BGE S1-S3

Mathematics & Numeracy

Planning & Assessment

Third Level

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Contents

Introduction

Lesson plans

Homework

- **Chapter 1:** Number
- **Chapter 2:** Multiples, factors, powers and roots
- **Chapter 3:** Fractions, decimals and percentages
- **Chapter 4:** Ratio and proportion
- **Chapter 5:** Time
- **Chapter 6:** Measurement
- **Chapter 7:** Expressions and equations
- **Chapter 8:** Money
- **Chapter 9:** Patterns
- **Chapter 11:** Coordinates, symmetry and scale
- **Chapter 12:** Statistics
- **Chapter 13:** Angles
- **Chapter 14:** Probability
- **Answers**

Assessments

- **Chapter 1:** Number
- **Chapter 2:** Multiples, factors, powers and roots
- **Chapter 3:** Fractions, decimals and percentages
- **Chapter 4:** Ratio and proportion
- **Chapter 5:** Time
- **Chapter 6:** Measurement
- **Chapter 7:** Expressions and equations
- **Chapter 8:** Money
- **Chapter 9:** Patterns
- **Chapter 11:** Coordinates, symmetry and scale
- **Chapter 12:** Statistics
- **Chapter 13:** Angles
- **Chapter 14:** Probability
- **Answers**

Block Tests and Whole Course Assessments

- Block Test 1
- Block Test 2
- Block Test 3
- Block Test 4
- Whole Course Assessment Paper 1 Non-Calculator
- Whole Course Assessment Paper 2 Calculator

Introduction

Overview of resources

Within this pack you will find materials to complement the Third Level Mathematics and Numeracy Student Book. As with the student book, careful consideration has been given to include examples and contexts which promote literacy, health and wellbeing, interdisciplinary learning and Developing the Young Workforce.

Scheme of Work and Lesson Plans

The table on page 3 shows how the structure and content of the student book matches the Third Level Mathematics and Numeracy Outcomes and Benchmarks. The book is designed to be followed in the order written, however should you choose to deviate from this, the table will allow you to check that no prior learning has been missed before accessing a chapter. The number of periods allocated per chapter is based on a 50-minute period and offers an approximate guide as clearly this will vary across establishments and cohorts.

Each lesson plan contains planning information relevant to a spread in the student book. We have included details of any materials which are required for each lesson, ideas for further activities in class and reference to student book questions where applicable. These are in no way exhaustive or prescriptive but are simply small pointers towards possible active learning opportunities which may be explored within the classroom. We have also listed here Second and Fourth Level Experiences and Outcomes relevant to the spread, where applicable.

Homeworks

All homeworks, with the exception of Chapter 8, are designed to be accessible to learners without the use of a calculator. These may be delivered traditionally, electronically or as live online assessments through the Dynamic Learning platform. Answers are provided at the end of this resource.

Assessments

To inform learner progress, tracking and monitoring data may be generated through the three assessment types contained within this resource: Chapter Assessments, Block Tests and a Whole Course Assessment.

Chapter Assessments focus only on the named chapter and can be used with individual learners under strict assessment conditions or given to pairs/groups of learners to work on collaboratively. They are designed to be completed in 40 minutes and the only one that requires the use of a calculator is Chapter 8. Answers are provided at the end of this resource.

Block Tests, complete with marking instructions, have been created to monitor retention and further inform tracking and monitoring of the learner's journey through Third Level. Each test begins with basic number work before assessing material as follows:

Block Test	Chapters Assessed
1	1–3
2	4–6
3	7–11
4	12–14

Each test is designed to be completed in 40 minutes and without the use of a calculator.

Finally, the Whole Course Assessment is split into two 40-minute sections. The first is non-calculator and the second requires the use of a calculator. These assessments draw from the entire Third Level course to allow learners to demonstrate the skills and knowledge they have acquired as they have progressed through it.

We sincerely hope you enjoy using this resource alongside the student book and find it an asset in communicating the beautiful language of mathematics to learners.

