

PlusOne

Mathematics



$$7 \times 2 = 14$$



Grade
4

PlusOne

Mathematics

Teacher's Guide



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Introduction

The **PlusOne Mathematics Grade 4 Teacher's Guide** is a detailed book that complements the teaching of Mathematics in Zimbabwean primary schools. This book offers valuable guidelines on how to deliver effective lessons using the HBC PlusOne Mathematics Grade 4 Learner's Book.

The subject, Mathematics, aims at producing a morally upright Zimbabwean, who is responsible and capable of maintaining a socially sound lifestyle. It seeks to explore social, cultural, geographical and technological space to develop the cognitive, affective and psychomotor domains of the learner. As a foundational tool for logic and arrangement, Mathematics assists in the teaching and learning of other learning areas across the curriculum. Broadly, the syllabus aims to produce learners who can:

- apply Mathematical concepts and skills in relevant life situations.
- solve problems using a variety of Mathematical strategies.
- communicate Mathematical ideas clearly and confidently.
- utilise ICT tools in Mathematical investigations and operations.
- demonstrate an understanding of Zimbabwean heritage through ethno-Mathematics.
- develop mental agility and logical reasoning skills.
- apply measurement, estimation, and data handling skills in daily activities.
- demonstrate accuracy and efficiency in number operations.
- appreciate the beauty and utility of Mathematics in the environment.
- comment meaningfully on data to develop skills such as critical thinking, problem solving, team building and tolerance.
- use appropriate Mathematical language in line with our cultural values.

Topics/Skills

The learning and teaching of Mathematics will focus on the following skills:

- 1 Number
- 2 Operations
- 3 Measures
- 4 Relationships

The objective of this Grade 4 Teacher's Guide is to make teaching and learning more interactive, practical and useful, and to bring out the ingenuity of teacher professionalism in the teacher to produce well-equipped learners for national development.

Philosophy of teaching Mathematics

Mathematics provides opportunity for teachers to adopt cross-cutting and creative pedagogic approaches such as talk for learning, project-based learning, games, modelling, questioning, songs, storytelling and role-play necessary for achieving a conducive learning environment and developing learners into creative, honest and responsible citizens. The Mathematics classrooms should be learning-centred where the teacher, acting as a facilitator, introduces the topics for the day and assists learners to describe and analyse issues raised.

In addition, the teacher helps learners to interact and share ideas among themselves based on their knowledge of Zimbabwe and the world. The class will be encouraged to explore topics through enquiry-based questions. The teacher should emphasise these important areas in day-to-day learning as they are aimed at promoting higher order thinking among learners.

Philosophy of learning Mathematics

Through the learning of Mathematics, learners will specifically acquire:

- critical thinking and problem-solving skills to be able to compare, analyse, evaluate and apply Mathematical knowledge with little or no supervision.
- creative thinking skills to be able to reconstruct important information confidently.
- digital literacy skills to be able to use IT tools and resources (such as calculators and software) efficiently for investigations and project works.
- effective communication skills to be able to share Mathematical information at various levels of interaction.
- values to live as global citizens capable of learning about other peoples and cultures of the world.
- leadership skills to be able to effectively build a team and influence others to accomplish a common task.

Subject specific aims

The syllabus should enable learners to:

- develop a positive attitude towards Mathematics.
- foster problem-solving skills into learners.
- communicate Mathematical information to develop critical thinking and logical reasoning.
- develop Mathematical concepts and skills for use in entrepreneurship and other facets of life.
- develop psycho-social skills such as self-control and free expression of emotions which contribute to the development of the learner.
- develop an awareness of national heritage in the learning of Mathematics.
- promote an awareness of IKS in the teaching and learning of Mathematics.

Instructional expectations

Mathematics provides opportunity for teachers to:

- adopt thematic and creative pedagogic approaches such as the concrete-pictorial-abstract approach, project-based learning, games and modelling.
- nurture and develop learners into creative, honest and responsible citizens.
- adopt collaborative approaches to lesson preparation within and across disciplines and grade levels to develop communities of Mathematics learners.

- use multiple methods to systematically gather data about learners’ understanding and ability to guide the teaching and learning of Mathematics.
- put necessary arrangements in place to provide feedback to both learners and parents.

Interpretation of key words in the syllabus

Topics are the broad areas of the Mathematics curriculum. Units are larger groups of related objectives. Content objectives indicate what all learners should know, understand and be able to do. Objectives are clear statements of specific things learners should know and be able to do within each unit.

Class management

Most teachers in Zimbabwe teach large classes. The teachers, based on their professional experience over the years, have developed skills in classroom methodology. Here are a few reminders about the whole class, group, pair and individual work that could be helpful with large classes.

Whole class teaching

Much of your teaching, especially when your class is large, will involve you standing at the front of the class explaining and listening to your learners. You can set out facts and concepts which everyone can understand. However, your class will vary in ability. More able learners should be given additional tasks to stretch their capabilities while those who find understanding more difficult should be given the time and attention they need.

When you introduce a topic make sure you use learners’ existing knowledge and build upon it. The basic information for your lesson is in the text. Work out during your lesson planning which concepts will be difficult for them to understand and explain these first. Make sure that all your learners have understood your explanation and give time to those having difficulty.

1 Group work

Class teaching is large group work but sometimes there are advantages in working in pairs or groups of four to six learners. Some children make more progress when working in a group of the same ability. On other occasions, more able learners can help those who are not quite so quick at understanding.

There are many advantages in allowing several children to consider a Mathematical problem, work jointly and bring their findings back to the whole class: each group will think in a slightly different way and have different experiences to share. Individual groups can study a diagram together, solve a complex operation, or discuss a topic like budgeting in their community.

2 Pair work

Learners are often instructed to work in pairs – either with their desk mate or with a partner. This is an ideal opportunity for learners to assist each other, and for them to assess each other. Working with a deskmate offers the least classroom disturbance. They ask and answer questions during “shape talk” and they discuss the steps of a calculation before they solve individual exercises.

3 Learner self-study

There will be times when you want the class to work as individuals to allow them to become familiar with material you have given them and to allow you to work with learners of different abilities. It is essential that the material they use is understandable to them. Use additional material at different levels to ensure that some learners do not finish more quickly than others.

Teaching tip

One of the most important skills in classroom management is the ability to ensure your learners are occupied for the whole lesson. If a group has finished its task and has nothing else to do it is likely to become disruptive. Break up your lesson and make sure it has several different parts:

- full class work,
- individual work,
- practical activities (measuring, drawing, weighing).

The syllabus emphasises the:

- creation of learning-centred classrooms using creative approaches to ensure learner empowerment.
- positioning of inclusion and equity at the centre of quality teaching.
- use of Information and Communications Technology (ICT) as a pedagogical tool.
- integration of assessment as learning, for learning and of learning.

Learning-centred pedagogy

The learner is at the centre of learning. At the heart of the national curriculum for change and sustainable development is the learning progression and improvement of learning outcomes for

Zimbabwe's young people. It is expected that at each curriculum phase, learners would be offered the essential learning experiences to progress seamlessly to the next phase. Where there are indications that a learner is not sufficiently ready for the next phase, a compensatory provision through differentiation should be provided to ensure that such a learner is ready to progress with his/her cohort.

The syllabus encourages the creation of a learning centred classroom with the opportunity for learners to engage in meaningful “hands-on” activities that bring home to the learner what they are learning in school and what they know from outside of school. The learning centred classroom is a place for the learners to discuss ideas through the inspiration of the teacher.

The learners then become actively engaged in looking for answers, working in groups to solve problems. They also research information, analyse and evaluate information. The aim of the learning-centred classroom is to enable learners to take ownership of their learning. It provides the opportunity for deep and profound learning to take place.

The teacher as a facilitator needs to create a learning environment that:

- makes learners feel safe and accepted.
- helps learners to interact with varied sources of information in a variety of ways.
- helps learners to identify a problem suitable for investigation through project work.
- connects the problem with the context of the learners' world so that it presents realistic opportunities for learning.
- organises the subject matter around the problem, not the subject.
- gives learners responsibility for defining their learning experience and planning to solve the problem.
- encourages learners to collaborate in learning.
- expects all learners to demonstrate the results of their learning through a product or performance.

It is more productive for learners to find answers to their own questions rather than teachers providing the answers and their opinions in a learning-centred classroom. The content with reference to learner's activities in class and outside classroom focusses on learner-centred pedagogy, which emphasises active participation in class activities, making teaching and learning more practical and toward achieving positive learning outcomes that largely benefit the learner.

Pedagogical approaches

Effective teaching and learning in Mathematics depend upon the use of actively participatory methods including the following:

- Demonstration
- Mathematical Games
- Individual and group presentations
- Modelling (making 3D shapes)
- Educational tours/Excursions (visiting a bank or market)
- E-Learning
- Case studies (financial literacy)
- Problem-based learning
- Scenes/Models/Resource persons (for example, inviting an engineer or accountant)

Inclusion

Inclusion is ensuring access and learning for all learners especially those disadvantaged. Planning, delivery and reflection on daily learning experiences should take these differences into consideration, ensuring learners with visual or learning impairments are supported with appropriate media (for example, Braille or tactile models).

Differentiation and scaffolding

Differentiation is a process by which differences (learning styles, interest and readiness to learn) between learners are accommodated so that all learners in a group have the best possible chance of learning. Differentiation could be by task, support and outcome. Differentiation as a way of ensuring each learner benefits adequately from the delivery of the curriculum can be achieved in the classroom through:

- a** task,
- b** one-on-one support,
- c** learning outcomes.

Differentiation by task: Setting different Mathematical problems for learners of different abilities.

Differentiation by support: Giving one-on-one help to learners struggling with specific operations.

Differentiation by outcome: Allowing learners to respond at different levels of complexity.

Scaffolding in education refers to the use of variety of instructional techniques aimed at moving learners progressively towards stronger understanding and ultimately greater independence in the learning process. It involves breaking up a complex Mathematical task (like long division) into smaller steps. Common strategies include:

- giving learners a simplified version of a problem.
- illustrating a concept (like fractions) in multiple ways (diagrams, physical objects).
- giving learners a model of an assignment they will be asked to complete.

Learner activities

The types of activities used to ensure multi-ability learning include:

- practical measuring and weighing,
- geometric drawing,
- role-play (buying and selling),
- Mathematical songs and games,
- crosswords and number puzzles,
- matching activities (shapes to names),
- case studies and interviews.

Core competencies

Activities in the text serve to:

- break up the lesson to aid concentration.
- extend the knowledge gained from the text.
- develop academic skills such as calculation, data interpretation, and spatial awareness.
- develop communication skills: discussing strategies and reporting findings.

In later primary years the activities should also help learners to look beyond the material easily available to them by encouraging them to ask other adults, visit libraries (if there are any) and use the internet if it is available.

The Learner's Book aims to use a variety of approaches to offer as many ways of learning as possible. No one way suits every learner. As an example, there are many ways to teach reading. The best teachers use every method they know to suit everyone in their class.

Some people learn quickly by reading with understanding. Others need to learn through practical experience. You will have all types of learners in your class. You will need additional activities to broaden the learning experience, some tailored to the needs of able learners and others to add variety and depth to various topics.

Practical activities

In Mathematics, these cover all activities which include a practical skill. The obvious ones are drawing and measuring, but equally valuable is making a model of a house or using local market scenarios to understand profit and loss. Learning needs to be made enjoyable to encourage lifelong interest.

Practising skills

Acquisition of study skills and knowledge has, by and large, been through practical lessons. Oral lessons cannot necessarily and abundantly give the learner the required skills and knowledge.

Learners need to practise:

- **Calculation:** Developing speed and accuracy in operations.
- **Measurement:** Using SI units correctly in real-world contexts.
- **Logical reasoning:** Practising concentration and step-by-step thinking.
- **Research skills:** Looking for Mathematical patterns in the environment. Research skills are important too. You can encourage learners to go beyond the Learner's Book in these later years of their primary schooling to look for additional materials and to store only those facts which will be of long-term use and lifelong learning.

Use of ICT

Some schools in urban areas have access to computers in school or in libraries. Rural areas will become linked in the future. You should learn how to use a computer as soon as you are able. They open the world as your resource. The internet can provide as much additional material as you will ever need.

Once your learners have the chance to use a computer, they too will have access to a world of information. Effective use of ICT in Mathematics includes:

- Calculators
- Laptops/Tablets for graphing or coding (Scratch Jr).

- Projectors for visualising geometric transformations.
- Spreadsheets (Microsoft Excel) for data handling.

The teacher should try as much as possible use whatever technological resources available such as any of those stated above to assist in teaching and learning. The use of ICTs in teaching and learning activities promotes a paradigm shift to learner-centred environment.

Here are some useful ideas on how to go about this:

- Integrate ICT's in the learning process, as a key competence and contributing to the acquisition of skills and knowledge;
- Use ICT's in the classroom to work on information processing, authentic communication, and on the learner autonomy, as the builder of his or her own learning process;
- Give ICT's a role to help young people be able to arrange, evaluate, synthesise, analyse and decide on the information that comes to them;
- Learners with different types of supports and formats and, therefore, a great variety of activities in which they pass from receivers to makers;
- Attend to the diversity or learning needs of learners, using the copious offer of interactive exercises available on the web.

Making sure that learners have absorbed the lessons taught and not just had fun through the entire lesson is equally important. There are assessments at the end of each lesson in the Learner's Book that are useful tools for reinforcement of lessons taught.

You can also adopt other forms of assessment during the lessons to ensure learners are on the same level of understanding. Some of these assessments include the following:

Diagnostic assessment

Examining prior knowledge to establish links to new lessons. This examines learners' prior knowledge and is used to establish links to the new lesson. Test learners' prior knowledge by asking them to respond to key words, names and dates related to the next topic. Ask learners to define key words and terms.

Formative assessment

Formative assessment is the methods that teachers use to evaluate and assess a learner's ability to understand and apply what they have learnt during a lesson.

