Executive Preview

CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE
Primary Mathematics

MULTI-COMPONENT SAMPLE

Second edition

AKSORN

Cambridge Assessment International Education
Endorsed for full syllabus coverage

Dear teacher,

Welcome to the new edition of our *Cambridge Primary Mathematics series*, supporting the Cambridge Primary Mathematics curriculum framework (0096) from 2020.

This executive preview gives you a first look at our new resources and shows you how the key components – learner's book, workbook and teacher's resource – work together to support you and your learners.

In developing the series, we carried out extensive research with teachers around the world to make sure we understood your needs and challenges and how to best support you and your learners.

Learners will be fully supported with worked examples and plenty of practice exercises to help them build their confidence with a range of math concepts like handling data, algebra and probability. The series also includes specific exercises to help learners develop the skills to think and work mathematically.

You'll find an active learning approach throughout the resources, along with opportunities for learners to develop 21st-century skills, such as communication and collaboration. Alongside this, each unit includes a *'Getting started'* feature, clear lesson objectives and activities that offer peer and self-assessment – all supporting assessment for learning.

We understand that each learner has different needs, and that supporting this in the classroom can be challenging. Our learner's books and workbooks provide differentiated activities, while the teacher's resource offers guidance on how to bring differentiation into your lessons effectively. For example, the learner's book includes projects developed by NRICH, which offer learners an opportunity to explore an activity and allow for different ways to complete them. We've also included guidance in the teacher's resource on how to support and assess learners' work.

Mathematical vocabulary can be challenging. To support learners we have included key topic terms for each unit, along with a glossary and further language support suggestions and worksheets in the teacher's resource.

I hope you enjoy discovering the new series and how it can support you.

Tom Carter
Commissioning Editor
Cambridge University Press

Working together for schools

Cambridge University Press & Cambridge Assessment International Education

We are part of the University of Cambridge. Our mission is to contribute to society by enabling teaching and learning at the highest international levels of excellence.

We are at the forefront of education for 5 to 19 year-olds around the world. We share your desire to make a transformative impact on learners worldwide and unlock their potential.

We believe that education is most powerful when curriculum, assessment, teaching and learning are aligned. We work together for excellence in these areas, supporting schools to help learners grow academically and thrive as the adults of tomorrow.

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Create better learning moments

The moment when your learners make new discoveries, develop new skills or overcome challenges is hugely rewarding. These moments are made possible when learners have the skills and confidence to explore further and teachers have the support and insights to help them make that leap.

We want to help you create more of these moments.

With Cambridge, you'll find a curriculum and resources that encourage learners to think critically, collaborate and be creative. A range of assessments give you powerful insights to help you plan your learners' next steps and support with effective teaching approaches, including a range of professional development resources.

Find out more at **cambridge.org/education/primary_lower_secondary**

New curriculum, new resources, new approach

The latest editions of our primary and lower secondary series have been fully updated to support the new curriculum frameworks for English, English as a second language, maths and science. As well as updating the content, we wanted to take the opportunity to develop and improve the resources.

We spoke to hundreds of teachers around the world, carried out lesson observations and undertook research with the Cambridge Panel to help us understand your needs and challenges.

These conversations helped shape our **new series**:

A clear and consistent approach and activities to support **differentiation** help you ensure that every child can learn and progress.

More guidance and features to support **assessment for learning**, so you know your learners' strengths and weaknesses and can tailor teaching and learning activities around them.

Increased support in our teachers' resources and professional development courses helps you bring the most **effective teaching approaches** into your classroom.

Effective language support means learners can express themselves confidently.

From our downloadable digital editions for remote learning, to the interactive tasks, video and audio featured in **Digital** Classroom, we support a range of teaching needs.

Finally, the new series have been developed with a **consistent approach**, so whether you pick up an English, maths or science resource, you'll find the same features, teaching approaches and layout.

Think like a mathematician

You need to go from the centre to one of the outside hexagons in two steps:

1. Start in the centre.
2. Move to a multiple of 2.
3. Then move to a multiple of 5.

What are the possible paths you could take?
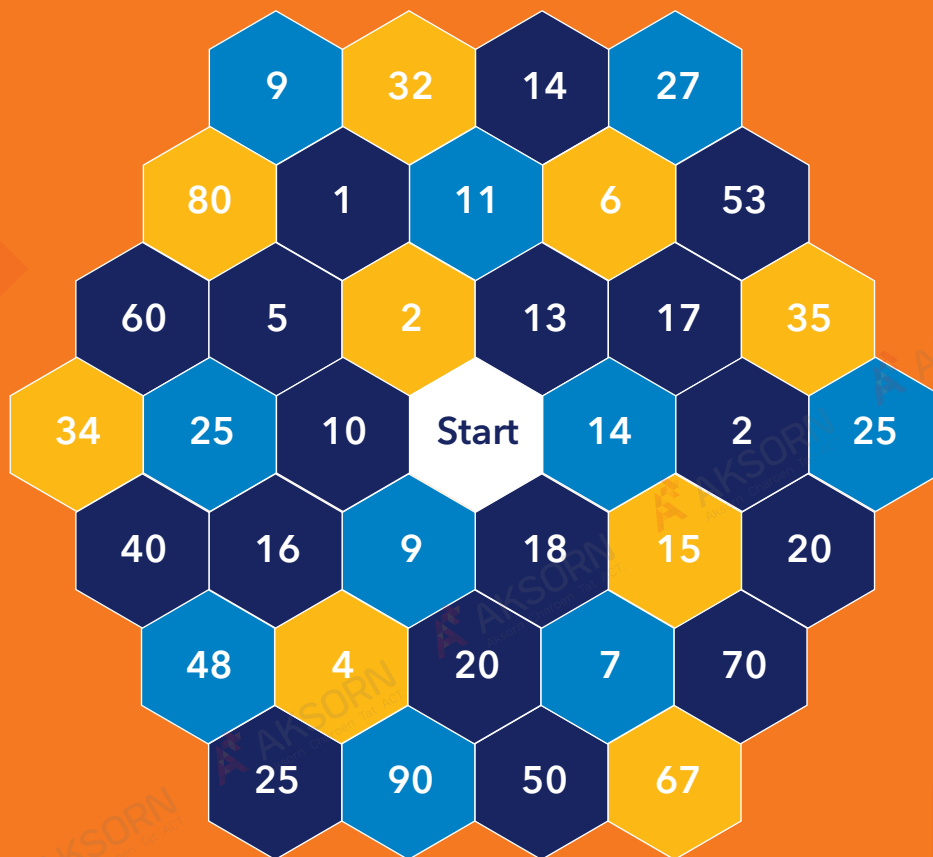
How to use this series
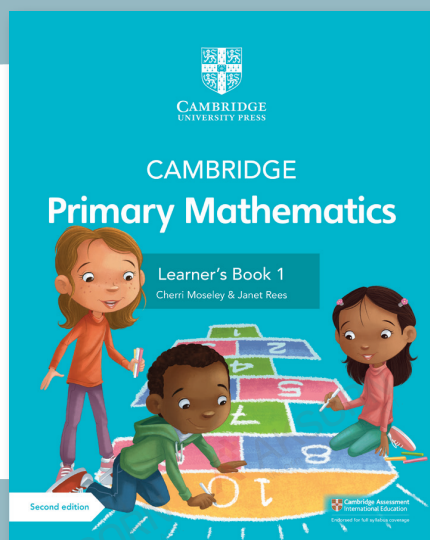
The Learner's Book is designed for students to use in class with guidance from the teacher. It contains sixteen units which offer complete coverage of the curriculum framework. A variety of investigations, activities, questions and images motivate students and help them to develop the necessary mathematical skills. Each unit contains opportunities for formative assessment, differentiation and reflection so you can support your learners' needs and help them progress.
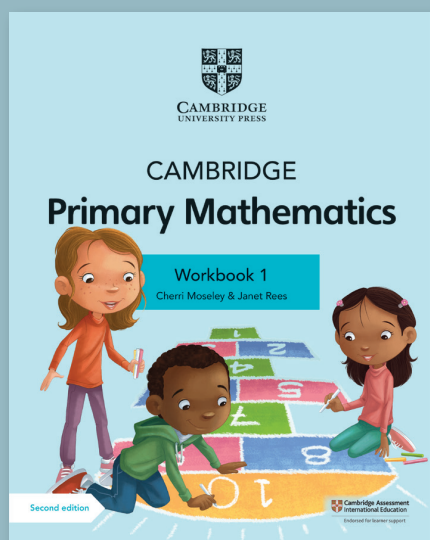
The skills-focused write-in Workbook provides further practice of all the topics in the Learner's Book and is ideal for use in class or as homework. A three-tier, scaffolded approach to skills development promotes visible progress and enables independent learning, ensuring that every learner is supported.