Chapter	Periods	MNU 3-01a	MNU 3-03a	MNU 3-03b	MNU 3-04a	MTH 3-05a	MTH 3-05b	MTH 3-06a	MNU 3-07a	MTH 3-07b	MTH 3-07c	MNU 3-08a	MNU 3-09a	MNU 3-09b	MNU 3-10a	MNU 3-11a	MTH 3-11b	MTH 3-12a	MTH 3-13a	MTH 3-14a	MTH 3-15a	MTH 3-15b	MTH 3-16a	MTH 3-17a	MTH 3-17b	MTH 3-17c	MTH 3-18a	MTH 3-19a	MNU 3-20a	MTH 3-20b	MTH 3-21a	MNU 3-22a
1	15	✓	✓	✓	✓																										
2	8		✓	✓	✓	✓	✓	✓																							
3	16	✓	✓	✓		✓			✓	✓	✓																				
Block Test 1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																				
4	8		✓	✓					✓	✓		✓																			
5	8		✓												✓														✓		
6	12	✓	✓	✓												✓	✓						✓					✓				
Block Test 2			✓	✓	✓							✓			✓	✓	✓												✓			
7	14		✓	✓	✓			✓												✓	✓	✓										
8	10	✓	✓	✓	✓								✓	✓																		
9	6		✓	✓	✓														✓		✓	✓										
10	2		✓	✓														✓														
11	10		✓	✓	✓							✓				✓									✓	✓	✓	✓				
Block Test 3			✓	✓	✓			✓						✓					✓	✓	✓	✓					✓	✓				
12	10								✓																				✓	✓	✓	
13	12		✓																		✓		✓	✓	✓							
14	5								✓																							✓
Block Test 4			✓	✓	✓			✓	✓	✓													✓					✓		✓	✓
Whole Course Assessment																																
Paper 1		✓	✓	✓	✓	✓	✓		✓			✓	✓			✓				✓				✓					✓			✓
Paper 2		✓	✓	✓	✓		✓		✓		✓		✓	✓	✓		✓			✓	✓	✓				✓						

Chapter 6: Measurement

Chapter	Chapter objectives	Key aspects of student achievement	Key assessment opportunities
6 Measurement	**In this unit, learners will**: • Be able to convert between metric units of measurement • Learn to calculate the area of a range of shapes, extending their Level 2 knowledge to include kites, rhombi, parallelograms and trapezia • Deal with inconsistent units and multistep problems • Develop their problem-solving and communication skills to tackle compound area questions • Consolidate and test their understanding of the difference between perimeter and area • Learn to calculate the volumes of compound cuboids and prisms • Deal with inconsistent units and multistep volume and capacity problems	**Learners will demonstrate the ability to:** • Use a wide variety of area and volume formulae, selecting the correct dimensions and being able to cope with 'extra' information and inconsistent units • Solve problems in which they apply their knowledge of the area and volume of shapes • Use correct mathematical vocabulary • Interrogate problems to select information and form strategies • Manipulate numbers, using recall of multiplication and division facts. The exercises are designed to give learners the chance to apply their Level 3 non-calculator skills throughout. A differentiated classroom approach may include calculators • Consider a huge variety of applications, including engineering, product design and project costing • Each exercise has opportunities for learners to extend and challenge their thinking, select strategies and make connections	• Chapter Check-up • Chapter Homework • Chapter Assessment • Block Test 2 Q3,6,10 • Whole Course Assessment Paper 1 Q10 • Whole Course Assessment Paper 2 Q10

Lesson	Learning Intentions	Textbook Pages	Experiences and Outcomes	Third Level Benchmarks
1 Units of measurement	**In this lesson, learners will** • Be able to carry out any metric conversion, using staged practice • Extend to square and cubic units as appropriate	74–75 Exercise 6A	MNU 3-11a MNU 3-03b	• Converts between standard units to at least 3 decimal places and applies this when solving calculations of length, capacity, volume and area

Assessment Opportunities

Chapter Check-up Q6 Chapter Homework Q1 Chapter Assessment Q3(b)

Teaching Notes

A thorough understanding of how to multiply and divide by 10, 100, 1000 is necessary and will be refreshed by this exercise. Learners may enjoy measuring objects around them and presenting their findings in several different units. Groups could be given sticky notes with the length of common objects around the room in a variety of units and they need to find the objects. This can include local distances, e.g. to the local supermarket, which can go on the wall.