Topic 1

Number

Unit 1: Whole numbers

Unit objectives

By the end of this unit, learners should be able to:

- a read numbers in words and Arabic numerals.
- b write numbers in words and Arabic numerals.
- c tell the positions of objects in a row.
- d draw abacuses to show numbers
- e write whole numbers in expanded notation.
- f compare any two numbers using the comparison signs ($<$, $>$ and $=$).
- g arrange numbers in order of size.
- h round off numbers to the nearest ten, hundred and thousand.
- i estimate quantities of objects.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 1–25.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 1.1

- a 1 001 to 1 020 1 001, 1 002, 1 003, 1 004, 1 005, 1 006, 1 007, 1 008, 1 009, 1 010, 1 011, 1 012, 1 013, 1 014, 1 015, 1 016, 1 017, 1 018, 1 019, 1 020
- b 1 200 to 1 226 1 200, 1 201, 1 202, 1 203, 1 204, 1 205, 1 206, 1 207, 1 208, 1 209, 1 210, 1 211, 1 212, 1 213, 1 214, 1 215, 1 216, 1 217, 1 218, 1 219, 1 220, 1 221, 1 222, 1 223, 1 224, 1 225, 1 226
- c 1 658 to 1 672 1 658, 1 659, 1 660, 1 661, 1 662, 1 663, 1 664, 1 665, 1 666, 1 667, 1 668, 1 669, 1 670, 1 671, 1 672
- d 1 985 to 1 999 1 985, 1 986, 1 987, 1 988, 1 989, 1 990, 1 991, 1 992, 1 993, 1 994, 1 995, 1 996, 1 997, 1 998, 1 999

- e** 2 000 to 2 031 2 000, 2 001, 2 002, 2 003, 2 004, 2 005, 2 006, 2 007, 2 008, 2 009, 2 010, 2 011, 2 012, 2 013, 2 014, 2 015, 2 016, 2 017, 2 018, 2 019, 2 020, 2 021, 2 022, 2 023, 2 024, 2 025, 2 026, 2 027, 2 028, 2 029, 2 030, 2 031
- f** 3 461 to 3 480 3 461, 3 462, 3 463, 3 464, 3 465, 3 466, 3 467, 3 468, 3 469, 3 470, 3 471, 3 472, 3 473, 3 474, 3 475, 3 476, 3 477, 3 478, 3 479, 3 480
- g** 4 991 to 5 000 4 991, 4 992, 4 993, 4 994, 4 995, 4 996, 4 997, 4 998, 4 999, 5 000

Activity 1.2

- 1** Learners take turns to pick cards and read to each other.
- 2**
 - a** 2 543 – Two thousand five hundred and forty-three
 - b** 3 832 – Three thousand eight hundred and thirty-two
 - c** 1 056 – One thousand and fifty-six
 - d** 3 648 – Three thousand six hundred and forty-eight
 - e** 4 321 – Four thousand three hundred and twenty-one
 - f** 5 000 – Five thousand
 - g** 2 335 – Two thousand three hundred and thirty-five

Exercise 1.1

- 1**
 - a** Teacher assesses orally.
 - b** Teacher assesses orally.
- 2**
 - a** 3 215, 3 216, 3 217, 3 218, 3 219, 3 220, 3 221
 - b** 4 080, 4 082, 4 084, 4 086, 4 088, 4 090, 4 092
 - c** 1 500, 1 600, 1 700, 1 800, 1 900, 2 000, 2 100, 2 200
 - d** 2 898, 2 900, 2 902, 2 904, 2 906, 2 908, 2 910, 2 912

Activity 1.3

- 1** Learners read aloud row by row. The teacher checks the correct reading.
Examples of correct readings:
 - 5 000 – Five thousand
 - 5 100 – Five thousand one hundred
 - 5 900 – Five thousand nine hundred
 - 6 000 – Six thousand
 - 7 500 – Seven thousand five hundred
 - 9 900 – Nine thousand nine hundred
- 2**
 - a** 5 500 to 7 500 counting backwards in hundreds
7 500, 7 400, 7 300, 7 200, 7 100, 7 000, 6 900, 6 800, 6 700, 6 600, 6 500, 6 400, 6 300, 6 200, 6 100, 6 000, 5 900, 5 800, 5 700, 5 600, 5 500

- b** 6 005 to 6 015 counting backwards in fives: 6 015, 6 010, 6 005
- c** 9 910 to 10 000 counting forward in tens: 9 910, 9 920, 9 930, 9 940, 9 950, 9 960, 9 970, 9 980, 9 990, 10 000
- d** 10 000 to 4 500 counting backwards in thousands: 10 000, 9 000, 8 000, 7 000, 6 000, 5 000

Exercise 1.2

- 1**
 - a** Learners read orally. Teacher assesses pronunciation.
 - b** Learners read orally. Teacher assesses pronunciation.
- 2**
 - a** 6 745, 6 746, 6 747, 6 748, 6 749, 6 750, 6 751
 - b** 9 520, 9 522, 9 524, 9 526, 9 528, 9 530, 9 532
 - c** 7 000, 7 100, 7 200, 7 300, 7 400, 7 500, 7 600, 7 700
 - d** 8 448, 8 450, 8 452, 8 454, 8 456, 8 458, 8 460, 8 462

Activity 1.4

1

Symbols	Words
1 001	One thousand and one
2 400	Two thousand four hundred
3 789	Three thousand seven hundred and eighty-nine
500	Five hundred
600	Six hundred
700	Seven hundred
800	Eight hundred
400	Four hundred
9 900	Nine thousand nine hundred
10 000	Ten thousand

- a** 125 – One hundred and twenty-five
 - b** 648 – Six hundred and forty-eight
- 2**
 - a** Four hundred and five → 405
 - b** Seven hundred and seventy → 770

Exercise 1.3

- 1**
 - a** 256 – Two hundred and fifty-six
 - b** 238 – Two hundred and thirty-eight
 - c** 920 – Nine hundred and twenty
 - d** 909 – Nine hundred and nine
 - e** 805 – Eight hundred and five
 - f** 452 – Four hundred and fifty-two

g 789 – Seven hundred and eighty-nine

h 808 – Eight hundred and eight

2 972 – Nine hundred and seventy-two

3 345 – Three hundred and forty-five

4 821 – Eight hundred and twenty-one

5 507 – Five hundred and seven

6 294 – Two hundred and ninety-four

Activity 1.5

1 Tenth

2 Twelfth

3 Thirteenth

4 Fourteenth

5 Sixteenth

6 Twenty-fourth

7 Twenty-sixth

8 Thirty-third

9 Fiftieth

10 Fifty-eighth

11 Sixty-second

12 Sixty-fifth

13 Sixty-eighth

14 Seventieth

15 Eightieth

Exercise 1.5

1 Second

2 Fourth

3 Sixth

4 Eighth

5 Tenth

6 Twelfth

7 Fifteenth

8 Twentieth

9 Twenty-third

10 Twenty-fifth

11 Twenty-eighth

12 Thirtieth

13 Thirty-fifth

14 Fortieth

15 Fiftieth

Activity 1.6

- 1**
- a** The cup is in the third position.
 - b** The puppy is in the fourth position.
 - c** The chair is in the first position.
 - d** The apple is in the second position.
 - e** The plate is in the fifth position.

2

Number	Position	Position name
a. 22	22 nd	Twenty-second
b. 34	34 th	Thirty-fourth
c. 47	47 th	Forty-seventh
d. 58	58 th	Fifty-eighth
e. 61	61 st	Sixty-first
f. 72	72 nd	Seventy-second
g. 85	85 th	Eighty-fifth
h. 95	95 th	Ninety-fifth

3 Beads: Learners circle the beads in the 12th and 16th positions.

4 Learners write the alphabet positions from (A–Z) in their exercise books.

a 15th position → O

b 25th position → Y

c 20th position → T

Activity 1.7

1

Number	Thousands	Hundreds	Tens	Units
a. 7 524	7	5	2	4
b. 3 128	3	1	2	8
c. 6 197	6	1	9	7
d. 8 048	8	0	4	8
e. 8 432	8	4	3	2

2 a 90 000

b 90 000

c 9 000

d 900

Exercise 1.6

1 a Units

b Tens

c Hundreds

d Thousands

e Thousands

2 a 5

b 3

c 4

d 1

e 1

3 Thousands

4 Hundreds

5 Thousands

6 Hundreds

7 Thousands

Activity 1.8

Learners draw abacuses to show:

- 1 456: 4 beads on H, 5 on T, 6 on U.
- 2 325: 3 beads on H, 2 on T, 5 on U.
- 3 254: 2 beads on H, 5 on T, 4 on U.
- 4 326: 3 beads on H, 2 on T, 6 on U.
- 5 423: 4 beads on H, 2 on T, 3 on U.
- 6 6 452: 6 beads on Th, 4 on H, 5 on T, 2 on U.
- 7 5 423: 5 beads on Th, 4 on H, 2 on T, 3 on U.
- 8 8 541: 8 beads on Th, 5 on H, 4 on T, 1 on U.
- 9 7 542: 7 beads on Th, 5 on H, 4 on T, 2 on U.
- 10 8 240: 8 beads on Th, 2 on H, 4 on T, 0 on U.

Exercise 1.7

- | | |
|---------|---------|
| 1 121 | 4 3 211 |
| 2 112 | 5 4 212 |
| 3 5 222 | 6 312 |

Activity 1.9

- | | |
|---|--|
| 1  | 6  |
| 2  | 7  |
| 3  | 8  |
| 4  | 9  |
| 5  | 10  |

Exercise 1.8

- | | |
|------|------|
| 1 4 | 4 12 |
| 2 6 | 5 13 |
| 3 10 | |

Activity 1.10

- | | | | |
|---|----------------|----|----------------|
| 1 | $100 + 10 + 2$ | 6 | $400 + 20 + 1$ |
| 2 | $100 + 20 + 3$ | 7 | $400 + 60 + 2$ |
| 3 | $200 + 10 + 4$ | 8 | $500 + 40 + 2$ |
| 4 | $200 + 80 + 5$ | 9 | $800 + 40 + 5$ |
| 5 | $300 + 20 + 5$ | 10 | $900 + 60 + 3$ |

Exercise 1.9

- 1
- a 2 hundreds, 1 ten, 4 units
 - b 2 hundreds, 3 tens, 6 units
 - c 3 hundreds, 2 tens, 2 units
 - d 3 hundreds, 2 tens, 6 units
 - e 3 thousands, 4 hundreds, 2 tens, 5 units
- 2
- a 741
 - b 804
 - c 523
 - d 6 305
 - e 5 036
 - f 9 578

Activity 1.11

- | | | | |
|---|-------------------|----|-------------------|
| 1 | $200 > 150$ | 6 | $5\,405 < 5\,600$ |
| 2 | $2\,008 > 1\,550$ | 7 | $8\,119 < 8\,325$ |
| 3 | $3\,215 > 1\,315$ | 8 | $9\,800 < 9\,980$ |
| 4 | $5\,888 = 5\,888$ | 9 | $7\,532 < 7\,935$ |
| 5 | $2\,511 > 2\,350$ | 10 | $8\,700 < 8\,900$ |

Exercise 1.10

- 1 John has more sweets.
- 2 Sipho is younger.
- 3 Thabo ran further.
- 4 Edson has fewer books.
- 5 Mr Mavhu has more cattle.
- 6 Class A has fewer learners.
- 7 Mr Gudo bought fewer chickens.
- 8 Timothy has more sweets.
- 9 December has more days.
- 10 The tomato crop has more plants.

Exercise 1.11

- 1 1 255, 1 500, 2 132, 2 654, 3 169, 3 598, 4 387, 5 421
- 2 1 012, 1 212, 2 163, 2 811, 3 123, 3 253, 4 256, 4 588
- 3 1 235, 1 809, 1 900, 2 387, 2 700, 3 133, 3 243, 4 488
- 4 1 672, 2 138, 2 999, 3 191, 3 936, 4 542, 5 654, 6 666
- 5 2 104, 2 633, 2 735, 3 307, 4 700, 5 087, 5 412, 6 678
- 6 2 354, 2 368, 2 599, 3 732, 4 511, 4 721, 5 655, 8 511
- 7 3 320, 4 545, 5 201, 5 472, 6 351, 6 392, 7 482, 8 472
- 8 2 710, 3 335, 3 686, 4 500, 4 700, 5 400, 6 500, 7 554

Exercise 1.12

- 1 2 221, 2 003, 1 773, 1 552, 1 515, 1 203, 1 009, 1 000
- 2 8 601, 7 035, 6 909, 5 774, 5 651, 4 225, 3 334, 2 401
- 3 8 779, 7 334, 6 678, 4 429, 4 315, 3 893, 3 780, 2 612
- 4 9 890, 9 319, 8 767, 8 048, 7 434, 6 812, 5 600, 4 548
- 5 8 556, 7 690, 6 681, 5 655, 4 516, 3 236, 2 226, 1 716
- 6 8 235, 7 415, 6 573, 5 525, 4 544, 3 105, 2 665, 1 615
- 7 9 007, 8 347, 7 117, 6 287, 5 217, 4 047, 3 722, 2 735
- 8 8 003, 7 903, 6 503, 5 103, 4 223, 3 333, 2 317, 1 390

Activity 1.12

- | | |
|-------|--------|
| 1 10 | 6 240 |
| 2 20 | 7 560 |
| 3 30 | 8 750 |
| 4 130 | 9 850 |
| 5 210 | 10 330 |

Exercise 1.13

Learners round off any realistic numbers they can work with, for example:

- 1
 - a 10 books
 - b 15 chalks
 - c 40 learners
 - d 30 teachers
- 2
 - a 10 crayons
 - b 20 desks
 - c 30 teachers
 - d 10 children
 - e 30 days

Activity 1.13

- | | |
|-------|--------|
| 1 300 | 6 300 |
| 2 500 | 7 500 |
| 3 600 | 8 500 |
| 4 800 | 9 800 |
| 5 700 | 10 900 |

Exercise 1.14

- 1 Learners round off any realistic numbers, for example:
- a 1000 learners
 - b 10 000 books
 - c 50 trees
 - d 500 desks
- 2
- a 200 cents
 - b 200 cents
 - c 900 cattle
 - d 800 books
 - e 700 plants

Activity 1.14

Facilitator to read out the instructions on [page 21](#).