The Teacher's Resource is the foundation of this series and you'll find everything you need to deliver the course in here, including suggestions for differentiation, formative assessment and language support, teaching ideas, answers, tests and extra worksheets. Each Teacher's Resource includes:

- A print book with detailed teaching notes for each topic
- a Digital Teacher's Resource with all the material from the book in digital form plus editable planning documents, extra guidance, downloadable worksheets and more.
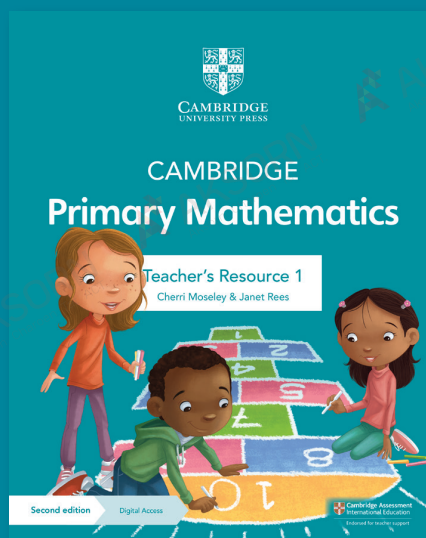
Digital Classroom includes digital versions of the Learner's Book and Workbook, complete with pop-up answers, designed for teachers to use at the front of class. Easily share the books with the whole class on your whiteboard, zoom in, highlight and annotate text, and get your learners talking with videos, images and interactive activities.
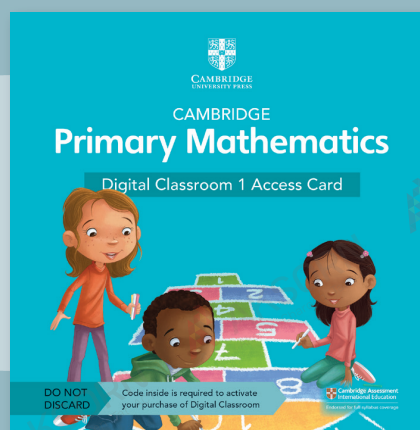
A letter to parents, explaining the course, is available to download from Cambridge GO (as part of this Teacher's Resource).

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CAMBRIDGE Primary Mathematics

Learner's Book 1

Cherri Moseley & Janet Rees

Second edition

Cambridge Assessment International Education

Endorsed for full syllabus coverage

Contents

How to use this book

In this book you will find lots of different features to help your learning:

Questions to find out what you know already. →

Getting started

1 This cookie is a whole.

How many parts is the cookie cut into?

Are they the same as each other? _____

What you will learn in the unit. →

We are going to . . .

- **count sets of objects.**

Important words that you will use. →

count   estimate   how many   line   set   total

Worked example 1

Which domino has 4 spots?

Answer:

This one!

Step-by-step examples showing a way to solve a problem. →
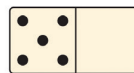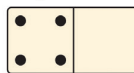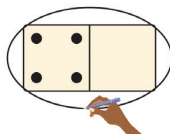
Questions to help you think about how you learn. →

What have you learned about sets and sorting?
Write or draw one thing that you know now that you didn't know before.

There are often many different ways to solve a problem.

These questions will help you develop your skills of thinking and working mathematically.

6 Write the number that comes **after**.

2 | 5 | 8 |

An investigation to carry out with a partner or in groups. This will help develop your skills of thinking and working mathematically.
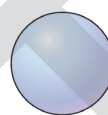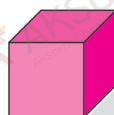
Let's investigate

Work with a partner to build a tower.
You can use more than one of each shape.
Talk about your tower and the shapes you will use.
Use the words **edge** and **face**.

Which shape would be good to start with?
Which shape would be better at the top of the tower?

What you have learned in the unit. Tick the column to show how you feel about each thing.
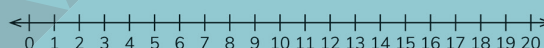
Look what I can do!

- I can compare two sets of numbers.
- I can say which set has more or fewer (or less or greater).
- I can recognise when two sets have the same number of objects.

Questions that cover what you have learned in the unit.

Check your progress

1 Add 6 and 9.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

2 Subtract 7 from 12.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
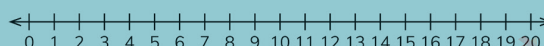
At the end of some units there is a project for you to carry out, using what you have learned. You might make something or solve a problem.

Arranging chairs

Mr Peters is setting up the school hall for some children to watch a film. He is arranging chairs into rows with the same number of chairs in each row.

He arranges the chairs into five rows and discovers that he has four chairs left over.

He collects the chairs back in and tries again. He arranges the chairs into three rows, but this time he has two chairs left over.

Finally he tries rearranging the chairs into just two rows, but he ends up with one chair left over.

How many chairs might Mr Peters have had altogether? How do you know?

7

1 ▸ Numbers to 10

Getting started

1 How many hippos are there?

Draw a (ring) around the number that matches the set.
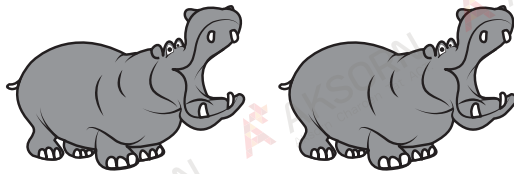
1	2	3

2 Count the toys and write the numbers.
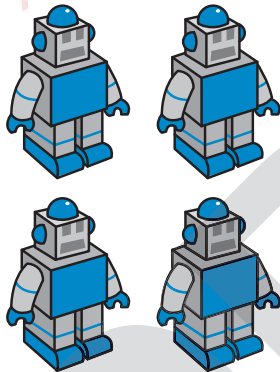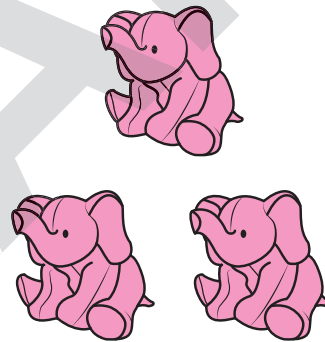
3 Write some numbers you know in the space below.

Tell your partner something about each of the numbers you wrote.

Numbers are all around us.

Sometimes a number is a label, like the number on a football shirt or the number on a bus.