Lesson	Learning Intentions	Textbook Pages	Experiences and Outcomes	Third Level Benchmarks
3 The area of a parallelogram	**In this lesson, learners will** • Be able to find the area of a parallelogram • Deal with inconsistent units and extra information • Apply knowledge to solve problems in a variety of contexts • Extend to multistep problems and calculating dimensions as appropriate	80–81 Exercise 6D	MNU 3-11a MNU 3-03b	• Chooses appropriate units for length, area and volume when solving practical problems • Calculates the area of a 2D shape where the units are inconsistent

Assessment Opportunities

Chapter Check-up Q2 Chapter Homework Q2 Chapter Assessment Q1

Teaching Notes

The multistep problems Q4–10 are appropriate for paired or groupwork and learners presenting their ideas and findings to others. Q11 gives learners an opportunity to construct and handle shapes creatively having studied their properties.

Lesson	Learning Intentions	Textbook Pages	Experiences and Outcomes	Third Level Benchmarks
6 Areas of compound shapes	**In this lesson, learners will** • Be able to identify strategies and necessary dimensions to calculate a compound area successfully • Recall area formulae from throughout the chapter • Apply skills in context	86–87 Exercise 6G	MNU 3-11a MTH 3-11b MNU 3-03b	• Finds the area of compound 2D shapes constructed from squares, rectangles and triangles

Assessment Opportunities

Chapter Check-up Q8 Chapter Homework Q5 Chapter Assessment Q2

Teaching Notes

The exercise is heavily scaffolded to begin with but is particularly appropriate for paired and groupwork. As they work through, learners will enjoy sharing their strategies and solutions with each other and meeting the challenges of the later questions. Learners may enjoy creating their own compound area picture questions, possibly around a theme such as Halloween or Christmas.

Lesson	Learning Intentions	Textbook Pages	Experiences and Outcomes	Third Level Benchmarks
8 Compound volume	**In this lesson, learners will** • Be able to identify strategies and necessary dimensions to calculate the volume of compound cuboids successfully • Deal with inconsistent units • Apply their knowledge in context, extending to capacity where appropriate	90–91 Exercise 6I	MNU 3-11a MTH 3-11b MNU 3-03b	• Finds the volume of compound 3D objects constructed from cubes and cuboids

Assessment Opportunities

Chapter Check-up Q8 Chapter Homework Q3

Teaching Notes

Learners may enjoy bringing in packaging, looking at a selection of real examples and calculating their volume. They can also compare the volume of the product inside and consider unused space. The exercise is suitable for paired and groupwork throughout. Shipping containers and cargo ship capacity is an interesting investigation. Learners find out about the utility of different packaging shapes and are interested in the scale of the numbers involved in international shipping.

6 Measurement: Homework

1. Convert these measurements to the units shown in brackets.

(a) 5 cm (mm)

(b) 2 km (m)

(c) 9·5 litres (ml)

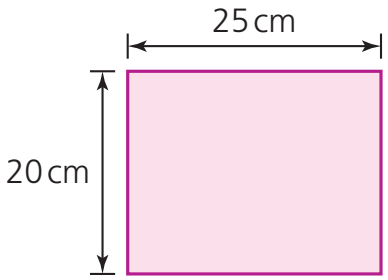
(d) 3750g (kg)

(e) 10 mm (m)

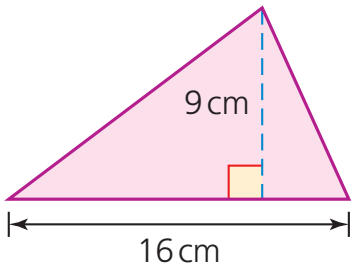
(f) 4·5 m

2. Calculate the area of each shape.

(a)