Activity 1.15

- | | | | |
|---------|---------|----------|----------|
| 1 3 000 | 4 6 000 | 7 9 000 | 10 9 000 |
| 2 3 000 | 5 6 000 | 8 9 000 | |
| 3 5 000 | 6 7 000 | 9 10 000 | |

Exercise 1.15

- | | |
|---------|---------|
| 1 2 000 | 4 3 000 |
| 2 1 000 | 5 4 000 |
| 3 2 000 | 6 5 000 |

Unit revision exercises

Multiple choice answers

- | | | | |
|-----|-----|-----|-----|
| 1 B | 3 C | 5 C | 7 A |
| 2 A | 4 D | 6 B | 8 A |

- 9 B
10 A
11 C

- 12 A
13 D
14 C

- 15 D
16 D
17 C

- 18 B
19 B
20 C

Structured questions answers

- 21 Two hundred and thirty-one
22 462
23 322
24 31st
25 $200 + 50 + 3$
26 Tens
27 600
28 a 7 hundreds 5 tens 1 unit
b 6 thousands 7 hundreds 8 tens 3 units
29 655, 660, 665
30 996, 995, 994
31 Mr Kuda
32 60
33 260
34 6000
35 300

Unit 2: Arabic and Roman numerals

Unit objectives

By the end of this unit, learners should be able to:

- a write numbers in Arabic and Roman numerals.
b convert numbers from Arabic to Roman numerals and vice versa.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 26–31.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 2.1

Make and read two-digit numbers using the digits 2 and 3. For example:

- a 23
- b 32

Activity 2.2

Make and read three-digit numbers using the digits 2, 4, and 3. For example:

- | | |
|-------|-------|
| a 243 | d 423 |
| b 234 | e 342 |
| c 432 | f 324 |

Activity 2.3

- | | |
|------|-------|
| 1 6 | 9 12 |
| 2 11 | 10 8 |
| 3 51 | 11 12 |
| 4 55 | 12 13 |
| 5 60 | 13 52 |
| 6 15 | 14 52 |
| 7 7 | 15 53 |
| 8 8 | |

Exercise 2.1

- | | |
|------|------|
| 1 4 | 6 10 |
| 2 9 | 7 11 |
| 3 49 | 8 50 |
| 4 45 | 9 12 |
| 5 49 | |

Exercise 2.2

- | | | |
|----------|----------|----------|
| 1 XIX | 7 LII | 13 LII |
| 2 XV | 8 LX | 14 LXXI |
| 3 XVIII | 9 LXXII | 15 XXXVI |
| 4 XXX | 10 LXXXV | |
| 5 XL | 11 XC | |
| 6 XLVIII | 12 LXXXI | |

Unit revision exercises

Multiple choice answers

- | | | | |
|-----|------|-----|-----|
| 1 C | 3 B | 5 B | 7 C |
| 2 D | 4 54 | 6 B | 8 C |

Structured questions answers

- 9
- a X
 - b XX
 - c XXXV
 - d LV
 - e LX
 - f C
- 10
- a 14
 - b 20
 - c 60
 - d 59
 - e 24
 - f IX: 9
 - g 26
 - h 70
- 11 9 minutes past 10
- 12 No, she is incorrect. XXXIV is 34; 24 is XXIV.
- 13 59 cattle.

Unit 3: Proper fractions

Unit objectives

By the end of this unit, learners should be able to:

- a read and write fractions in numerals.
- b interpret diagrams representing fractions.
- c draw, name and shade fractions on diagrams.
- d reduce fractions to lowest terms.
- e use fractions and number strips to find equivalent fractions.
- f compare fractions.
- g arrange fractions in ascending and descending order.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 32–48.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 3.1

- Total learners: 25
- Girls: 17
- Boys: $25 - 17 = 8$
 - a** Fraction of boys: $\frac{8}{25}$
 - b** Numerator: 8 (the top number), Denominator: 25 (the bottom number).

Exercise 3.1

Fraction	Numerator	Denominator
1. $\frac{2}{5}$	2	5
2. $\frac{5}{8}$	5	8
3. $\frac{8}{9}$	8	9
4. $\frac{4}{12}$	4	12
5. $\frac{8}{11}$	8	11

Activity 3.2

- a** One-half
- b** Two-fifths
- c** Three quarters
- d** Seven tenths
- e** Fifteen over twenty

Exercise 3.2

- 1
 - a** One quarter
 - b** Two tenths
 - c** Nine tenths
 - d** Five twentieths
 - e** Three-fifths
 - f** Four twentieths
- 2
 - a** $\frac{4}{5}$
 - b** $\frac{3}{10}$
 - c** $\frac{2}{4}$
 - d** $\frac{5}{5}$

- e $\frac{9}{10}$
- f $\frac{1}{5}$

Exercise 3.3

- 1
 - a $\frac{1}{2}$
 - b $\frac{2}{3}$
 - c $\frac{2}{5}$
 - d $\frac{3}{6}$
 - e $\frac{6}{10}$
 - f $\frac{2}{3}$
- 2
 - a Learners shade one square.
 - b Learners shade one half of the circle.
 - c Learners shade 4 triangles.

Exercise 3.4

- | | |
|-----------------|-------------------|
| 1 $\frac{1}{2}$ | 9 $\frac{7}{8}$ |
| 2 $\frac{1}{2}$ | 10 $\frac{4}{5}$ |
| 3 $\frac{1}{2}$ | 11 $\frac{8}{9}$ |
| 4 $\frac{1}{2}$ | 12 $\frac{5}{6}$ |
| 5 $\frac{3}{4}$ | 13 $\frac{3}{4}$ |
| 6 $\frac{2}{3}$ | 14 $\frac{8}{9}$ |
| 7 $\frac{5}{6}$ | 15 $\frac{9}{10}$ |
| 8 $\frac{3}{4}$ | |

Exercise 3.5

- | | |
|-----------------|------------------|
| 1 $\frac{2}{3}$ | 6 $\frac{2}{3}$ |
| 2 $\frac{1}{2}$ | 7 $\frac{5}{6}$ |
| 3 $\frac{4}{5}$ | 8 $\frac{3}{5}$ |
| 4 $\frac{1}{2}$ | 9 $\frac{4}{5}$ |
| 5 $\frac{3}{4}$ | 10 $\frac{4}{5}$ |

Exercise 3.6

1 $\frac{4}{10}$

2 $\frac{6}{10}$

3 $\frac{4}{5}$

4 $\frac{12}{20}$

5 $\frac{8}{12}$

6 $\frac{8}{20}$

7 $\frac{4}{8}$

Exercise 3.7

1 $\frac{2}{7} > \frac{1}{7}$

2 $\frac{8}{10} > \frac{6}{10}$

3 $\frac{9}{15} < \frac{10}{15}$

4 $\frac{20}{30} > \frac{15}{30}$

5 $\frac{22}{25} < \frac{23}{25}$

6 $\frac{26}{30} > \frac{20}{30}$

7 $\frac{40}{50} < \frac{45}{50}$

8 $\frac{60}{70} > \frac{50}{70}$

9 $\frac{50}{80} < \frac{60}{80}$

10 $\frac{80}{100} > \frac{65}{100}$

Exercise 3.8

1 a $\frac{3}{5}$

b $\frac{5}{6}$

c $\frac{3}{4}$

d $\frac{2}{3}$

e $\frac{8}{10}$

f $\frac{5}{20}$

2 a $\frac{7}{12}$

b $\frac{9}{15}$

c $\frac{5}{10}$

d $\frac{10}{25}$

g $\frac{5}{27}$

h $\frac{10}{25}$

3 John ate a bigger cake.

4 Six-eighths is smaller.

Exercise 3.9

- 1 $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}$
- 2 $\frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{7}{10}$
- 3 $\frac{3}{12}, \frac{5}{12}, \frac{7}{12}, \frac{8}{12}$
- 4 $\frac{10}{20}, \frac{12}{20}, \frac{15}{20}, \frac{16}{20}$

Exercise 3.10

- 1 $\frac{2}{2}, \frac{3}{4}, \frac{3}{5}$
- 2 $\frac{2}{5}, \frac{4}{8}, \frac{1}{3}$
- 3 $\frac{5}{6}, \frac{3}{4}, \frac{5}{8}$

Exercise 3.11

- 1 $\frac{8}{10}, \frac{5}{10}, \frac{4}{10}, \frac{3}{10}$
- 2 $\frac{13}{15}, \frac{12}{15}, \frac{11}{15}, \frac{10}{15}$
- 3 $\frac{17}{18}, \frac{13}{18}, \frac{12}{18}, \frac{9}{18}$
- 4 $\frac{15}{20}, \frac{14}{20}, \frac{13}{20}, \frac{10}{20}$

Exercise 3.12

- 1 $\frac{2}{2}, \frac{3}{4}, \frac{3}{5}$
- 2 $\frac{4}{8}, \frac{2}{5}, \frac{1}{3}$
- 3 $\frac{5}{6}, \frac{3}{4}, \frac{5}{8}$

- 5 $\frac{18}{40}, \frac{20}{40}, \frac{30}{40}, \frac{35}{40}$
- 6 $\frac{25}{50}, \frac{35}{50}, \frac{38}{50}, \frac{40}{50}$
- 7 $\frac{40}{100}, \frac{60}{100}, \frac{70}{100}, \frac{80}{100}$
- 8 $\frac{92}{100}, \frac{94}{100}, \frac{96}{100}, \frac{98}{100}$

- 4 $\frac{5}{6}, \frac{3}{4}, \frac{2}{3}, \frac{4}{9}$
- 5 $\frac{6}{8}, \frac{5}{8}, \frac{3}{5}, \frac{1}{8}$
- 6 $\frac{7}{9}, \frac{5}{9}, \frac{4}{8}, \frac{4}{9}$

- 5 $\frac{24}{30}, \frac{22}{30}, \frac{18}{30}, \frac{16}{30}$
- 6 $\frac{36}{40}, \frac{28}{40}, \frac{20}{40}, \frac{18}{40}$
- 7 $\frac{48}{50}, \frac{45}{50}, \frac{40}{50}, \frac{38}{50}$
- 8 $\frac{90}{100}, \frac{80}{100}, \frac{70}{100}, \frac{40}{100}$

- 4 $\frac{5}{6}, \frac{3}{4}, \frac{2}{3}, \frac{4}{9}$
- 5 $\frac{6}{6}, \frac{5}{8}, \frac{3}{5}, \frac{1}{8}$
- 6 $\frac{7}{9}, \frac{5}{9}, \frac{4}{8}, \frac{4}{9}$

Unit revision exercises

Multiple choice answers

- | | | | |
|-----|------|------|------|
| 1 B | 6 B | 11 A | 16 B |
| 2 C | 7 C | 12 B | 17 D |
| 3 A | 8 A | 13 A | 18 D |
| 4 C | 9 A | 14 A | 19 A |
| 5 C | 10 A | 15 A | 20 C |

Structured questions answers

- 21 a $\frac{3}{4}$
b $\frac{5}{6}$

c $\frac{5}{6}$

d $\frac{2}{3}$

e $\frac{5}{6}$

22 a $\frac{5}{6}$ b $\frac{16}{25}$

23 a $\frac{2}{3}$ b $\frac{1}{3}$

24 Ascending: $\frac{3}{10}, \frac{2}{5}, \frac{1}{2}$

25 Descending: $\frac{3}{4}, \frac{3}{5}, \frac{1}{2}$

26



27 a $\frac{1}{3}$ b $\frac{1}{2}$ c $\frac{3}{4}$ d $\frac{4}{5}$

28 a $\frac{5}{6}$ b $\frac{11}{12}$ c $\frac{35}{60}$ d Both equal ($\frac{4}{5}$) e $\frac{35}{40}$ f $\frac{70}{80}$

29 Nomsa has more marks.

Unit 4: Mixed numbers

Unit objectives

By the end of this unit, learners should be able to:

- a identify parts of a mixed number.
- b write mixed numbers from diagrams.
- c compare mixed numbers.
- d arrange mixed numbers in ascending and descending order.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 49–59.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 4.1

- | | |
|--------------|--------------|
| 1 Mixed | 5 Mixed |
| 2 Not mixed. | 6 Not mixed. |
| 3 Not mixed. | 7 Not mixed. |
| 4 Not mixed. | 8 Mixed |

Exercise 4.1

- 1
 - a Proper fraction
 - b Mixed fraction
 - c Improper fraction
 - d Mixed fraction
 - e Proper fraction
 - f Mixed fraction
 - g Improper fraction
 - h Proper fraction
- 2
 - a Proper fractions: $\frac{1}{4}$, $\frac{2}{7}$ and $\frac{4}{9}$
 - b Improper fractions: $\frac{6}{5}$, $\frac{5}{4}$
 - c Mixed fractions: $3\frac{2}{5}$, $7\frac{1}{2}$ and $16\frac{7}{8}$

Exercise 4.2

- 1 $2\frac{1}{4}$
- 2 $3\frac{3}{4}$
- 3 $2\frac{1}{2}$
- 4 $2\frac{1}{3}$

Activity 4.2

- | | |
|-----|-----|
| 1 < | 3 > |
| 2 > | 4 > |

Exercise 4.3

- | | |
|-----|-----|
| 1 < | 4 > |
| 2 < | 5 < |
| 3 > | |

Activity 4.3

- 1 <
- 2 <
- 3 >

Exercise 4.4

- | | |
|-----|-----|
| 1 < | 4 < |
| 2 < | 5 > |
| 3 < | |

Exercise 4.5

- 1 >
- 2 >
- 3 >

- 4 >
- 5 <

Exercise 4.6

- 1 $2\frac{1}{5}, 2\frac{2}{5}, 2\frac{3}{5}, 2\frac{4}{5}$
- 2 $5\frac{2}{7}, 5\frac{3}{7}, 5\frac{4}{7}, 5\frac{5}{7}$

- 3 $8\frac{3}{10}, 8\frac{4}{10}, 8\frac{5}{10}, 8\frac{6}{10}$
- 4 $10\frac{1}{5}, 10\frac{2}{5}, 10\frac{3}{5}, 10\frac{4}{5}$

Exercise 4.7

- 1 $1\frac{1}{4}, 2\frac{1}{4}, 3\frac{1}{4}, 4\frac{1}{4}$
- 2 $3\frac{2}{5}, 4\frac{2}{5}, 5\frac{2}{5}, 6\frac{2}{5}$

- 3 $6\frac{1}{2}, 7\frac{1}{2}, 8\frac{1}{2}, 9\frac{1}{2}$
- 4 $9\frac{1}{5}, 10\frac{1}{5}, 11\frac{1}{5}, 12\frac{1}{5}$

Exercise 4.8

- 1 $3\frac{4}{5}, 3\frac{3}{5}, 3\frac{2}{5}, 3\frac{1}{5}$
- 2 $6\frac{4}{4}, 6\frac{3}{4}, 6\frac{2}{4}, 6\frac{1}{4}$