We count to find out how many there are.

A pack of 2 T-shirts shows 2 on the pack.
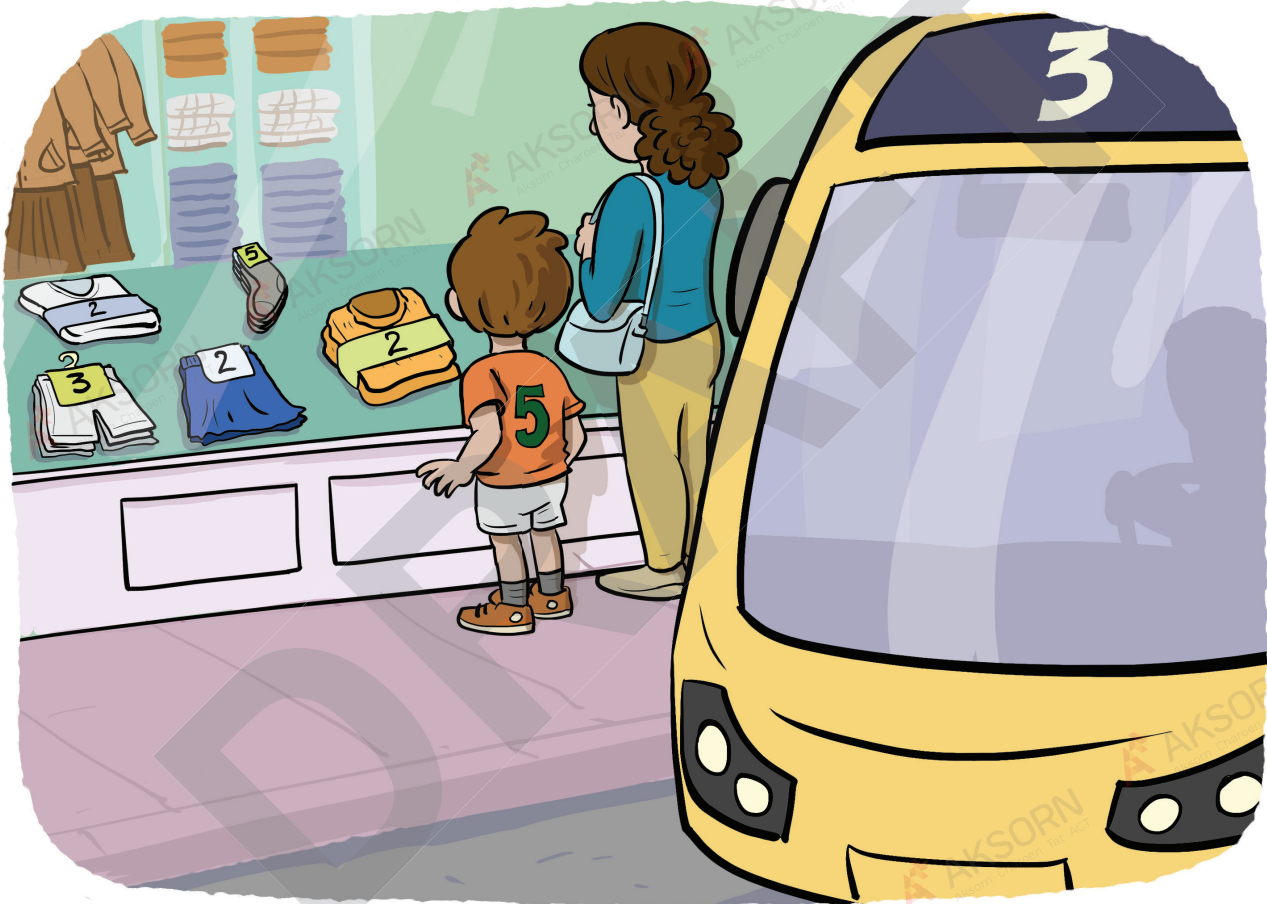
> 1.1 Counting sets of objects

We are going to ...

- **count sets of objects.**

You need to say the numbers in the correct order to count.

To count objects, start with 1 and say a number for each object.

The last number you say tells you how many objects there are.

How many?

1, 2, . . .

1, 2, 3, . . .

4
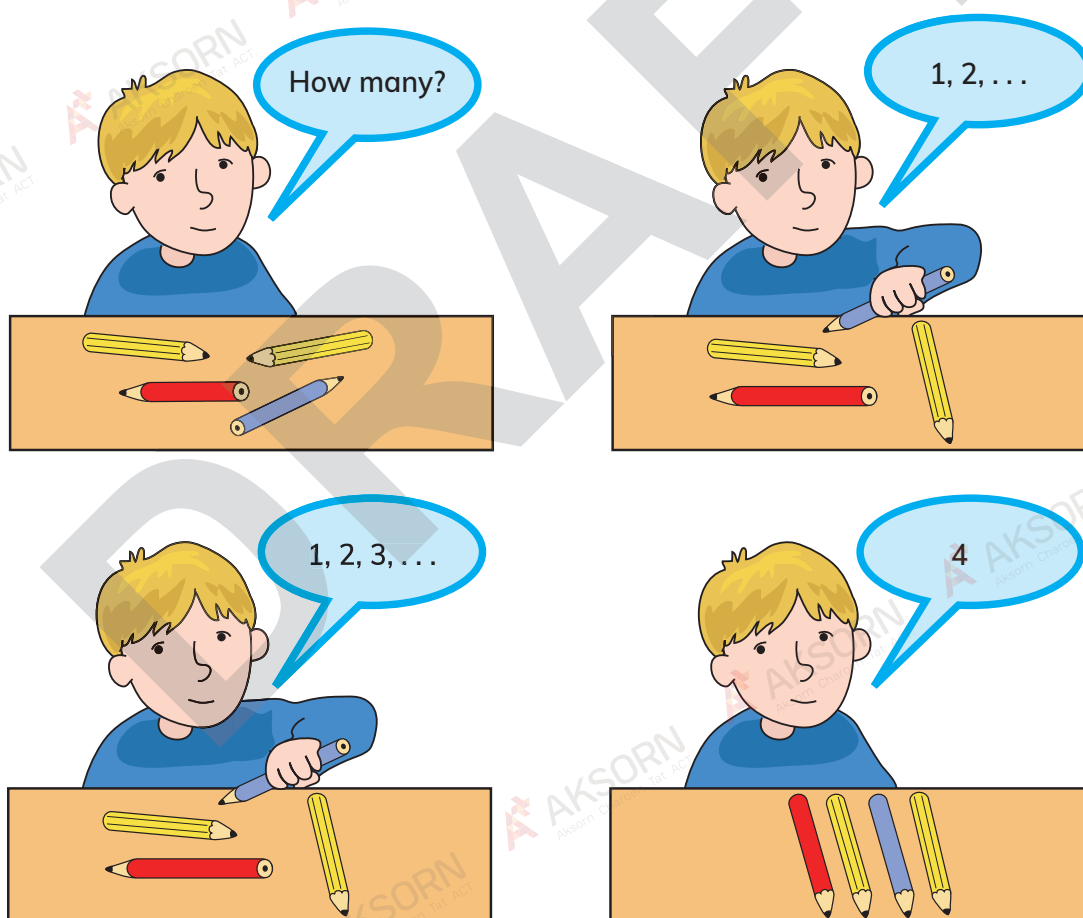
count   estimate   how many   line   set   total