(b)



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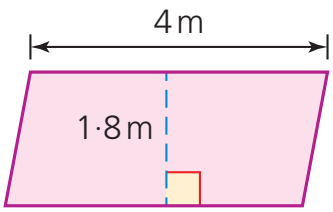

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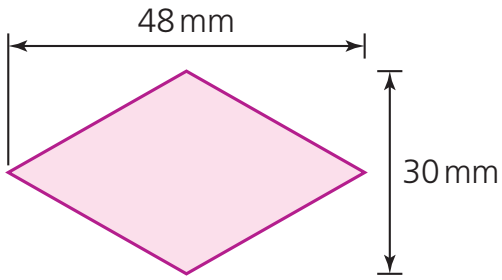

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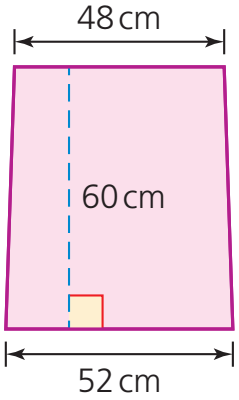
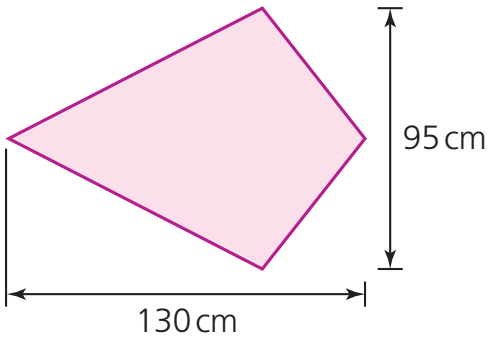
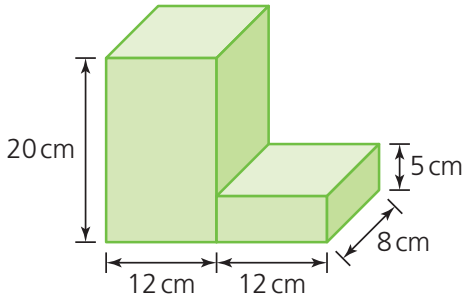


(f)



3. Calculate the volume of each shape.

(a)



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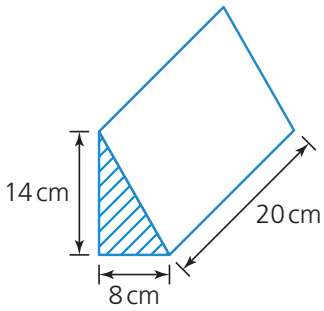
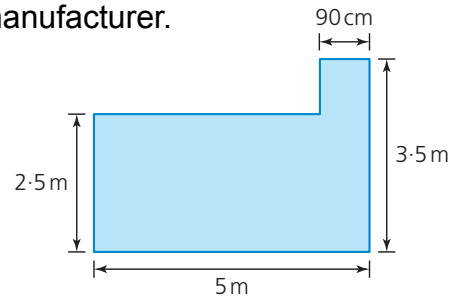


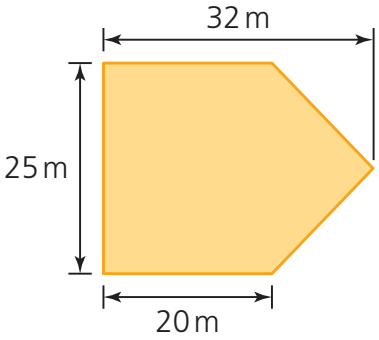
4. The diagram shows a worktop for a small food manufacturer.



(a) Calculate the total area of the worktop.
Give your answer in square metres.

(b) The worktop will have edging all the way around. Calculate the total length of the perimeter edging.

5. The diagram shows the dimensions of a playpark.



(a) Calculate the total area of the playpark.

(b) The council plans to resurface the playpark with one of these:

- rubber, costing £40 per square metre
- bark, costing £13 per square metre.

The total budget for the project is £20 000.