- 3 $8\frac{7}{10}, 8\frac{6}{10}, 8\frac{5}{10}, 8\frac{4}{10}$
- 4 $10\frac{4}{5}, 10\frac{3}{5}, 10\frac{2}{5}, 10\frac{1}{5}$

Exercise 4.9

- 1 $5\frac{1}{4}, 4\frac{1}{4}, 3\frac{1}{4}, 2\frac{1}{4}$
- 2 $1\frac{3}{5}, 8\frac{3}{5}, 7\frac{3}{5}, 3\frac{3}{5}$
- 3 $12\frac{1}{2}, 11\frac{1}{2}, 10\frac{1}{2}, 9\frac{1}{2}$
- 4 $15\frac{2}{10}, 14\frac{2}{10}, 13\frac{2}{10}, 12\frac{2}{10}$

Unit revision exercises

Multiple choice answers

- 1 A
- 2 C
- 3 B
- 4 D
- 5 D
- 6 D
- 7 B
- 8 D
- 9 D
- 10 A

Structured questions answers

- 11 Seven and two-thirds
- 12 $10\frac{1}{2}$

- 13 a $5\frac{1}{6}, 5\frac{1}{5}, 5\frac{1}{4}, 5\frac{1}{3}$
 b $3\frac{2}{3}, 4\frac{1}{4}, 6\frac{1}{9}, 7\frac{1}{3}$
- 14 a $10\frac{1}{5}, 9\frac{1}{4}, 8\frac{2}{3}, 6\frac{1}{3}$
 b $8\frac{5}{6}, 8\frac{2}{3}, 8\frac{1}{4}, 8\frac{1}{7}$
- 15 a <
 b >
 c >
 d <

Unit 5: Decimal numbers

Unit objectives

By the end of this unit, learners should be able to:

- a read and write decimals up to one decimal place.
- b relate fractions with denominators 10 and 100 to decimals.
- c identify the place value of digits in decimals.
- d compare decimals.
- e write decimals in expanded form.
- f arrange decimals in ascending and descending order.
- g round off decimals to the nearest unit and tenth.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 60–72.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 5.1

Learners take turns to read the following numbers:

- | | |
|------------------|---------------------|
| 1 3,1: 3 comma 1 | 6 7,6: 7 comma 6 |
| 2 4,3: 4 comma 3 | 7 8,2: 8 comma 2 |
| 3 5,7: 5 comma 7 | 8 10,3: 10 comma 3 |
| 4 6,8: 6 comma 8 | 9 15,5: 15 comma 5 |
| 5 8,9: 8 comma 9 | 10 22,4: 22 comma 4 |

Exercise 5.1

- 1 4
- 2 8
- 3 9
- 4 9
- 5 8

- 6 11
- 7 15
- 8 15
- 9 18
- 10 20

Activity 5.2

- 1 $\frac{1}{5}$
- 2 $\frac{3}{10}$
- 3 $\frac{6}{10}$
- 4 $\frac{8}{10}$
- 5 $\frac{7}{10}$
- 6 $\frac{3}{10}$
- 7 $\frac{6}{10}$
- 8 $\frac{5}{10}$

- 9 $\frac{4}{10}$
- 10 $\frac{3}{10}$
- 11 $\frac{8}{10}$
- 12 $\frac{5}{10}$
- 13 $\frac{5}{10}$
- 14 $\frac{3}{10}$
- 15 $\frac{5}{10}$

Activity 5.3

- a $\frac{1}{10}$
- b One tenth

Exercise 5.2

- 1 0,2
- 2 0,3
- 3 0,4
- 4 0,5

- 5 0,6
- 6 0,7
- 7 0,8
- 8 0,9

Activity 5.4

- 1 0,03
- 2 0,08
- 3 0,10
- 4 0,15

- 5 0,20
- 6 0,25
- 7 0,30

Exercise 5.3

1 Conversions:

a 0,40

b 0,45

c 0,48

d 0,50

e 0,52

f 0,55

2 0,44

3 0,37

4 0,61

Activity 5.5

1 2 tenths

2 4 units

3 8 tenths

4 1 is 1 ten

5 2 is 2 units

6 7 is 7 tenths

Activity 5.6

1 $1,2 < 1,5$

2 $4,5 < 4,9$

3 $5,3 > 5,1$

4 $6,8 > 6,0$

5 $8,2 > 8,1$

6 $10,1 < 10,8$

7 $24,3 < 24,8$

8 $31,3 < 31,4$

Activity 5.7

1 $3,5 > 2,5$

2 $5,7 > 4,7$

3 $6,9 < 7,9$

4 $11,3 < 12,3$

5 $23,5 > 21,5$

6 $34,1 > 33,1$

7 $41,5 > 40,5$

8 $51,6 < 56,3$

Activity 5.8

1 $5 + 0,7$

2 $8 + 0,$

3 $9 + 0,5$

4 $6 + 0,5$

5 $8 + 0,7$

6 $9 + 0,8$

Exercise 5.4

1 $10 + 8 + 0,2$

2 $20 + 3 + 0,7$

3 $30 + 3 + 0,5$

4 $40 + 5 + 0,8$

5 $60 + 2 + 0,7$

6 $80 + 8 + 0,6$

Exercise 5.5

1 2,1; 2,2; 2,3; 2,5

2 5,3; 5,4; 5,5; 5,9

3 8,1; 8,2; 8,6; 8,7

4 7,3; 7,5; 7,6; 7,7

5 8,0; 8,1; 8,5; 8,9

Exercise 5.6

1 2,5; 2,3; 2,1; 2,0

2 4,8; 4,7; 4,5; 4,1

3 8,9; 8,5; 8,3; 8,1

4 9,8; 9,7; 9,6; 9,5

5 10,8; 10,5; 10,4; 10,3

Exercise 5.7

1 1,3: 1,0

2 4,5: 5,0

3 5,6: 6,0

4 6,6: 7,0

5 7,3: 7,0

6 8,4: 8,0

7 10,5: 11,0

8 12,3: 12,0

Exercise 5.8

1 2,3

2 4,1

3 7,3

4 8,4

5 9,1

6 9,3

7 10,4

8 15,3

7 $90 + 0,4$

8 $100 + 0,6$

6 11,2; 11,3; 11,5; 11,9

7 15,2; 15,3; 15,6; 15,8

8 20,1; 20,3; 20,5; 20,7

9 40,4; 40,6; 40,7; 40,9

10 100,3; 100,4; 100,7; 100,9

6 12,6; 12,5; 12,4; 12,3

7 18,8; 18,7; 18,6; 18,3

8 25,6; 25,5; 25,4; 25,3

9 40,7; 40,5; 40,3; 40,1

10 80,6; 80,5; 80,4; 80,3

9 15,7: 16,0

10 25,3: 25,0

11 33,7: 34,0

12 45,3: 45,0

13 50,8: 51,0

14 63,7: 64,0

15 87,6: 88,0

9 18,4

10 24,1

11 33,6

12 40,7

13 61,1

14 80,3

15 100,6

Unit revision exercises

Multiple choice answers

- | | | | |
|-----|-----|-----|------|
| 1 A | 4 B | 7 D | 10 B |
| 2 C | 5 B | 8 D | |
| 3 D | 6 B | 9 C | |

Structured questions answers

- 11 a 0,4
b 0,5
c 0,15
d 0,55
- 12 a $2 + 0,3$
b $20 + 5 + 0,2$
c $30 + 3 + 0,2$
d $40 + 5 + 0,6$
- 13 a 2,5
b 5,8
c 12,9
d 45,21
- 14 a 5
b 23
- 15 a 25,5
b 56,1
- 16 a 5,0; 5,1; 5,3; 5,6
b 14,5; 25,3; 33,1; 47,2
- 17 a 17,7; 17,4; 17,3; 17,1
b 63,1; 52,0; 44,2; 31,5

Unit 6: Percentages

Unit objectives

By the end of this unit, learners should be able to:

- a read fractions with a denominator of 100.
- b write fractions with a denominator of 100.
- c express halves, quarters, fifths and tenths as percentages.
- d use 100 square grids to express fractions as percentages.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 73–80.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 6.1

- | | |
|------------|-------------|
| 1 13 parts | 9 87 parts |
| 2 18 parts | 10 53 parts |
| 3 32 parts | 11 63 parts |
| 4 47 parts | 12 46 parts |
| 5 49 parts | 13 27 parts |
| 6 62 parts | 14 29 parts |
| 7 74 parts | 15 52 parts |
| 8 82 parts | |

Exercise 6.1

- 1 40%
- 2 80%
- 3 65%
- 4 14%
- 5 40%

Activity 6.2

- | | |
|--------------------|---------------------|
| 1 $\frac{3}{100}$ | 9 $\frac{33}{100}$ |
| 2 $\frac{7}{100}$ | 10 $\frac{45}{100}$ |
| 3 $\frac{11}{100}$ | 11 $\frac{54}{100}$ |
| 4 $\frac{22}{100}$ | 12 $\frac{78}{100}$ |
| 5 $\frac{44}{100}$ | 13 $\frac{96}{100}$ |
| 6 $\frac{63}{100}$ | 14 $\frac{73}{100}$ |
| 7 $\frac{82}{100}$ | 15 $\frac{84}{100}$ |
| 8 $\frac{10}{100}$ | |

Exercise 6.2

- | | | |
|-------|-------|-------|
| 1 20% | 3 50% | 5 80% |
| 2 38% | 4 61% | 6 76% |

Activity 6.3

- | | |
|-------|-------|
| 1 40% | 4 50% |
| 2 10% | 5 70% |
| 3 30% | |

Exercise 6.3

- 1
- a 60%
 - b 75%
 - c 55%
 - d 20%
 - e 100%
 - f 45%
- 2 60%
- 3 30%
- 4 70%
- 5 80%
- 6 70%
- 7 40%

Exercise 6.4

- | | |
|-------|--------|
| 1 50% | 5 75% |
| 2 60% | 6 100% |
| 3 30% | 7 80% |
| 4 50% | 8 90% |

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 A | 6 B |
| 2 A | 7 D |
| 3 D | 8 D |
| 4 C | 9 C |
| 5 D | 10 C |

Structured questions answers

- 11
- a 37%
 - b 80%
 - c 36%
 - d 80%

- e** 45%
- 12 a** $\frac{25}{100}$
- b** $\frac{54}{100}$ or $\frac{27}{50}$
- c** $\frac{37}{50}$
- d** $\frac{81}{100}$
- e** $\frac{93}{100}$
- 13** 23%
- 14** 46%
- 15 a** 16%
- b** 12%
- c** 30%
- d** 6%
- e** 36%
- 16 a** Shopping and discounts: Percentages help us calculate how much money we save during a sale (for example, “50% off”).
- b** Tracking progress: They are used in schools to show how well a learner performed on a test (for example, scoring 80% on a Mathematics examination).
- c** Financial interest: Banks use percentages to show how much interest you earn on savings or pay on loans.

Topic 2

Operations

Unit 7: Addition of whole numbers

Unit objective

By the end of this unit, learners should be able to:

- a add within the range, including carrying up to two times.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 81–89.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 7.1

- | | |
|-------|-------|
| 1 891 | 4 494 |
| 2 571 | 5 383 |
| 3 790 | 6 673 |

Exercise 7.1

- | | |
|-------|-------|
| 1 362 | 4 381 |
| 2 482 | 5 700 |
| 3 594 | 6 553 |

Activity 7.2

- | | |
|-------|-------|
| 1 911 | 4 634 |
| 2 621 | 5 623 |
| 3 830 | 6 843 |

Exercise 7.2

- | | | |
|---------------|---------------|-----------------|
| 1 620 | 3 823 plants | 5 1 063 animals |
| 2 421 schools | 4 745 bottles | 6 827 animals |

Activity 7.3

- 1 671
- 2 271
- 3 360

- 4 394
- 5 493
- 6 674

Exercise 7.3

- 1 4 671
- 2 5 682
- 3 4 690

- 4 9 681
- 5 5 691 plants
- 6 7 471 packets

Activity 7.4

- 1 7 912
- 2 6 911
- 3 5 021

- 4 4 914
- 5 4 931
- 6 6 913

Exercise 7.4

- 1 5 805
- 2 6 614
- 3 4 639 insects

- 4 4 826 plants
- 5 4 837 learners
- 6 3 541 vehicles

Activity 7.6

- 1 491c
- 2 \$491
- 3 512c
- 4 \$6 331
- 5 3 703 m

- 6 3 285 km
- 7 4 744 km
- 8 3 490 seconds
- 9 3 637 ml
- 10 505 g

Exercise 7.6

- 1 932 m
- 2 611 m
- 3 830 m
- 4 636 hr
- 5 613 sec
- 6 841 hrs
- 7 714 hr
- 8 956 sec

- 9 945 sec
- 10 6604 g
- 11 8 848 kg
- 12 6 854 kg

Unit revision exercises

Multiple choice answers

- | | | | |
|-----|-----|-----|------|
| 1 C | 4 B | 7 B | 10 B |
| 2 D | 5 C | 8 A | 11 A |
| 3 D | 6 B | 9 B | |

Structured questions answers

- 12 a 10 ml
b 1 312 hr
c 5 576 km
- 13 5 813
14 6 732
15 2 369c
16 482 m
17 2 508 ml

Test 1

Paper 1: Multiple choice answers

- | | | | |
|------|------|------|------|
| 1 B | 14 D | 27 C | 40 B |
| 2 D | 15 C | 28 D | 41 A |
| 3 A | 16 A | 29 C | 42 C |
| 4 D | 17 D | 30 A | 43 B |
| 5 C | 18 B | 31 A | 44 A |
| 6 B | 19 B | 32 C | 45 B |
| 7 C | 20 C | 33 C | 46 C |
| 8 B | 21 B | 34 D | 47 D |
| 9 A | 22 C | 35 B | 48 D |
| 10 A | 23 A | 36 C | 49 C |
| 11 D | 24 C | 37 C | 50 A |
| 12 D | 25 D | 38 C | |
| 13 D | 26 D | 39 D | |

Paper 2

Section A

- 1 Eight hundred and sixty-seven
- 2
 - a 323
 - b 999
- 3
 - a 35
 - b 487
- 4
 - a 180
 - b 0,9
- 5
 - a 26
 - b 62
- 6
 - a $3\frac{2}{3}$
 - b $\frac{1}{2}$
- 7
 - a 151
 - b 753
- 8
 - a 150
 - b \$4,50
- 9 24 cm²
- 10 4 days