Exercise 1.1

1   Count together.

1

2

3

4

5

6

7

8

9

10
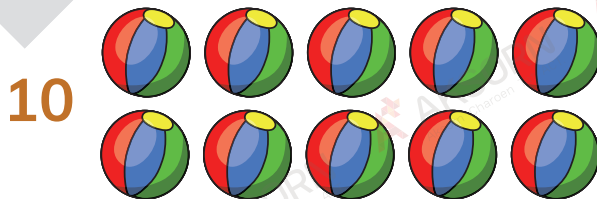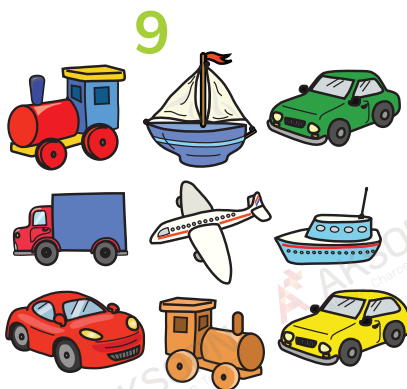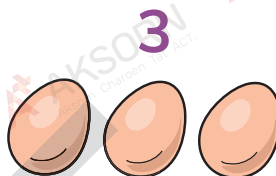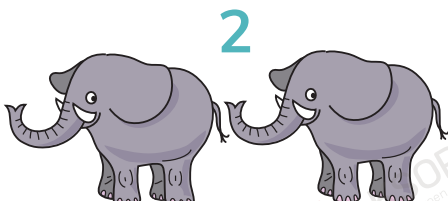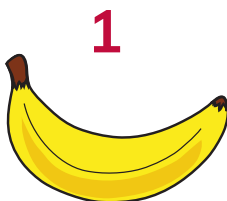
1	2	3	4	5	6	7	8	9	10

2 Put some objects in the box.

Count your set of objects.
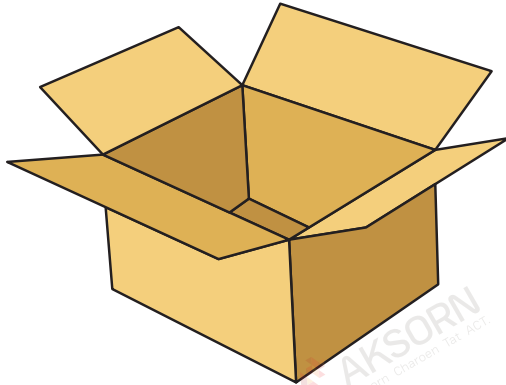
I counted to the same number each time!

Put your objects in a row. Count again.

3 Draw 3 counters 🟢 on the ten frame below.

3

Draw 6 buttons 🟣 in the ten frame below.

6

Draw 0 counters 🟠 in the ten frame below.

0

14 ⟩

Worked example 1

Which domino has 4 spots?
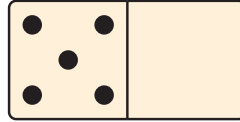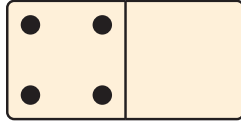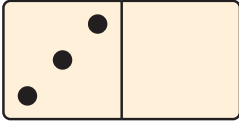
Answer:
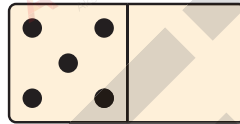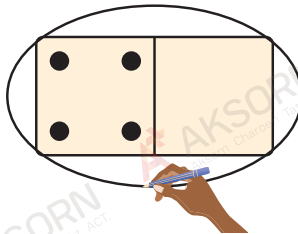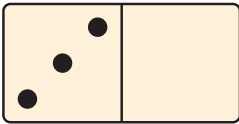
This one!

4   Which domino has 5 spots?

Draw a ring around the correct domino.
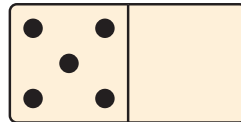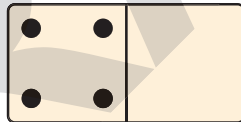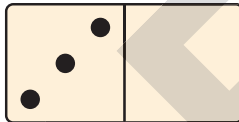
5   Which domino has 9 spots?

Draw a ring around the correct domino.
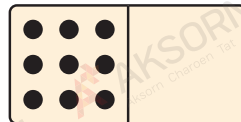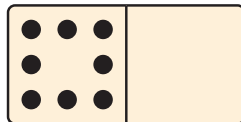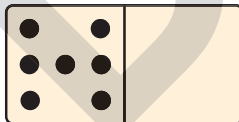
6   Match each picture to the correct number.
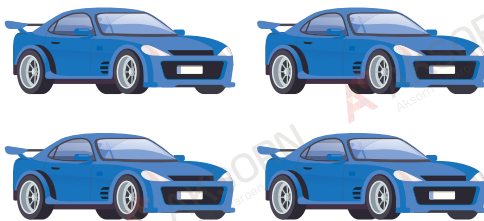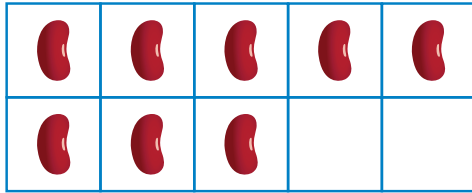
| 8 |
| 0 |
| 4 |
| 9 |
| 7 |
| 5 |

Ask your partner to show you how they got their answer.

7   Draw 7 bananas.

Make it easy to see how many there are.

Look at your answer to question 7.
How did you make it easy to see how many you drew?

Worked example 2

How many sunflowers are there? Estimate then count.

Answer:

	Estimate	Count
🌻	3	4

I am going to count the sunflowers to see if your estimate was close. 1, 2, 3, 4. There are 4. I estimated 3, so I was very close.

An estimate is a good guess. I estimate there are 3 sunflowers.

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8 Look at the picture on the previous page.

Estimate then count. Write the numbers.

Estimate	Estimate	Estimate	Estimate	Estimate
Count	Count	Count	Count	Count

Let's investigate

Work with a partner.

Make a poster all about a number.

Talk about your poster with your class.
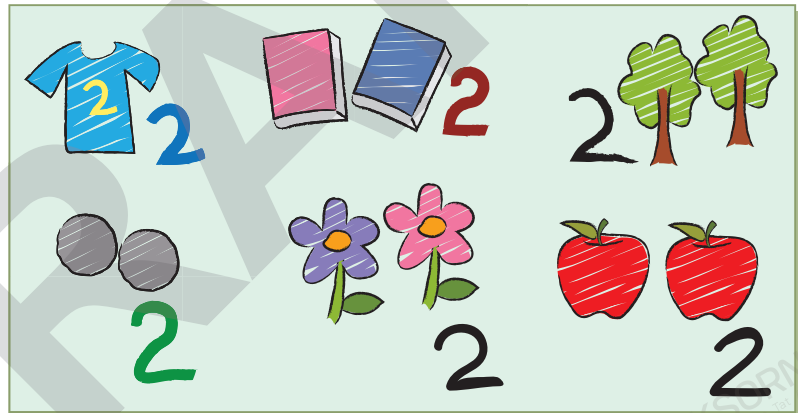
Look what I can do!