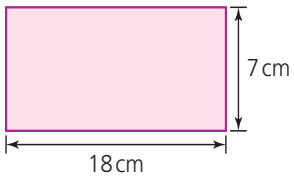
Which option would you recommend?

Show working to clearly explain your answer.

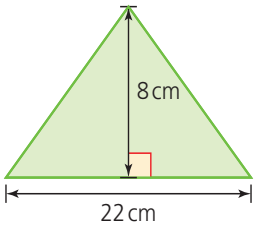
6 Measurement Assessment

1. Calculate the area of each shape:

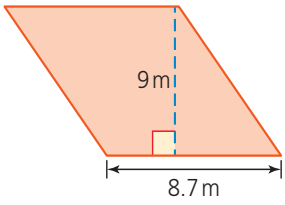
(a)



(b)



(c)

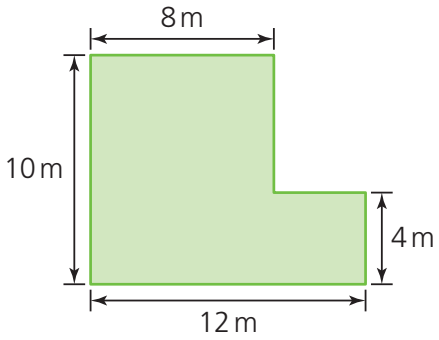


2. A gymnastics club buys new mats and sets them out to form the shape with dimensions shown.

(a) Calculate the total area of the mats.

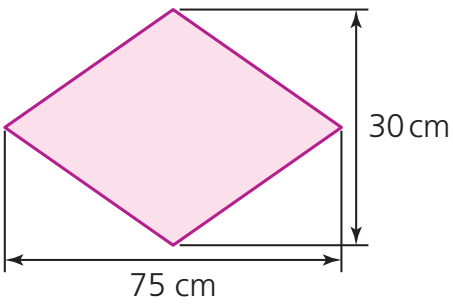
The mats cost £9 per square metre.

(b) Calculate the total cost of the new mats.



3. Calculate the area of each shape. Give your answer in square centimetres.

(a)



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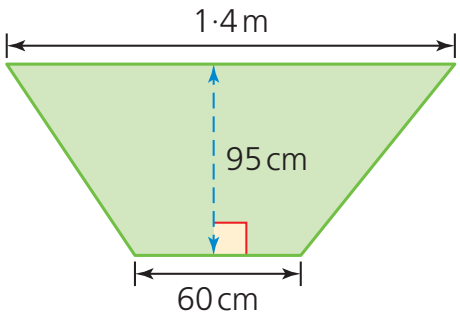
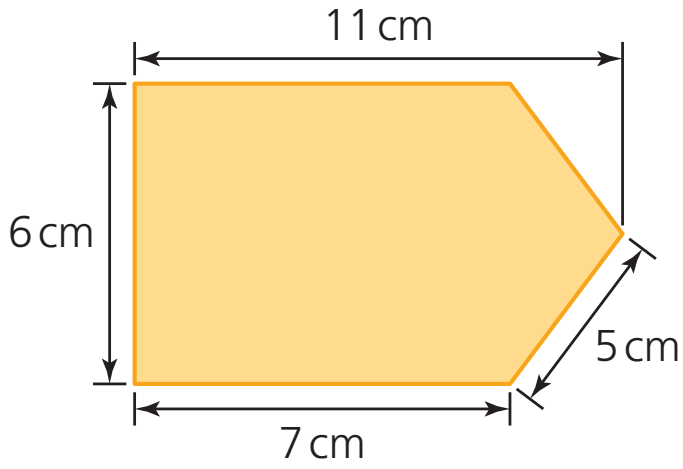


4. The diagram shows the dimensions of a sticky note.

(a) Calculate the perimeter of the sticky note.

(b) Calculate the area of the sticky note.



5. A community garden has the water feature shown. The outside of the water feature is a cube.

It has a square hole that runs all the way through the shape.

The dimensions are shown.

(a) Calculate the volume of the water feature.

(b) Find the capacity of the water feature in litres.