Section B

- 11
 - a \$48,00
 - c \$94,00
- 12
 - a 6 o' clock
 - b 120 minutes
- 13
 - a 200 trees
 - b 3 000 litres
- 14
 - a 27 cm³
 - b 3 cm
- 15
 - a $4\frac{4}{9}$
 - b $(6 \times 4) \times 3$
 - c 7×5

Unit 8: Subtraction of whole numbers (0 – 10 000)

Unit objective

By the end of this unit, learners should be able to:

- a subtract whole numbers.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 97–104.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 8.1

- | | |
|-------|--------|
| 1 389 | 6 189 |
| 2 489 | 7 189 |
| 3 587 | 8 188 |
| 4 689 | 9 389 |
| 5 509 | 10 189 |

Exercise 8.2

- | | |
|---------|-------|
| 1 | a 509 |
| | b 399 |
| | c 199 |
| | d 374 |
| 2 672 | |
| 3 158 | |
| 4 348 | |
| 5 1 778 | |

Activity 8.3

- | | |
|---------|---------|
| 1 2 869 | 5 2 889 |
| 2 1 889 | 6 2 889 |
| 3 2 892 | 7 1 889 |
| 4 3 889 | 8 3 889 |

Exercise 8.3

- 1 2 695
- 2 3 788
- 3 1 888
- 4 Difference: 4 389
Minuend: 5 678
Subtrahend: 1 289
- 5 $5\,642 - 1\,255 = 4\,387$

Activity 8.3

- | | |
|-----------------|----------------|
| 1 \$89 | 4 1 279 metres |
| 2 \$3 381 | 5 309 litres |
| 3 1 078 minutes | |

Exercise 8.4

- | | |
|---------------|-----------------|
| 1 \$3 379 | 6 2 089 km |
| 2 \$2 187 | 7 38 g |
| 3 \$265 | 8 307 kg |
| 4 139 seconds | 9 439 litres |
| 5 1 289 m | 10 3 389 litres |

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 B | 6 B |
| 2 A | 7 A |
| 3 A | 8 B |
| 4 B | 9 A |
| 5 D | 10 C |

Structured questions answers

- 11 a 7
b 7
c 1 089
d 457 kg
- 12 106
- 13 3 438 litres
- 14 236 m
- 15 139 tomatoes

- 16 3 448 km
- 17 329 cents lost
- 18 \$311 gained

Unit 9: Multiplication of whole numbers

Unit objectives

By the end of this unit, learners should be able to:

- a demonstrate multiplication facts by single digits.
- b multiply where carrying is involved.
- c calculate factors of numbers between 1 and 100.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 105–116.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 9.1

- 1 $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$
- 2 $3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$
- 3 $20 + 20 + 20 + 20$
- 4 $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$
- 5 $6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6$
- 6 $7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7$
- 7 $8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8$
- 8 $9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9$
- 9 $10 + 10$

Exercise 9.1

- | | |
|-------------|--------------|
| 1 48 | 4 24 books |
| 2 90 | 5 200 pupils |
| 3 40 cattle | 6 100 people |

Activity 9.2

- | | |
|------|------|
| 1 2 | 3 30 |
| 2 12 | 4 18 |

- 5 28
- 6 40
- 7 45

Exercise 9.3

- 1 24
- 2 24
- 3 16

Activity 9.4

- 1 42
- 2 30
- 3 48
- 4 68
- 5 95

Exercise 9.4

- 1 78
- 2 54
- 3 161

Activity 9.4

- 1 342
- 2 230
- 3 348
- 4 468

Exercise 9.5

- 1 560
- 2 642
- 3 672

Activity 9.5

- 1 1500
- 2 428
- 3 975
- 4 868

- 8 42
- 9 49
- 10 64

- 4 20
- 5 18

- 6 50
- 7 78
- 8 81
- 9 56
- 10 87

- 4 90
- 5 48
- 6 42

- 5 450
- 6 678
- 7 681
- 8 456

- 4 892
- 5 236
- 6 856

- 5 1688
- 6 434
- 7 681
- 8 900

Activity 9.6

- | | |
|-------|-------|
| ① 462 | ⑤ 550 |
| ② 330 | ⑥ 768 |
| ③ 528 | ⑦ 741 |
| ④ 548 | ⑧ 516 |

Exercise 9.6

- | | |
|-------|-------|
| ① 468 | ④ 572 |
| ② 567 | ⑤ 762 |
| ③ 468 | ⑥ 910 |

Activity 9.7

- | | |
|-----------|-----------------|
| ① \$36 | ③ 3 768 minutes |
| ② \$3 768 | ④ 492 minutes |

Exercise 9.9

- | | |
|----------|----------|
| ① 908c | ⑤ 78 g |
| ② 732 mm | ⑥ 351 kg |
| ③ 441c | ⑦ 714 l |
| ④ 536c | ⑧ 357 |

Activity 9.8

- | | |
|----------------------|--|
| ① 1, 11 | ⑨ 1, 2, 4, 5, 8, 10, 20, 40 |
| ② 1, 2, 3, 6 | ⑩ 1, 3, 5, 9, 15, 45 |
| ③ 1, 7 | ⑪ 1, 5, 11, 55 |
| ④ 1, 2, 3, 4, 6, 12 | ⑫ 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 |
| ⑤ 1, 2, 3, 6, 9, 18 | ⑬ 1, 5, 13, 65 |
| ⑥ 1, 2, 11, 22 | ⑭ 1, 2, 5, 7, 10, 14, 35, 70 |
| ⑦ 1, 2, 4, 7, 14, 28 | ⑮ 1, 2, 4, 5, 8, 10, 16, 20, 40, 80 |
| ⑧ 1, 5, 7, 35 | |

Unit revision exercises

Multiple choice answers

- | | |
|-----|-----|
| ① D | ⑥ D |
| ② C | ⑦ B |
| ③ D | ⑧ A |
| ④ A | ⑨ C |
| ⑤ B | ⑩ B |

Structured questions answers

- 11 a 24 b 625 ml c 768 km d 3 762
- 12 Factors of 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48
- 13 a 2, 7 b 2, 13 c 2, 3, 5 d 5 e 2, 5 f 2, 3, 5
- 14 $\$125 \times 3 = \375
- 15 a 348 kg b 236 g c 452 km

Unit 10: Division of whole numbers

Unit objectives

By the end of this unit, learners should be able to:

- a divide whole numbers by one-digit number.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 117–125.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Exercise 10.1

- | | |
|-----|-----|
| 1 1 | 5 3 |
| 2 4 | 6 4 |
| 3 6 | 7 5 |
| 4 2 | |

Activity 10.1

- | | |
|-----------|-----------|
| 1 2 times | 6 6 times |
| 2 2 times | 7 2 times |
| 3 2 times | 8 2 times |
| 4 2 times | 9 2 times |
| 5 2 times | |

Exercise 10.2

No.	Dividend	Divisor	Quotient
1	3	3	1
2	5	1	5
3	8	4	2

4	10	5	2
5	10	2	5
6	15	3	5
7	15	5	3
8	20	10	2
9	35	7	5
10	30	10	3
11	30	3	10
12	35	5	7
13	30	15	2
14	40	20	2
15	50	25	2
16	100	25	4

Exercise 10.3

- | | | | |
|---|---|----|---|
| 1 | 4 | 9 | 2 |
| 2 | 5 | 10 | 3 |
| 3 | 4 | 11 | 2 |
| 4 | 4 | 12 | 2 |
| 5 | 6 | 13 | 6 |
| 6 | 3 | 14 | 5 |
| 7 | 6 | 15 | 5 |
| 8 | 3 | | |

Exercise 10.4

- 1
- a 1 rem 1
 - b 1 rem 2
 - c 3 rem 1
 - d 3 rem 4
 - e 5 rem 1
 - f 4 rem 2
 - g 3 rem 2
 - h 3 rem 4
 - i 4 rem 1

- 2 a 4 rem 2
 b 6 rem 2
 c 6 rem 5
- 3 a 6 rem 4
 b 6 rem 2
 c 8 rem 4

Activity 10.2

- | | |
|---------|--------|
| 1 72 | 5 84 |
| 2 121 | 6 96 |
| 3 85 | 7 96 |
| 4 67 | 8 88 |

Exercise 10.5

- | | |
|--------------------------|--------------------------|
| 1 175 | 5 84 |
| 2 101.5 (or 101 rem 2) | 6 115.5 (or 115 rem 3) |
| 3 58 | 7 116 days |
| 4 89 | 8 140 seedlings |

Activity 10.3

- | | |
|----------|----------------|
| 1 \$71 | 4 104 litres |
| 2 \$10 | 5 131 m |
| 3 4g | |

Exercise 10.6

- | | |
|------------------------------|------------|
| 1 \$84 each, remainder \$1 | 4 212 kg |
| 2 \$120 | 5 105 kg |
| 3 5 minutes | |

Unit revision exercises

Multiple choice answers

- | | |
|--------|---------------------|
| 1 D | 6 A |
| 2 C | 7 D |
| 3 A | 8 0 kg |
| 4 C | 9 D |
| 5 45 | 10 52 remainder 7 |

Structured questions answers

- 11 a 21 b 11
12 11
13 a 1 b 5,125 litres
14 6 kg each, remainder 5 kg
15 51 litres each, remainder 4 litres
16 40 packets

Unit 11: Multiplication of proper fractions

Unit objectives

By the end of this unit, learners should be able to:

- a multiply proper fractions.
b calculate fractions of whole numbers.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 126–131.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Exercise 11.1

- | | |
|-------------------|--------------------|
| 1 $\frac{1}{3}$ | 7 $\frac{21}{100}$ |
| 2 $\frac{1}{5}$ | 8 $\frac{3}{7}$ |
| 3 $\frac{4}{15}$ | 9 $\frac{28}{45}$ |
| 4 $\frac{24}{35}$ | 10 $\frac{28}{45}$ |
| 5 $\frac{10}{21}$ | 11 $\frac{24}{35}$ |
| 6 $\frac{6}{125}$ | 12 $\frac{15}{28}$ |

Exercise 11.2

- | | |
|------------------|------------------|
| 1 $\frac{2}{5}$ | 4 $2\frac{1}{7}$ |
| 2 $2\frac{2}{5}$ | 5 $3\frac{4}{4}$ |
| 3 4 | 6 $5\frac{1}{3}$ |

Activity 11.1

- 1 $\frac{1}{6}$
- 2 $\frac{1}{10}$
- 3 $\frac{1}{8}$
- 4 $\frac{5}{12}$
- 5 $\frac{6}{49}$
- 6 $\frac{3}{25}$

- 7 $\frac{56}{81}$
- 8 $\frac{27}{100}$
- 9 $\frac{55}{72}$
- 10 $\frac{50}{169}$
- 11 $\frac{3}{20}$
- 12 $\frac{4}{13}$

Exercise 11.3

- 1 3
- 2 3
- 3 160
- 4 27
- 5 25
- 6 2
- 7 6
- 8 25

- 9 60
- 10 40
- 11 90
- 12 250
- 13 400
- 14 720
- 15 510

Exercise 11.4

- 1
 - a 480
 - b 200
- 2 8 black cattle.
- 3 15 boys
- 4 80 blind people.
- 5 2 girls
- 6 32 women.

Activity 11.2

- 1 10
- 2 40 c
- 3 200
- 7
 - a $26\frac{2}{3}$ m
 - b 7 km
- 8
 - a 56 ml
 - b 24 km

- 4 250 h
- 5 10 m
- 6 1 600 km

Exercise 11.5

- | | |
|---------|------------|
| 1 \$100 | 4 16 hours |
| 2 \$20 | 5 32 hours |
| 3 \$250 | |

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 B | 6 A |
| 2 C | 7 B |
| 3 B | 8 A |
| 4 C | 9 A |
| 5 B | 10 A |

Structured questions answers

- 11 a $\frac{5}{12}$
b $\frac{3}{25}$
- 12 a 14
b 80
- 13 a \$100
b 100 cents
- 14 a 700 ml
b 350 litres
- 15 a 240 km
b 630 metres

Unit 12: Highest Common Factor (HCF) and Lowest Common Multiple (LCM)

Unit objectives

By the end of this unit, learners should be able to:

- a find the Highest Common Factor (HCF) of two numbers (where the HCF is less than 10).
- b find the Lowest Common Multiple (LCM) of two numbers (where the LCM is less than 50).

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 132–138.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 12.1

- 1 a 16; 8; 4
b 18; 6; 3
- 2 a 15: 1, 3, 5, 15
b 24: 1, 2, 3, 4, 6, 8, 12, 24
c 30: 1, 2, 3, 5, 6, 10, 15, 30

Exercise 12.1

- 1 a 1, 2, 4, 8
b 1, 2, 5, 10
c 1, 2, 7, 14
d 1, 5, 25
- 2 a 3
d 6
e 6
- 3 4 and 9

Activity 12.2

- 1 Factors of 10: 1, 2, 5, 10
Factors of 15: 1, 3, 5, 15
- 2 1 and 5.

Exercise 12.2

- 1 1, 3 2 1, 2, 4 3 1, 2, 3, 6 4 1, 3

Activity 12.3

- a 2 b 3 c 5

Exercise 12.3

- 1 3 4 9
2 4 5 4
3 5 6 6

Activity 12.4

- 1
 - a 3, 6, 9, 12, 15
 - b 5, 10, 15, 20, 25
 - c 7, 14, 21, 28, 35
- 2
 - Multiples increase by adding the same number each time.
 - Multiples of a number are evenly spaced.
 - Each multiple is the given number multiplied by 1, 2, 3, 4, ...