	😐	😊
• I can count objects and write the matching number.	○	○
• I can find or draw the correct number of objects.	○	○
• I can say how many objects are in some sets without counting.	○	○
• I can give a good estimate of how many objects there are.	○	○

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〉 1.2 Say, read and write numbers to 10

| **We are going to ...** |
| • **say, read and write numbers and number words to 10.** |

Saying the numbers in a number rhyme is a good way to learn the order of the numbers.

| after   before   between |
| next   numbers   order |
| point   track |

Exercise 1.2

1 Say this number rhyme together.

> 1, 2, 3, 4, 5,
>
> Once I caught a fish alive!
>
> 6, 7, 8, 9, 10,
>
> Then I let it go again!
>
> Why did you let it go?
>
> Because it bit my finger so.
>
> Which finger did it bite?
>
> This little finger on the right.
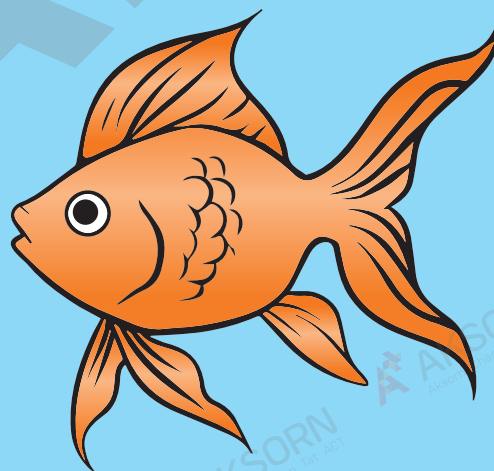
2 Say your favourite number rhyme to a partner.

3 Count to 10. Point to each number as you say it.

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

Worked example 3

Which number is missing?

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

1, 2, 3, 4, 5, Once I caught a fish alive! 6, 7, . . . I said 6 then 7, so 7 is the missing number.

Answer:

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

4   Count to 10. Which numbers are missing?

| 1 | 2 | | 4 | 5 | 6 | 7 | | 9 | 10 |

| 1 | | | 4 | 5 | 6 | 7 | | 9 | 10 |

5   Which numbers have been swapped in this number track?

Write the numbers in the box.

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

6 Write the number that comes **after**.

2	

5	

8	

7 Write the number that comes **before**.

	2

	5

	8

What do you do if you cannot remember a missing number?
Ask your partner to tell you what they do.

Look what I can do!

	😐	😊
• I can count to 10 and find a missing number.	○	○
• I can say some number rhymes.	○	○
• I can read and write the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.	○	○

› 1.3 Comparing numbers

We are going to …

- compare sets of objects and numbers.

You can compare different sets. You can find out which set **has** more, fewer or the same number of objects as another set.

Fewer means the same as **less**.
More means the same as **greater**.

compare   equal
fewer   more   same

Exercise 1.3

Worked example 4

Compare the two sets. Look for what is the same or different.
Tick ✓ the set that has **more objects**.
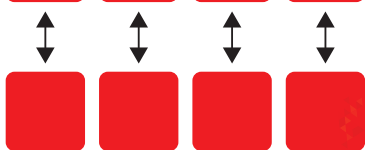
I can match each shape in one row with a shape in the other row.

There is no match for the last shape in the top row, so there are more shapes in the top row than in the bottom row. I need to tick the top row.

Answer:

1   Compare the sets.

Tick ✓ the set that has fewer objects.
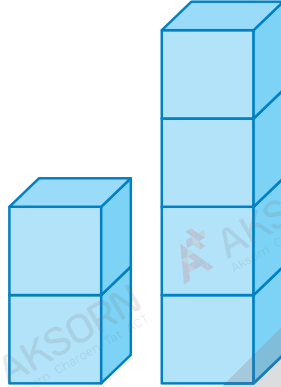
2   Compare the sets.

Tick ✓ the set that has fewer objects.
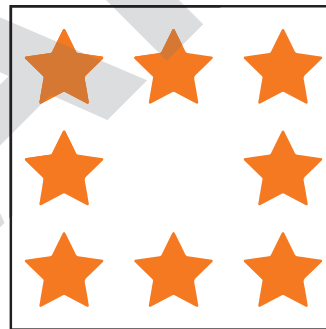
3   Compare the sets.

Tick ✓ the set that has more objects.

4 Compare the sets.

Tick ✓ the sets that have the same number of objects.
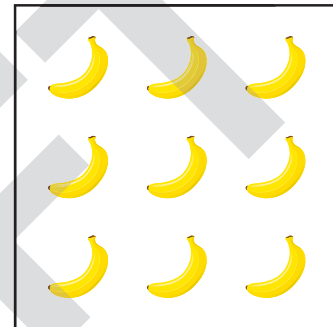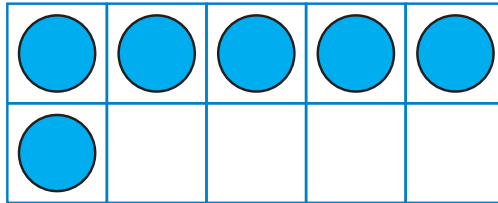
5 Compare the sets.

Complete the sentences.
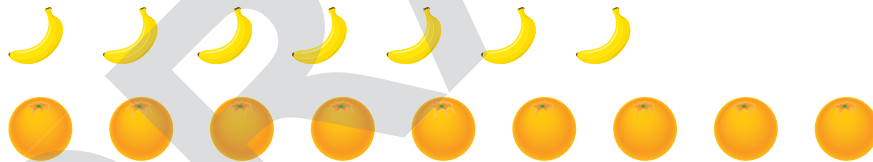
There are _____ 🍌 . There are _____ 🍊 .

There are more _____ than _____ , so there are

fewer _____ than _____ .

6 Compare the sets.

Complete the sentences.
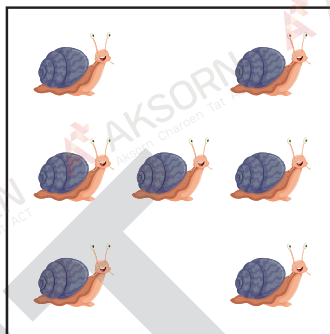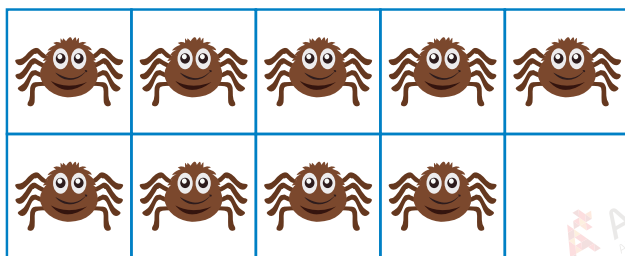
There are _____ 🕷.

There are _____ 🐌.

There are fewer _____ than _____ so there are more

_____ than _____.

7 is less than 9.

Use the number track to help you answer questions 8 to 10.

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

7 Look at question 6.

How many **more** spiders than snails?

How many fewer snails than spiders?

8 Write a number that is greater than 4.

9 Write a number that is less than 5.

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10 Draw a ring around the correct number to complete each sentence.

To find a number that is **more** than a given number, look along the number track towards the **1 / 10**.

To find a number that is **fewer** than a given number, look along the number track towards the **1 / 10**.

Let's investigate

Work with a partner or on your own.

Take 3 objects.

Take 1 more.

How many do you have now?

Take 1 more.

How many do you have now?

Repeat until you have 10 objects. What do you notice?

You have 10 objects.

Put 1 back.

How many do you have now?

Put another 1 back.

How many do you have now?

Repeat until you have 0 objects left. What do you notice?
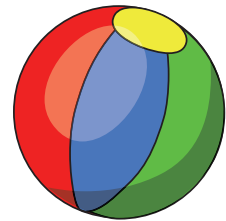
If you were going to start your investigation again, would you do anything differently?

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Look what I can do!

