour exam. There are six parts to the exam. She takes 40 minutes to do the first part, 32 minutes to do the second part, 33 minutes to do the third part, 1 hour to do the fourth part and 21 minutes to do the fifth part. Approximately how much longer does she have to complete the last part? (Hint: You may need to convert from minutes to hours or vice versa to work out this problem.)

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Multiplication Methods: Partitioning Numbers

When we multiply with large numbers, we can use a method called partitioning to make the numbers easier to work with. To use partitioning, all you need is a good understanding of your times tables, as well as how to multiply by multiples of 10. Here is an example of how to solve a multiplication problem by partitioning:

908 x 7

We first work out: → 900 x 7 = 6300

Then work out: → 8 x 7 = 56

Then add these two numbers together to find the answer to the problem: → 6300 + 56 = <u>6356</u>.

Use the partitioning method to work out these multiplication questions. The first one has been done for you.

1. 512 x 6

500 x 6 = 3000

12 x 6 = 72

3000 + 72 = 3072

2. 462 x 7

3. 771 x 8

4. 302 x 5

5. 653 x 3

6. 971 x 4

7. 219 x 9

8. 832 x 2

Multiplication Methods: Area Model

The area model is a way of working out a multiplication problem that doesn't involve an algorithm. This method uses expanded numbers (or partitioning) and boxes. For example, to work out 324 x 19, you would do the following:

	300 +	20 +	4
x 10	3000	200	40
x 9	2700	180	36

3000 + 2700 + 200 + 180 + 40 + 36 = 6156

In this example, you can see that each number has been expanded and multiplied separately. The results are then added together to provide the answer.

Use the area model to work out these multiplication questions. Look at the example above to help you.

1. 174 x 55

___ +___+___+___+___+___=____

2. 923 x 17

___ +___+___+___+___+___=____

3. 764 x 81

___ +___+___+___+___+___=____

4. 5092 x 32

___ +___+___+___+___+___=____

5. 783 x 45

___ +___+___+___+___+___=____

6. 333 x 33

___ +___+___+___+___+___=____

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