Exercise 12.4

- 1
 - a 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
 - b 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
 - c 4, 8, 12, 16, 20, 24, 28, 32, 36, 40
- 2 6, 12, 18, 24, 30, 36

Activity 12.5

- 1 15, 30, 45
- 2 Common multiples of 2 and 5
10, 20, 30, 40

Exercise 12.5

- 1 15, 30, 45
- 2 12, 24, 36, 48
- 3 10, 20, 30, 40
- 4 18, 36

Activity 12.6

- a 6
- b 30
- c 8

Exercise 12.6

- 1 12
- 2 10
- 3 24
- 4 36
- 5 10
- 6 6

Unit revision exercises

Multiple choice answers

- 1 C
- 2 A
- 3 B
- 4 C
- 5 C

Structured questions answers

- 6 a 1, 3, 9
b 1, 3, 5, 15
c 1, 2, 4, 5, 10, 20
- 7 a 1, 2
b 1, 3
- 8 a 4
b 3
c 10
- 9 a 3, 6, 9, 12, 15
b 4, 8, 12, 16, 20
c 5, 10, 15, 20, 25
- 10 a 6
b 12
c 10

Unit 13: Addition of proper fractions

Unit objective

By the end of this unit, learners should be able to:

- a add up to three proper fractions with the same denominator.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 139–146.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 13.1

Learners write down 20 proper fractions they can think of, exemplified by the following proper

fractions: 1 $\frac{1}{2}$ 2 $\frac{1}{3}$ 3 $\frac{1}{4}$ 4 $\frac{1}{5}$ 5 $\frac{1}{6}$ 6 $\frac{1}{7}$ 7 $\frac{2}{3}$ 8 $\frac{2}{5}$ 9 $\frac{2}{7}$ 10 $\frac{2}{9}$
11 $\frac{3}{4}$ 12 $\frac{3}{5}$ 13 $\frac{3}{7}$ 14 $\frac{3}{8}$ 15 $\frac{3}{10}$ 16 $\frac{4}{5}$ 17 $\frac{4}{7}$ 18 $\frac{4}{9}$ 19 $\frac{5}{6}$ 20 $\frac{7}{10}$

Exercise 13.1

- ① $\frac{1}{3}$ ② $\frac{1}{3}$ ③ $\frac{2}{3}$ ④ $\frac{3}{18}$
⑤ $\frac{5}{6}$ ⑥ $\frac{3}{6}$ ⑦ $\frac{2}{6}$ ⑧ $\frac{5}{18}$

Exercise 13.2

- ① $\frac{5}{8}$ ⑦ $\frac{28}{30}$
② $\frac{8}{9}$ ⑧ $\frac{25}{35}$
③ $\frac{9}{10}$ ⑨ $\frac{25}{45}$
④ $\frac{9}{15}$ ⑩ $\frac{15}{50}$
⑤ $\frac{15}{20}$ ⑪ $\frac{70}{80}$
⑥ $\frac{16}{21}$ ⑫ $\frac{90}{100}$

Activity 13.2

- ① $\frac{2}{4}$ ④ $\frac{13}{15}$
② $\frac{3}{6}$ ⑤ $\frac{4}{6}$
③ $\frac{3}{6}$ ⑥ $\frac{8}{15}$

Exercise 13.3

- ① $1\frac{1}{2}$ ⑤ $\frac{11}{13}$
② $\frac{9}{10}$ ⑥ $\frac{22}{35}$
③ $\frac{12}{15}$ ⑦ $\frac{35}{40}$
④ $\frac{18}{20}$ ⑧ $\frac{34}{45}$

Exercise 13.4

- ① $\frac{4}{2}$ or 2 ⑦ $\frac{10}{10}$ or 1
② $\frac{4}{4}$ or 1 ⑧ $\frac{6}{2}$ or 3
③ $\frac{4}{5}$ ⑨ $\frac{7}{4}$ or $1\frac{3}{4}$
④ $\frac{9}{10}$ ⑩ $\frac{8}{5}$ or $1\frac{3}{5}$
⑤ $\frac{6}{4}$ or $1\frac{1}{2}$ ⑪ $\frac{8}{10}$
⑥ $\frac{9}{5}$ or $1\frac{4}{5}$ ⑫ $\frac{6}{4}$ or $1\frac{1}{2}$

13 $\frac{6}{10}$

14 $\frac{9}{5}$ or $1\frac{4}{5}$

15 $\frac{4}{2}$ or 2

Activity 13.3

1 $\frac{5}{6}$

2 $\frac{5}{6}$

3 $\frac{6}{9}$

4 $\frac{14}{15}$

Exercise 13.5

1 $\frac{8}{10}$

2 $\frac{14}{17}$

3 $\frac{17}{20}$

4 $\frac{15}{18}$

5 $\frac{12}{16}$

6 $\frac{30}{35}$

7 $\frac{83}{100}$

8 $\frac{22}{25}$

Unit revision exercises

Multiple choice answers

1 B

2 C

3 D

4 A

5 B

6 A

7 D

8 B

9 B

10 B

Structured questions answers

1 $\frac{3}{6}$

2 $\frac{12}{15}$

3 $\frac{10}{14}$

4 $\frac{11}{20}$

5 $\frac{17}{25}$

6 $\frac{12}{15}$

Unit 14: Subtraction of proper fractions

Unit objective

By the end of this unit, learners should be able to:

- a subtract proper fractions with the same denominators.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 147–152.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 14.1

- 1 $\frac{2}{4}$
- 2 $\frac{2}{5}$
- 3 $\frac{4}{10}$
- 4 $\frac{1}{4}$
- 5 $\frac{2}{10}$
- 6 $\frac{2}{5}$
- 7 $\frac{1}{2}$
- 8 $\frac{4}{10}$

- 9 $\frac{4}{4}$
- 10 $\frac{4}{5}$
- 11 $\frac{5}{10}$
- 12 $\frac{3}{4}$
- 13 $\frac{2}{5}$
- 14 $\frac{4}{10}$
- 15 $\frac{4}{4}$

Exercise 14.1

- 1 $\frac{1}{4}$
- 2 $\frac{3}{5}$
- 3 $\frac{2}{5}$
- 4 $\frac{1}{2}$
- 5 $\frac{3}{10}$

- 6 $\frac{1}{4}$
- 7 $\frac{2}{5}$
- 8 $\frac{2}{5}$
- 9 $\frac{1}{5}$

Exercise 4.2

- 1 $\frac{3}{8}$
- 2 $\frac{3}{9}$
- 3 $\frac{3}{6}$
- 4 $\frac{3}{5}$
- 5 $\frac{2}{4}$

- 6 $\frac{6}{8}$
- 7 $\frac{9}{12}$
- 8 $\frac{2}{8}$
- 9 $\frac{4}{11}$

Exercise 14.3

- 1 $\frac{2}{8}$
- 2 $\frac{2}{4}$
- 3 $\frac{1}{10}$
- 4 $\frac{1}{10}$

- 5 $\frac{5}{10}$
- 6 $\frac{2}{15}$
- 7 $\frac{2}{9}$

Activity 14.2

- | | |
|------------------|-------------------|
| 1 $\frac{0}{4}$ | 9 $\frac{2}{10}$ |
| 2 $\frac{0}{5}$ | 10 $\frac{2}{10}$ |
| 3 $\frac{1}{10}$ | 11 $\frac{6}{10}$ |
| 4 $\frac{1}{10}$ | 12 $\frac{2}{5}$ |
| 5 $\frac{2}{5}$ | 13 $\frac{2}{4}$ |
| 6 $\frac{2}{10}$ | 14 $\frac{1}{10}$ |
| 7 $\frac{1}{4}$ | 15 $\frac{1}{5}$ |
| 8 $\frac{2}{5}$ | |

Exercise 14.4

- 1 a $\frac{1}{5}$ b $\frac{3}{5}$
- 2 $\frac{1}{5}$
- 3 $\frac{3}{10}$
- 4 Since this is more than one whole, no bananas remained.
- 5 $\frac{1}{10}$
- 6 Fraction unplanted: 0
- 7 $\frac{3}{20}$
- 8 $\frac{12}{10}$ This exceeds one whole, so all learners can do at least one activity.
Fraction of learners who cannot do any: 0

Unit revision exercises

Multiple choice answers

- | | | | |
|-----|-----|-----|------|
| 1 B | 4 D | 7 B | 10 B |
| 2 C | 5 B | 8 C | |
| 3 B | 6 C | 9 B | |

Structured questions answers

- | | | |
|-------------------|-------------------|-------------------|
| 11 $\frac{5}{10}$ | 14 $\frac{3}{10}$ | 17 $\frac{2}{4}$ |
| 12 $\frac{5}{10}$ | 15 $\frac{1}{5}$ | 18 $\frac{3}{10}$ |
| 13 $\frac{2}{10}$ | 16 $\frac{3}{10}$ | |

Unit 15: Addition of decimals

Unit objective

By the end of this unit, learners should be able to:

- a add decimals.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 153–158.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 15.1

- | | |
|--------------|--------------|
| 1 5 = Tenths | 6 2 = Units |
| 2 3 = Units | 7 5 = Tenths |
| 3 5 = Units | 8 3 = Units |
| 4 7 = Tenths | 9 5 = Tens |
| 5 7 = Tenths | 10 2 = Tens |

Exercise 15.1

- | | |
|----------------|------------|
| 1 2 Units | 4 6 Tens |
| 2 5 Hundredths | 5 5 Tenths |
| 3 3 Tenths | |

Activity 15.2

The following are written to 1 decimal place:

- | | |
|---------|----------|
| 1 2,0 | 16 75,0 |
| 3 4,7 | 17 112,3 |
| 4 5,6 | 18 136,0 |
| 5 12,5 | 20 325,5 |
| 10 45,8 | 23 268,9 |
| 12 86,5 | 25 854,7 |

Exercise 15.2

- | | |
|--------------------|--------------------|
| 1 1 decimal place. | 4 1 decimal place. |
| 2 36,5 | 5 253,7 |
| 3 235,7 | |

Activity 15.3

- | | |
|--------|----------|
| 1 8,7 | 9 99,9 |
| 2 9,9 | 10 89,9 |
| 3 9,4 | 11 359,7 |
| 4 7,0 | 12 337,1 |
| 5 8,8 | 13 803,1 |
| 6 3,8 | 14 799,1 |
| 7 37,6 | 15 809,2 |
| 8 38,8 | |

Exercise 15.3

- | | | | | |
|----------|--------|--------|---------|---------|
| 1 a 88,7 | b 59,6 | c 66,5 | d 370,7 | e 548,8 |
| 2 446,1 | | | | |
| 3 610,5 | | | | |
| 4 1376,5 | | | | |
| 5 666,8 | | | | |
| 6 462,0 | | | | |

Activity 15.4

- | | |
|---------|---------|
| 1 \$6.8 | 4 \$8.7 |
| 2 \$8.8 | 5 \$9.1 |
| 3 \$9.5 | |

Exercise 15.4

- | | |
|----------------|----------------|
| 1 \$35.00 | 6 80,1 minutes |
| 2 \$720.20 | 7 13,3 kg |
| 3 \$690.10 | 8 304,6 kg |
| 4 38,1 seconds | 9 1 349,3 kg |
| 5 677,9 hours | 10 145,9 ml |

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 C | 6 C |
| 2 C | 7 A |
| 3 A | 8 A |
| 4 A | 9 D |
| 5 A | 10 C |

Structured questions answers

- 11 a 169,8 b 113,0 c 202,8
12 10,1 hours
13 128,0 litres
14 670,3 metres
15 49,8 kg
16 80,8 seconds

Unit 16: Subtraction of decimals

Unit objective

By the end of this unit, learners should be able to:

- a subtract decimals.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 159–168.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 16.1

- | | |
|--------|----------|
| 1 0,2 | 6 54,6 |
| 2 1,8 | 7 14,3 |
| 3 41,8 | 8 215,4 |
| 4 22,1 | 9 311,9 |
| 5 30,9 | 10 108,9 |

Exercise 16.1

- 1 • 11,2
• 23,3
• 498,2
2 • 22,9
• 411,6
3 13,4
4 222,5
5 332,1

Activity 16.2

- 1 \$2.2
- 2 \$3.2
- 3 \$5.3
- 4 \$1.3
- 5 \$0.5
- 6 5,1 litres
- 7 309,5 ml
- 8 220,9 litres
- 9 318,8 km
- 10 111,3 metres

Exercise 16.2

- 1 16,9 minutes
- 2 239,1 kg
- 3 237,9 metres
- 4 322,5 mm
- 5 430,8 cm

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 B | 6 B |
| 2 D | 7 A |
| 3 D | 8 D |
| 4 A | 9 A |
| 5 C | 10 C |

Structured questions answers

- 11
 - a 20,3
 - b 428,9 m
 - c 191,92 kg
- 12
 - a $875,25 - 578,62 = 296,63$ kg
 - b $465,15 - 354,70 = 110,45$ g
- 13 32,91 kg
- 14 231,09 g
- 15 42,36 mm
- 16 223,10 metres

Test 2

Paper 1: Multiple choice answers

- | | | | |
|------|------|------|------|
| 1 B | 14 B | 27 A | 40 D |
| 2 C | 15 C | 28 A | 41 B |
| 3 D | 16 B | 29 C | 42 B |
| 4 C | 17 A | 30 D | 43 B |
| 5 B | 18 D | 31 B | 44 A |
| 6 A | 19 C | 32 D | 45 C |
| 7 B | 20 C | 33 C | 46 D |
| 8 D | 21 A | 34 A | 47 B |
| 9 B | 22 C | 35 B | 48 C |
| 10 C | 23 D | 36 B | 49 B |
| 11 C | 24 B | 37 C | 50 A |
| 12 A | 25 B | 38 C | |
| 13 C | 26 A | 39 C | |

Paper 2

Section A

- 1 a Thirty-seven b One thousand four hundred and twenty-nine
- 2 a $4\,326 = 4\,000 + 300 + 20 + 6$
b $4,39 = 4 + 0,3 + 0,09$
c $9\,642 = 9\,000 + 600 + 40 + 2$
d $15,24 = 10 + 5 + 0,2 + 0,04$
- 3 9 998
- 4 a $496 > 299$ b $3,46 > 0,99$
- 5 a 90 b 260 c 500
- 6 a $\frac{1}{3}$ b $\frac{5}{13}$
- 7 80%
- 8 a 915 b 128
- 9 $\frac{4}{5}$
- 10 \$80.00

Section B

- 11 a \$50.00
b \$1 200.00
c \$30.09
- 12 a $2\frac{1}{2}$
b 12,5 kg
- 13 a 200 plants
b 1 000 fruits
- 14 a 59 coins
b 8 935
c Missing sign is +.
- 15 a 0,54
b 0,96
c 4

Topic 3

Measures

Unit 17: Money

Unit objectives

By the end of this unit, learners should be able to:

- a** express money in dollars and cents and vice versa.
- b** break down money into smaller denominations.
- c** calculate change within the range.
- d** describe heritage features on Zimbabwean coins and notes.
- e** perform operations involving money.