😐 😊

- I can compare two sets of numbers.
- I can say which set has more or fewer (or less or greater).
- I can recognise when two sets have the same number of objects.
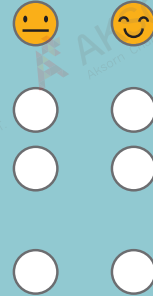
› 1.4 Number words

We are going to ...

- **say, read and write numbers and number words to 10.**

We can write numbers in words.

Coins often have words instead of numbers on them.

One Two Five Ten

We often use **words instead** of numbers in a story.

> zero: 0   one: 1   two: 2   three: 3   four: 4   five: 5
> six: 6   seven: 7   eight: 8   nine: 9   ten: 10

Exercise 1.4

1   Count the spots and read the number words.

0 zero	• 1 one	• • 2 two	• • • 3 three	• • • • 4 four	• • • • • 5 five

• • • • • • 6 six	• • • • • • • 7 seven	• • • • • • • • 8 eight	• • • • • • • • • 9 nine	• • • • • • • • • • 10 ten
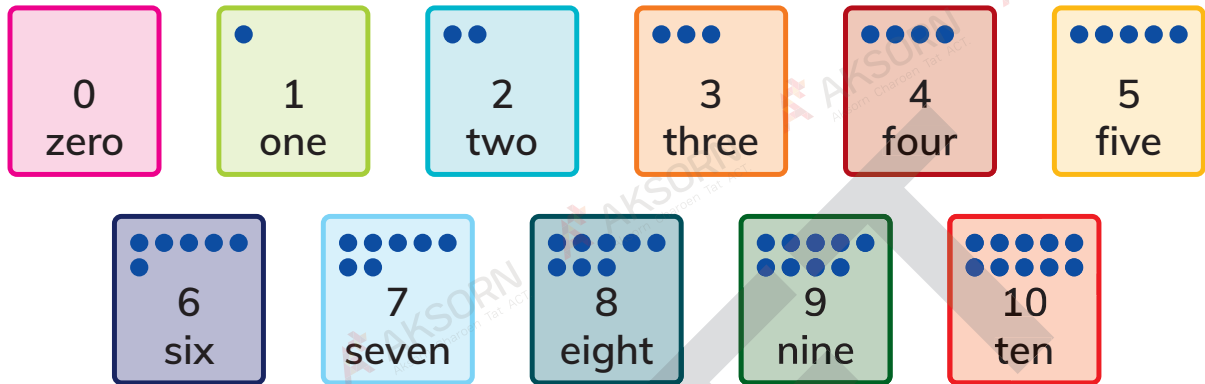
2   Write the missing word or number **on each ten frame**. The first one has been done for you.

1	2		4	
one		three		five
6	7		9	10
		eight		

3   Match the sets to the number words.

one

three

five

seven

nine

zero

two

four

six
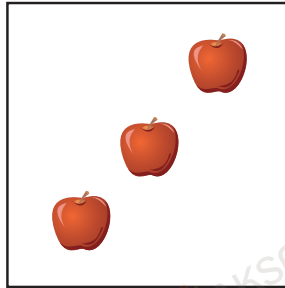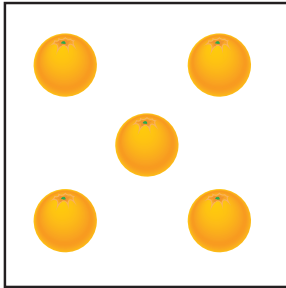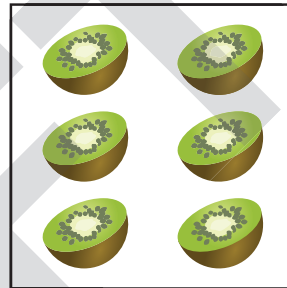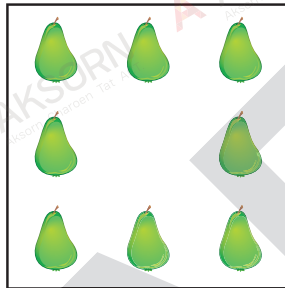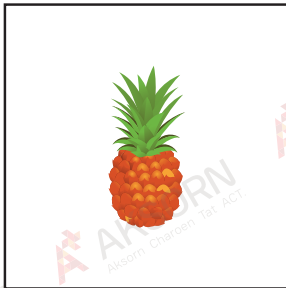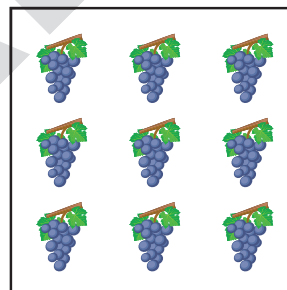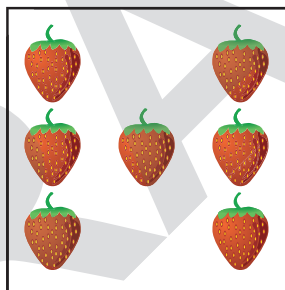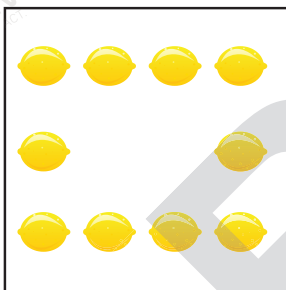
eight

ten

Which words do not have a matching set of fruit? _____

4   Draw eight apples.

Make it easy for others to quickly see how many there are.

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5 Draw a basket with **zero** fruit in it.

6 Write the number word after.

| one | | | four | | | eight | |
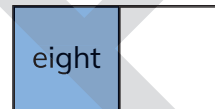
7 Write the number word **before**.

| | one | | | four | | | eight |
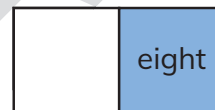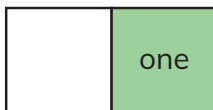
Can you read and write all the number words correctly?

Do you find the word track, word ten frame or domino layouts with number words helpful? Explain why.

Let's investigate

All the number words from zero to ten have either 3, 4 or 5 letters in the word.

Work with a partner to find out which number words have 3 letters, 4 letters or 5 letters.

continued

How do you know you have checked all the number words?

Are there any number words that have the same number of letters as that number?

Look what I can do!

😐 😊

- I can read all the number words from zero to ten.
- I can write some number words from zero to ten.

〉 1.5 Odd and even numbers

We are going to ...

- **find out about odd and even numbers.**

There are different kinds of numbers.

Some numbers are called even numbers. An even **number of objects** can be put into pairs with none left over.

even   odd   pair   pattern

Some numbers are called odd numbers. An odd number of objects always has 1 left over when the objects are put into pairs.

Exercise 1.5

Worked example 5

Draw a ring around the correct word for 3.

Use some cubes to help you.

odd / even

Answer: 1 pair and 1 left over. 3 is an (odd) number.

1   Is each number odd or even? Draw a ring around the correct word.
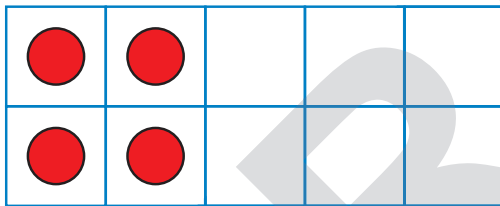
odd / even

| 8 | odd / even |
| 1 | odd / even |

2   Draw an odd number of counters on the ten frame.

Make it easy to see that it is odd.