Teaching and learning materials

- PlusOne Grade 4 Mathematics Learner's Book pages 169–176.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Exercise 17.1

- 1** **a** 500 cents **b** \$2.20 **c** 850 cents **d** \$9.75
- 2** **a** \$5 + \$3 + \$2 (any correct three-part breakdown accepted)
b \$1 + 50c + 25c
c 50c + 10c + 5c
- 3** **a** \$2.50 **b** 55c **c** \$2.00
- 4** **a** \$19.75 **b** \$5.25 **c** \$1.00
d \$2.00 **e** \$18.00

Exercise 17.2

- 1** $\$1.25 = \$1 + \$0.20 + \0.05
- 2** $\$6.98 = \$6 + \$0.90 + \0.08
- 3** $\$9.29 = \$9 + \$0.20 + \0.09
- 4** $\$12.36 = \$10 + \$2 + \$0.30 + \$0.06$
- 5** $\$32.76 = \$30 + \$2 + \$0.70 + \$0.06$
- 6** $\$30.28 = \$30 + \$0.20 + \0.08

7 $\$45.04 = \$40 + \$5 + \0.04

9 $\$867.20 = \$800 + \$60 + \$7 + \$0.20$

8 $\$214.85 = \$200 + \$10 + \$4 + \$0.80 + \0.05

10 $\$254.60 = \$200 + \$50 + \$4 + \$0.60$

Activity 17.2

Learners correctly convert dollars to cents and cents to dollars following examples.

Answers may vary, but conversions must be accurate.

Exercise 17.3

1 $\$23.00 = 2\,300$ cents

4 $\$212.00 = 21\,200$ cents

2 $\$26.00 = 2\,600$ cents

5 $\$500.00 = 50\,000$ cents

3 $\$89.00 = 8\,900$ cents

Convert to dollars

6 234 cents = $\$2.34$

9 900 cents = $\$9.00$

7 528 cents = $\$5.28$

10 805 cents = $\$8.05$

8 872 cents = $\$8.72$

Exercise 17.4

Number	Money given	Price of goods	Change given
1	\$5.00	\$2.00	\$3.00
2	\$10.00	\$7.00	\$3.00
3	\$15.00	\$10.00	\$5.00
4	\$20.00	\$15.30	\$4.70
5	\$50.00	\$37.90	\$12.10
6	\$100.00	\$89.00	\$11.00
7	\$500.00	\$320.00	\$180.00
8	\$600.00	\$421.00	\$179.00
9	\$1 500.00	\$1 325.00	\$175.00
10	\$2 200.00	\$2 104.00	\$96.00

Unit revision exercises

Multiple choice answers

1 B

6 C

2 D

7 C

3 B

8 B

4 A

9 B

5 B

10 D

Structured questions answers

- 11 $\$213.08 = 21\,308$ cents
- 12 $67\,243$ cents = $\$672.43$
- 13 $\$20.00 - \$15.00 = \$5.00$
- 14 $\$9.80$

Unit 18: Time

Unit objectives

By the end of this unit, learners should be able to:

- a identify units of time.
- b use am, pm, weekly and fortnight to tell time.
- c tell time to the nearest 5 minutes.
- d convert time from one unit to another. (minutes to hours, days to weeks, days to fortnights, weeks to months)

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 177–190.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 18.1

- a January – 31
February – 28 (ordinary year)
March – 31
April – 30
May – 31
June – 30
July – 31
August – 31
September – 30
October – 31
November – 30
December – 31

- b** Most months have 4 weeks and some extra days (30 or 31 days $\approx$ 4 weeks). February has 4 weeks.
- c** Learners correctly identify the day of the week for given dates using the calendar.
- d** 365 days
- e** Learners correctly identify the day of the week for each public holiday using the calendar provided.

Exercise 18.1

- | | |
|----------------------|---------------------|
| 1 January | 6 Saturday |
| 2 30 days | 7 91 |
| 3 Wednesday | 8 Tuesday |
| 4 Four months | 9 Monday |
| 5 Thursday | 10 12 months |

Activity 18.2

Learners practise using a.m and p.m to show when different occasions happened.

Exercise 18.2

- | | |
|---------------------|----------------------|
| 1 9.00 a.m. | 6 2.00 p.m. |
| 2 11.00 a.m. | 7 9.00 p.m. |
| 3 10.00 a.m. | 8 4.00 p.m. |
| 4 5.00 a.m. | 9 12.00 p.m. |
| 5 2.00 a.m. | 10 12.00 a.m. |

Exercise 18.3

- 1** 5 minutes past 8
- 2** 20 minutes past 11
- 3** 25 minutes past 1
- 4** 25 minutes past 1
- 5** 20 minutes past 7
- 6** Clock drawings
 - a** 25 minutes past 10
 - b** 5 minutes past 12
 - c** 20 minutes past 5
 - d** 25 minutes past 11
 - e** Half past any given hour (30 minutes past)

Activity 18.3

- 1 Table

Minutes	60	120	180	300
Hours	1	2	3	5

- 2 a 240 min = 4 hours b 360 min = 6 hours c 420 min = 7 hours
- 3 Learners compare each other's answers.

Exercise 18.4

- 1 a 120 min = 2 hours
b 240 min = 4 hours
c 360 min = 6 hours
d 480 min = 8 hours
- 2 a 2 hours = 120 minutes
b 6 hours = 360 minutes
c 4 hours = 240 minutes
d 8 hours = 480 minutes
- 3 4 hours
- 4 180 minutes
- 5 3 hours 30 minutes

Activity 18.4

Weeks	1	10	3	8
Days	7	70	21	56

Exercise 18.5

- 1 a 7 days = 1 week
b 35 days = 5 weeks
c 56 days = 8 weeks
d 84 days = 12 weeks
- 2 a 3 weeks = 21 days
b 5 weeks = 35 days
c 8 weeks = 56 days
d 10 weeks = 70 days

- 3 9 weeks
- 4 84 days
- 5 6 weeks

Activity 18.5

Days	14	28	42	70
Fortnights	1	2	3	5

Exercise 18.6

- 1
 - a 14 days = 1 fortnight
 - b 28 days = 2 fortnights
 - c 42 days = 3 fortnights
 - d 84 days = 6 fortnights
- 2
 - a 4 fortnights = 56 days
 - b 6 fortnights = 84 days
 - c 10 fortnights = 140 days
 - d $2\frac{1}{2}$ fortnights = 35 days
- 3 7 fortnights
- 4 70 days
- 5 168 days

Activity 18.6

Weeks	4	8	12	16
Months	1	2	3	4

Exercise 18.7

- 1
 - a 8 weeks = 2 months
 - b 12 weeks = 3 months
 - c 24 weeks = 6 months
 - d 36 weeks = 9 months
- 2
 - a 2 months = 8 weeks
 - b 15 months = 60 weeks
 - c 5 months = 20 weeks
 - d 8 months = 32 weeks
- 3 8 months
- 4 24 weeks
- 5 12 months

Unit revision exercises

Multiple choice answers

- | | |
|-----|-----|
| 1 D | 6 C |
| 2 B | 7 D |
| 3 C | 8 B |
| 4 C | 9 D |
| 5 B | |

Structured questions answers

- 10 January
- 11 28 days
- 12 70 days
- 13 20 years
- 14 Learners draw a correct clock face showing 25 minutes past 6.
- 15 20 minutes past 7.

Unit 19: Mass

Unit objectives

By the end of this unit, learners should be able to:

- a find the mass of different objects.
- b convert kilogrammes to grammes.
- c perform operations involving mass.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 191–197.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 19.1

- 1 Mass of pieces of chalk – for example, 120 g.
- 2 Mass of pens – for example, 80 g.
- 3 Mass of a duster – for example, 150 g.

Learners must use a weighing scale and record correct units in grammes (g).

Exercise 19.1

- 1
 - School bag – for example, 3 kg.
 - Water tumbler – for example, 250 g.
 - Tennis ball – for example, 60 g.
- 2
 - a 1 kg of soil
 - b 2 kg of soil
 - c 300 g of sand
 - d 500 g of sand
- 3
 - a 2 kg
 - b 1 kg
 - c 5 kg
 - d 3 kg
- 4
 - a Nhlahla
 - b Khaya
 - c Khaya
 - d 50 kg
 - e 25 kg
 - f 45 kg
 - g Khaya
 - h Khaya
 - i Trevor, Titus, Phika, Ntapa, Miha, Themba, Nhlahla
 - j 25 kg

Activity 19.2

- 1 1 kilogramme = 1 000 grammes
- 2 2×500 grammes = 1 kg
- 3 1 000 grammes = 1 kilogramme
- 4
 - a 4, 5 kg
 - b 7,740 kg
 - c 14,450 kg

Exercise 19.2

- 1
 - a 5 kg = 5 000 g
 - b 9 kg = 9 000 g
 - c 25 kg = 25 000 g
 - d 18 kg 500 g = 18 500 g
 - e 36 kg 200 g = 36 200 g

- 2 a 8 000 g = 8 kg
 b 14 000 g = 14 kg
 c 24 000 g = 24 kg
 d 68 000 g = 68 kg
 e 92 000 g = 92 kg
- 3 25 000 g
- 4 1 kg

Exercise 19.3

- 1 106 kg
 2 32 packets
 3 12,3 kg
 4 6,265 kg
 5 17,7 kg
- 6 14 kg
 7 Paul is lighter than Peter by 15 kg.
 8 150 kg
 9 25 kg each

Unit revision exercises

Multiple choice answers

- 1 A
 2 B
 3 D
 4 D
 5 A
- 6 B
 7 D
 8 C
 9 C
 10 A

Structured questions answers

- 11 a 65 000 b 37 000 g
 12 a 1 300 g b 7 340 g
 13 150 kg
 14 25 kg

Unit 20: Length

Unit objectives

By the end of this unit, learners should be able to:

- a approximate length using spans and paces.
 b measure length to the nearest centimetres and metres.
 c convert units of length within the range.
 d perform operations involving length.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 198–205.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 20.1

Answers depend on the actual objects measured. Accept reasonable measurements.

Examples (teacher-guided):

- Window: 8 paces = 8 m
- Table: 4 spans = 60 cm
- Classroom length: 12 paces = 12 m
- Chair height: 3 spans = 45 cm

Learners must correctly measure, record and convert using:

- 1 span = 15 cm
- 1 pace = 1 m

Exercise 20.1

(1 span = 15 cm)

- | | |
|---------------------|---------------------|
| 1 5 spans = 75 cm | 4 15 spans = 225 cm |
| 2 7 spans = 105 cm | 5 20 spans = 300 cm |
| 3 10 spans = 150 cm | |

(1 pace = 1 m)

- | | | |
|-------------------|---------------------|----------------------|
| 6 4 paces = 4 m | 8 98 paces = 98 m | 10 756 paces = 756 m |
| 7 10 paces = 10 m | 9 167 paces = 167 m | |

Activity 20.2

Accept accurate ruler measurements to the nearest metre.

Exercise 20.2

Lines should be drawn accurately as:

- | | |
|---------|----------|
| 1 4 mm | 6 5 cm |
| 2 6 mm | 7 6 cm |
| 3 8 mm | 8 10 cm |
| 4 20 mm | 9 14 cm |
| 5 23 mm | 10 16 cm |

Exercise 20.3

- 1
 - a 1 cm
 - b 3,5 cm
 - c 8 cm
 - d 9,5 cm
- 2
 - a 20 mm
 - b 60 mm
 - c 85 mm
 - d 120 mm
- 3
 - a 4 cm 5 mm
 - b 6 cm 7 mm
 - c 12 cm 3 mm
 - d 29 cm 8 mm
- 4 8 cm 5 mm
- 5 30 mm
- 6 7,5 cm
- 7 96 mm
- 8 4,5 cm

Exercise 20.4

- 1
 - a 400 cm
 - b 900 cm
 - c 1 215 cm
 - d 2 730 cm
- 2
 - a 0.1 m
 - b 0.25 m
 - c 2 m
 - d 3,5 m
- 3
 - a 2 m 15 cm
 - b 12 m 30 cm
 - c 24 m 25 cm
 - d 87 m 20 cm
- 4 210 cm
- 5 2 000 cm
- 6 8 m 30 cm
- 7 1 825 cm
- 8 0,3 m

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 A | 6 A |
| 2 B | 7 C |
| 3 D | 8 C |
| 4 D | 9 B |
| 5 C | 10 A |

Structured questions answers

- | | |
|-------------|-----------|
| 11 a 200 mm | b 350 mm |
| 12 a 35 cm | b 73,4 cm |
| 13 6 800 cm | |
| 14 3,48 m | |

Unit 21: Shapes

Unit objectives

By the end of this unit, learners should be able to:

- a name different plane shapes.
- b name different solid shapes.
- c identify various shapes in patterns.
- d state the properties of plane shapes and solid shapes.
- e draw and construct a cube, rectangular prism and frames (triangular and rectangular).

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 206–213.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 21.1

Learners should:

- Draw and label plane shapes such as rectangle, square, triangle, circle and rhombus.
- Collect objects shaped like rectangular prisms, cylinders, cubes and triangular prisms.
- Correctly name each shape.
- Model solid shapes using bricks and cardboard boxes.

Accept any correct drawings, models and explanations.

Exercise 21.1

Learners draw and name the following shapes in their exercise books.

- | | |
|-------------|---------------------|
| 1 Rectangle | 6 Cube |
| 2 Square | 7 Rectangular prism |
| 3 Circle | 8 Can (cylinder) |
| 4 Triangle | 9 Rectangle |
| 5 Square | 10 Rhombus |

Exercise 21.2

- 1 Cube
- 2 6 faces
- 3 8 corners
- 4 Triangular prism
- 5 A rectangle and a triangle.
- 6 9 edges
- 7 6 corners
- 8 Cylinder
- 9 3 faces
- 10 Circle

Activity 21.2

Learners draw and label parts of a circle, such as:

- Centre
- Radius
- Diameter
- Circumference
- Chord

Accept any correctly labelled diagram.

Exercise 21.3

- | | |
|-----------------|--|
| 1 Diameter | 7 Side |
| 2 Radius | 8 Opposite sides are equal and parallel. |
| 3 Chord | 9 4 right angles |
| 4 Diameter | 10 Quadrilateral |
| 5 Circumference | |
| 6 Square | |

Activity 21.3

Learners should:

- Model solid shapes such as a cube, rectangular prism, cylinder and sphere.
- They write the properties of the shapes, for example:
 - **Cube: 6 equal faces**
 - **Cylinder: curved surface and 2 circular faces**

Exercise 21.4

- | | |
|---------------------|--------------|
| 1 Rectangular prism | 6 Square |
| 2 Cylinder | 7 Circle |
| 3 Cube | 8 Square |
| 4 Rhombus | 9 Triangle |
| 5 Rectangle | 10 Rectangle |

Unit revision exercises

Multiple choice answers

- | | |
|-----|-----|
| 1 A | 6 B |
| 2 C | 7 C |
| 3 C | 8 D |
| 4 C | 9 A |
| 5 D | |

Structured questions answers

- 10 Triangle, rectangle, square, circle.
- 11 A solid shape has length, width and height.
- 12 6 faces
- 13 4 sides
- 14 Opposite sides are equal and parallel.
- 15 Learners draw a circle with the correct radius shown.
- 16 Correct drawing of a sphere.
- 17 Correct drawing of a cylinder.

Unit 22: Perimeter

Unit objective

By the end of this unit, learners should be able to:

- a** find the perimeter of various plane shapes.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 214–219.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 22.1

Learners measure Mathematics exercise books with a string. They record the distance between the two marked points.

Activity 22.2

$$\text{Perimeter} = 4 \times 25 \text{ cm} = 100 \text{ cm}$$

Activity 22.3

$$\text{Perimeter} (8 \text{ cm} + 9 \text{ cm} + 10 \text{ cm}) = 27 \text{ cm}$$

Exercise 22.1

- 276 cm
 - 200 m
 - 168 cm
 - 113 cm
- 32 cm
 - 80 m
 - 54 cm
- 28 cm
 - 48 cm
 - 88 m
- 27 cm
 - 60 cm
 - 44 cm

- 5 79 cm
- 6 20 m
- 7 20 m
- 8 27 m

Unit revision exercises

Multiple choice answers

- | | |
|-----|-----|
| 1 C | 5 C |
| 2 B | 6 C |
| 3 D | 7 C |
| 4 C | 8 D |

Structured questions answers

- | | |
|---------|----------|
| 9 36 m | 13 80 cm |
| 10 60 m | 14 21 cm |
| 11 34 m | 15 60 m |
| 12 52 m | 16 14 m |

Unit 23: Rate

Unit objective

By the end of this unit, learners should be able to:

- a relate two measures.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 220–227.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 23.1

Learners produce their own timetables with the facilitator's help. Discussion should show how often each subject appears (frequency/rate). Answers will vary depending on learner timetables.

Exercise 23.1

- | | |
|---------|----------------|
| 1 Once | 3 PE and Arts. |
| 2 Twice | 4 IsiNdebele |

- 5 Maths
- 6 Five times.
- 7 Five subjects.

- 8 Maths
- 9 English
- 10 Four times.

Activity 23.2

Learners count vehicles and record frequencies. Percentages depend on actual counts. Answers will vary by school.

Exercise 23.2

- 1 Cars
- 2 Motorbikes and tractors.
- 3 25%
- 4 15%
- 5 10%
- 6 35%
- 7
 - a 250 buses
 - b 400 cars
 - c 50 tractors
 - d 100 pedestrians

Exercise 23.3

- 1 Six crops.
- 2 Beans and sorghum.
- 3 Wheat
- 4 2 000 tonnes.
- 5 Sunflower
- 6 1 500 tonnes.
- 7 2 000 tonnes.
- 8 5 000 tonnes.
- 9 9 500 tonnes.
- 10 1 500 tonnes.

Exercise 23.4

- 1 \$300
- 2 \$45
- 3 \$750
- 4 15 oranges
- 5 \$10
- 6 \$360
- 7 \$2 500
- 8 \$5 000

Unit revision exercises

Multiple choice answers

- 1 B
- 2 A
- 3 A
- 4 B
- 5 C
- 6 A

7 D

8 B

9 C

Structured questions answers

10 \$246.00

11 \$45

12 60 days

13 40 litres

14 48 wheels

Unit 24: Area

Unit objectives

By the end of this unit, learners should be able to:

- a find area of square.
- b calculate the area of a rectangle.
- c compute the area of a right-angled triangle.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 228–236.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 24.1

Learners draw different rectangles, showing $\text{length} \times \text{width}$ and calculate $\text{area} = \text{length} \times \text{width}$.
Answers will vary, depending on the rectangles drawn.

Exercise 24.1

1 12 cm^2

2 18 cm^2

3 20 cm^2

4 35 cm^2

5 45 cm^2

6 32 cm^2

7 60 cm^2

8 70 cm^2

9 54 cm^2

10 300 cm^2

Exercise 24.2

1 16 cm^2

2 36 cm^2

3 49 cm^2

4 100 cm^2

- 5 64 cm^2
- 6 81 cm^2
- 7 9 cm^2

- 8 144 cm^2
- 9 121 cm^2
- 10 400 cm^2

Exercise 24.3

- 1 10 cm^2
- 2 12 cm^2
- 3 20 cm^2
- 4 14 cm^2
- 5 $22,5 \text{ cm}^2$

- 6 35 m^2
- 7 24 m^2
- 8 $31,5 \text{ m}^2$
- 9 $17,5 \text{ m}^2$
- 10 70 m^2

Exercise 24.7

- 1 $3\,600 \text{ m}^2$
- 2 140 m^2
- 3 100 cm^2
- 4 35 cm^2
- 5 70 m^2

- 6 400 m^2
- 7 162 m^2
- 8 $1,8 \text{ m}^2$
- 9 63 m^2
- 10 600 cm^2

Unit revision exercises

Multiple choice answers

- 1 C
- 2 A
- 3 C
- 4 B
- 5 B

- 6 D
- 7 B
- 8 A
- 9 B
- 10 C

Structured questions answers

- 11
 - a 48 cm^2
 - b 25 cm^2
 - c 42 cm^2
- 12 70 cm^2
- 13 450 m^2

Unit 25: Volume and capacity

Unit objectives

By the end of this unit, learners should be able to:

- a convert millilitres to litres and vice versa.
- b measure the volume of liquids using half-litre and quarter-litre containers.
- c find capacity and volume of liquids in millilitres and litres.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 237–243.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 25.1

Learners pour water between containers and record how many times one container fills another. Answers will vary depending on the containers used. The facilitator checks the correct understanding of litre relationships.

Exercise 25.1

- | | |
|-----|-------------|
| 1 4 | 6 10 |
| 2 3 | 7 4 |
| 3 2 | 8 3 litres |
| 4 2 | 9 4 litres |
| 5 8 | 10 5 litres |

Exercise 25.2

- | | |
|-------------|-------------|
| 1 \$60 | 6 \$120 |
| 2 14 litres | 7 \$910 |
| 3 \$70 | 8 20 litres |
| 4 \$140 | 9 30 litres |
| 5 \$30 | 10 9 litres |

Activity 25.2

- 1 4 litres 500 ml
- 2 6 litres 745 ml
- 3 8 litres 950 ml

Exercise 25.4

- 1
 - a 6 litres
 - b 8 litres
 - c 25 litres
 - d 17,6 litres
 - e 50,75 litres
- 2
 - a 4 000 ml
 - b 14 000 ml
 - c 40 000 ml
 - d 54 000 ml
 - e 64 000 ml
- 3 20 litres
- 4
 - a 7 200 ml
 - b 7,2 litres

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 B | 6 D |
| 2 D | 7 D |
| 3 A | 8 A |
| 4 C | 9 A |
| 5 D | 10 B |

Structured questions answers

- | | |
|--------------------|------------------|
| 11 10 litres | 14 92 learners |
| 12 8 litres 546 ml | 15 23,056 litres |
| 13 375 passengers | 16 2 400 ml |

Unit 26: Directions, angles and lines

Unit objectives

By the end of this unit, learners should be able to:

- a illustrate diagrammatically the four cardinal points.
- b identify horizontal and vertical lines.
- c identify right angles.
- d illustrate a complete, quarter and half revolution.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 244–253.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 26.1

Learners identify places to the north, south, east and west of the school and draw simple maps. Answers will vary based on the school environment. The facilitator checks the correct use of directions and simple mapping skills.

Exercise 26.1

- 1 East
- 2 North
- 3 West
- 4 South
- 5 East
- 6 West
- 7 North
- 8 East
- 9 South
- 10 South

Activity 26.2

Learners identify horizontal lines on school structures. Answers depend on observations made.

Exercise 26.2

Horizontal lines are:

a, f, g, h, i and l.

Activity 26.3

Learners identify vertical lines around the school environment. Answers vary based on structures observed.

Exercise 26.3

Vertical lines are found in d, f, h, j, m, o, p and q.

Exercise 26.4

- 1 South
- 2 North
- 3 East
- 4 West
- 5 North

- 6 South
- 7 West
- 8 West
- 9 3 right angles
- 10 1 right angle

Unit revision exercises

Multiple choice answers

- | | | | |
|-----|-----|-----|------|
| 1 B | 4 C | 7 A | 10 B |
| 2 A | 5 C | 8 C | 11 A |
| 3 B | 6 C | 9 C | 12 A |

Structured questions answers

- 13 Horizontal line
- 14 Vertical line
- 15 Right angle
- 16 South
- 17 3 right angles
- 18 Quarter revolution arrow drawn ($\frac{1}{4}$ turn).
- 19 Half-revolution arrow drawn ($\frac{1}{2}$ turn).
- 20 Complete revolution sketch drawn (full turn).
- 21 Example: Door frame, window frame, classroom corner.
- 22 90° (right angle)

Unit 27: Data handling

Unit objectives

By the end of this unit, learners should be able to:

- a collect data.
- b interpret information from tables.
- c interpret information from bar graphs.
- d represent information from column graphs.
- e identify a pie-chart.
- f identify the different sections of a pie-chart.
- g divide a circle into sections to represent data.

Teaching and learning materials

- PlusOne Mathematics Grade 4 Learner's Book pages 254–274.
- Heritage Based Curriculum (HBC) Junior Mathematics syllabus 2024–2030.

Suggested answers

Activity 27.1

Learners practise reading distance tables and locating distances between places. Answers recorded in learners' notebooks using the given distance table. The facilitator checks the accuracy of distances and corrects place names.

Exercise 27.1

Number	From	To	Distance
1	Kadoma	Hwange	557 km
2	Gweru	Harare	275 km
3	Chimanimani	Gweru	461 km
4	Kadoma	Chimanimani	557 km
5	Harare	Kadoma	114 km
6	Kariba	Harare	365 km
7	Chinhoyi	Kariba	249 km
8	Hwange	Chinhoyi	769 km
9	Beitbridge	Harare	658 km
10	Bulawayo	Beitbridge	567 km

Exercise 27.2

Name	Mathematics	English	Science and Technology	PE and Arts
Mary	40%	65%	85%	90%
Peter	45%	60%	70%	80%
Sam	60%	60%	70%	85%
Jethro	70%	70%	60%	65%
Tom	75%	75%	75%	80%
Ben	70%	75%	80%	75%
Susan	65%	50%	60%	55%
Alice	90%	75%	65%	50%
Daniel	50%	65%	55%	65%
Vusa	50%	60%	55%	70%

Activity 27.2

Learners draw tables and graphs from collected data. Graphs may vary but must be accurate and labelled.

Exercise 27.3

- 1

Tom
- 2

Mary
- 3

30%
- 4

60%
- 5

4 learners
- 6

Daniel and Mary.
- 7

5 candidates
- 8

65%
- 9

285%
- 10

57%

Exercise 27.4

- 1

5%
- 2

50%
- 3

Minerals
- 4

Organic matter, water and air.
- 5

4 elements
- 6

8.00 a.m
- 7

15 minutes
- 8

Mekisi
- 9

Fili
- 10

1.00 p.m

Exercise 27.5

- 11

a

|||

b

|||| |||| |||

c

|||| |||

d

||||
- 12

Table completion

Animal	Number	Tally
Goats	11	
Cows	6	
Sheep	4	

Activity 27.3

- a

Circle
- b

Parts or quantities of a whole.
- c

More

Exercise 27.6

- 1 Learners draw a circle divided into 3 sections (4: 4: 2)
2 a Bananas b Grapes c 10 learners

Unit revision exercises

Multiple choice answers

- | | |
|-----|------|
| 1 D | 6 B |
| 2 B | 7 A |
| 3 D | 8 C |
| 4 D | 9 C |
| 5 B | 10 D |

Structured questions answers

- | | |
|------------------|---------------------------|
| 11 100 teachers. | 14 Science and Technology |
| 12 25 teachers. | 15 70 teachers. |
| 13 IsiNdebele | 16 7 learning areas. |

Test 3

Paper 1: Multiple choice answers

- | | | | |
|------|------|------|------|
| 1 C | 14 D | 27 C | 40 D |
| 2 D | 15 A | 28 B | 41 A |
| 3 B | 16 B | 29 C | 42 D |
| 4 A | 17 B | 30 A | 43 D |
| 5 B | 18 B | 31 D | 44 A |
| 6 C | 19 C | 32 A | 45 C |
| 7 C | 20 D | 33 B | 46 C |
| 8 B | 21 C | 34 B | 47 C |
| 9 B | 22 A | 35 A | 48 B |
| 10 A | 23 A | 36 C | 49 B |
| 11 C | 24 D | 37 D | 50 D |
| 12 D | 25 D | 38 C | |
| 13 C | 26 B | 39 D | |

Paper 2

Section A

- 1 Two hundred and thirty-seven.
- 2 a 472
b 682
- 3 a 12
b 776
- 4 a 60 tens
b 2 tenths (0.2)
- 5 a XX
b XXXVII
- 6 a $3\frac{4}{7}$
b $\frac{2}{8}$ or $\frac{1}{4}$
- 7 a 57
b 33
- 8 a 90
b \$70
- 9 40 cm^2
- 10 4 days

Section B

- 11 a \$30
b \$40
- 12 a 7:15
b 3 hours 30 minutes
c 120 minutes
- 13 a 200 trees b 3 000 litres
- 14 a 150 cm^3 b 1 cm
- 15 a $(5)\frac{3}{7}$ b 2 c 5