32
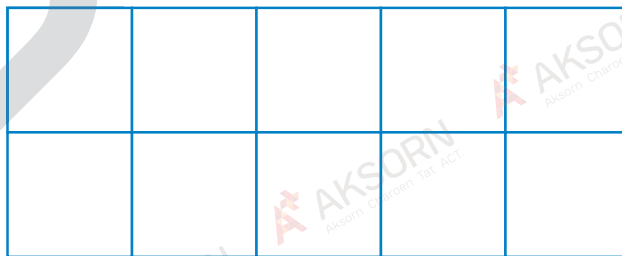
Do you need counters or other objects to find out if a number is odd or even?

Explain to your partner how you use the counters.

3   Colour the even numbers on the number track **red**.

Colour the odd numbers on the number track **blue**.

0	1	2	3	4	5	6	7	8	9	10

What pattern have you made?

_____

4   Is each number odd or even? Use the number track above to help you.

1	**odd / even**		7	**odd / even**
4	**odd / even**		10	**odd / even**

Worked example 6

6 is the answer.

What could the question be?

Answer:

- Which number is 2 more than 4?
- Which number is 4 fewer than 10?
- What is the next even number after 4?
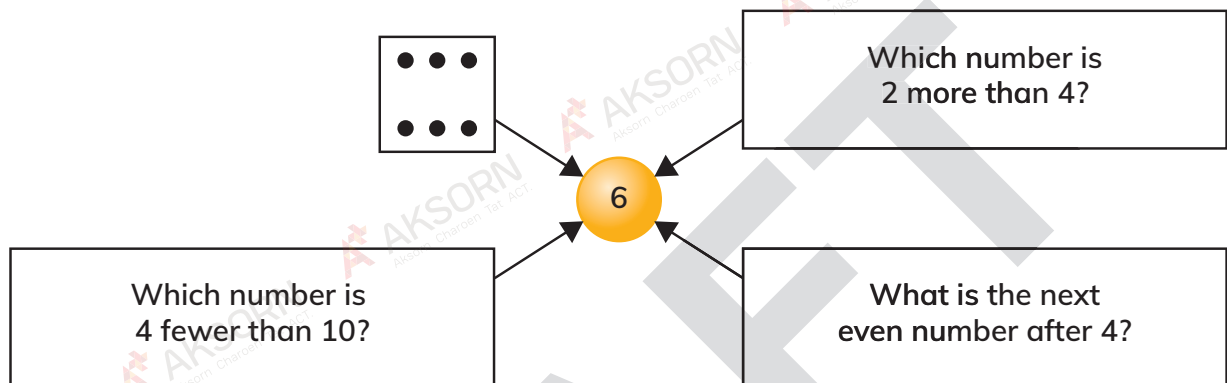
5   8 is the answer.
What could the question be?
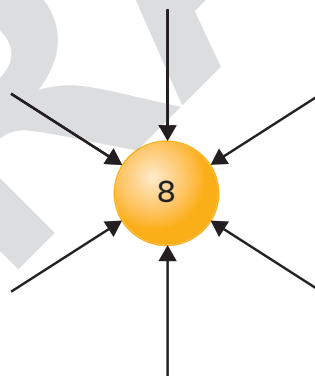
Look what I can do!

	😐	😊
• I can find out if a number from one to ten is odd or even.	◯	◯
• I can remember some odd and even numbers.	◯	◯
• I can describe the pattern of odd and even numbers.	◯	◯

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Check your progress

1 How many objects are there?
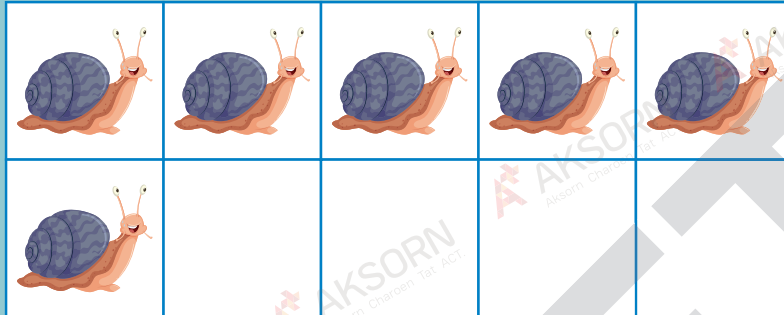
2 Estimate then count.

Estimate [ ] Count [ ]

Estimate [ ] Count [ ]
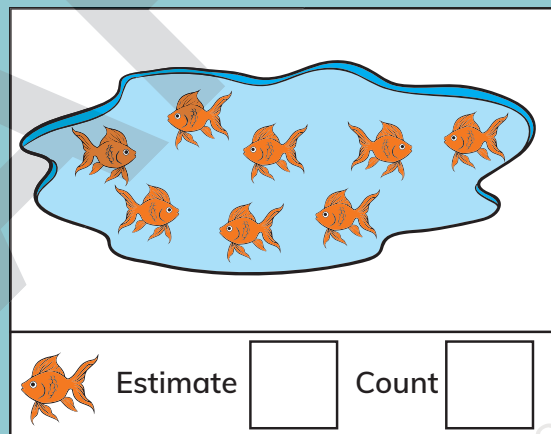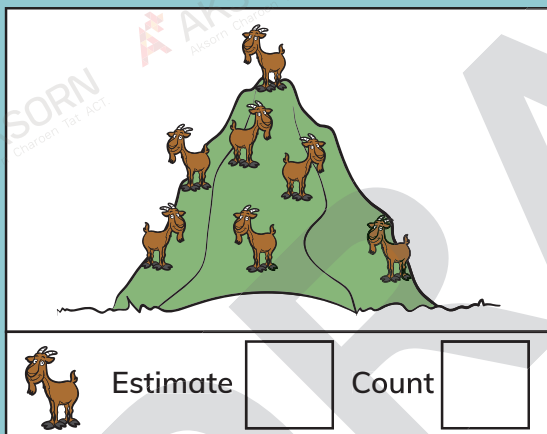
3 Draw a ring around the odd numbers.

7   2   6   9   1   8

CAMBRIDGE

Primary Mathematics

Teacher's Resource 1

Cherri Moseley & Janet Rees

Cambridge Assessment
International Education
Endorsed for teacher support

› Contents

Teaching notes

> 1 Numbers to 10

Unit plan

Topic	Approximate number of learning hours	Outline of learning content	Resources
1.1 Counting sets of objects	3	Linking the value of numbers to quantities through counting. Introducing 0.	Learner's Book Section 1.1 Workbook Section 1.1 Resource sheet 1A Resource sheet 1B Resource sheet 1D Resource sheet 1E Resource sheet 1F Resource sheet 1G Resource sheet 1H Resource sheet 1I Resource sheet 1J Worksheet 1A Worksheet 1B Worksheet 1C Language worksheet 1A Language worksheet 1B Additional teaching ideas for Section 1.1
1.2 Say, read and write numbers to 10	3	Using number rhymes to help recall and use the correct order of the number words.	Learner's Book Section 1.2 Workbook Section 1.2 Resource sheet 1C Resource sheet 1D Resource sheet 1M Additional teaching ideas for Section 1.2 **Digital Classroom:** interactive number track

1.3 Comparing numbers	3	Comparing small quantities using more than, less than, greater than, fewer than and the same as.	Learner's Book Section 1.3 Workbook Section 1.3 Resource sheet 1D Resource sheet 1E Resource sheet 1F Resource sheet 1J Additional teaching ideas for Section 1.3
1.4 Number words	3	Learning the written word for numbers to 10, including zero.	Learner's Book Section 1.4 Workbook Section 1.4 Resource sheet 1D Resource sheet 1F Resource sheet 1G Resource sheet 1K Additional teaching ideas for Section 1.4
1.5 Odd and even numbers	3	Exploring odd and even numbers through making pairs and looking at the pattern of the numbers.	Learner's Book Section 1.5 Workbook Section 1.5 Resource sheet 1B Resource sheet 1D Resource sheet 1G Resource sheet 1L Additional teaching ideas for Section 1.5
Cross-unit resources			
Digital Classroom: Unit 1 video **Digital Classroom:** Unit 1 activity Diagnostic check and answers Learner's Book Check your progress Language worksheet 1A Language worksheet 1B			

Thinking and Working Mathematically questions in Unit 1

	TWM characteristics covered
Learner's Book	
Exercise 1.1 question 7	TWM.02
Exercise 1.1 question 8	TWM.01 and TWM.02
Exercise 1.2 question 6	TWM.02
Exercise 1.2 question 7	TWM.02
Exercise 1.3 question 5	TWM.01, TWM.02 and TWM.03
Exercise 1.3 question 8	TWM.02
Exercise 1.3 Let's investigate	TWM.01, TWM.02 and TWM.03
Exercise 1.4 question 6	TWM.02
Exercise 1.4 Let's investigate	TWM.03 and TWM.04
Exercise 1.5 question 2	TWM.02
Exercise 1.5 question 3	TWM.02
Exercise 1.5 question 4	TWM.02
Exercise 1.5 Let's investigate	TWM.02 and TWM.03
Exercise 1.5 question 5	TWM.03
Workbook	
Exercise 1.1 question 3	TWM.01 and TWM.02
Exercise 1.1 question 7	TWM.01, TWM.02 and TWM.03
Exercise 1.1 question 8	TWM.01, TWM.02 and TWM.03
Exercise 1.2 question 5	TWM.01 and TWM.02
Exercise 1.2 question 7	TWM.01 and TWM.02
Exercise 1.2 question 9	TWM.01 and TWM.02
Exercise 1.3 question 1	TWM.01 and TWM.02
Exercise 1.3 question 6	TWM.01 and TWM.02
Exercise 1.3 question 12	TWM.01 and TWM.02
Exercise 1.4 question 4	TWM.01 and TWM.02
Exercise 1.5 question 1	TWM.01, TWM.02, TWM.03 and TWM.04
Exercise 1.5 question 6	TWM.03 and TWM.04
Exercise 1.5 question 7	TWM.03 and TWM.04

BACKGROUND KNOWLEDGE

This unit teaches learners how to count objects and actions up to 10. Learners will develop their understanding of the first three counting principles:

- The one-one principle. Learners must say only one number name for each object they are counting. Pointing to or touching each object

as they say the number names in the correct order is important as it helps to ensure that all the objects in the set are included in the count.

- The stable-order principle. Learners must say the number words in the correct order.

CONTINUED

At first, the words may be said with little understanding of what they mean.

- The cardinal principle. Over time, learners will recognise that the last number said tells them how many objects they have counted.

Learners will also recognise that they can count objects and actions in any order, the total will still be the same.

As learners develop some understanding of the value of each of the numbers to 10, they will begin to be able to compare them and explore simple patterns.

These are key early steps toward developing a sense of number. The deeper the understanding of single-digit numbers and 10, the easier it will be to extend understanding to the rest of our number system. For this reason, the first half of the year explores numbers to 10, extending to 20 in the second half of the year.

Digital Classroom: Use the Unit 1 video to introduce the different ways that numbers are used, for example, as labels or to show how many items there are. The i button will explain how to use the video.

Supporting learners with the Getting started exercise

If learners struggle with the Learner's Book questions, provide more experience with numbers to 5. Counting to at least 5 should be secure before learners move on to counting to 10.

- Use the *Cambridge Primary Mathematics Starter Books, A, B and C.* Book A focuses on numbers to 5, Book B focuses on numbers to 7 and Book C focuses on numbers to 10. Some activities overlap with the content in Unit 1, making the books a useful source of other activities.
- Use the spinner templates in **Resource sheet 1A** for learners to spin, say the number and count out that many objects.
- Use **Resource sheet 1B** for learners to order numbers to 5.

TEACHING SKILLS FOCUS

Manipulatives

Learners learn so much more and develop a deeper understanding if they explore and discover for themselves. Using manipulatives allows learners to see the mathematics for themselves. When they make physical changes to a set of objects, learners can see the effect of their actions. Seeing what is meant by mathematical words such as *more than*, *fewer than*, *the same*, *odd* and *even* helps learners to develop deep understanding.

Learners should use a wide range of materials to explore numbers and their characteristics. Manipulatives could be counters, cubes, small stones, beans or something else. If possible, use small counting objects that link with any current topic. Each object represents one. To prevent misconceptions from developing, use only small whole objects at this stage. Set aside one session for learners to play with manipulatives before expecting them to use these to support their learning. Work alongside the learners, making suggestions but not doing it for them. Watching someone else moving objects around is not enough – learners need to experience this for themselves.

Pictures within the Learner's Book and Workbook reflect the classroom experiences of the learners. Encourage learners to get out similar materials (if available) to manipulate to support their developing understanding.

At the end of this unit, consider which manipulatives were regularly used by the learners.

- Should you consider changing some of these?
- Have you organised the classroom so that learners have access to these resources whenever they are doing any mathematics and perhaps at other times too?
- Could your classroom now be considered an active learning environment? (More on this in Unit 3.)
- If colleagues came into your classroom, could they tell that learners were engaged in mathematics?

1.1 Counting sets of objects

LESSON PLAN

Learning objectives	Learning intentions	Success criteria
1Nc.01	• Count objects from zero to 10, recognising conservation of number and one-to-one correspondence.	• Learners can successfully count any collection of up to 10 objects. • They say the number names in order, say one number for each object and recognise that the last number said is the total. • Learners also recognise that the order they count the objects in does not matter.
1Nc.02	• Recognise the number of objects presented in familiar patterns up to 10, without counting.	• Learners are beginning to subitise, that is, know how many without counting. • Learners recognise familiar patterns of objects on a ten frame or in a domino pattern and smaller quantities in random arrangements.
1Nc.03	• Estimate the number of objects or people (up to 10) and check by counting.	Learners are beginning to get a sense of numbers and can give a sensible estimate of how many when they cannot immediately subitise.
1Np.01	• Understand that zero represents none of something.	Learners can label an empty box, a blank domino and other examples with 0.

LANGUAGE SUPPORT

Learning a new word or phrase in mathematics is just the same as learning a new word when speaking or writing. Draw learners' attention to the word and explain its meaning. Say it and write it, or point out the written word. Then model its use and encourage learners to use it appropriately. Reading a word is usually easier than writing it at first. Provide learners with a copy of the word for them to copy when writing, but gradually remove this support.

Estimate: a guess that is influenced by what you know already

How many are there?: a question asking you to find out how many objects are in the set

Row: a set of objects or pictures arranged in a line

Set: a group of things

Subitise (or subitize): know how many without counting due to familiar pattern layouts

Total: how many there are altogether

Common misconceptions

Misconception	How to identify	How to overcome
Learners miscount because they do not arrange objects in a row or pattern and therefore include the same object twice or miss it altogether.	Give learners small collections to count.	Encourage learners to touch and move each object as they count it. This could be counting from one container to another. Slowing down and exaggerating the movement should help. Then encourage learners to arrange objects in a row, on a ten frame or in another pattern to support counting.
Learners do not recognise that the last number said is the total. When asked how many, they count again.	When you ask learners to get you four of something and they present a different quantity.	Practise counting, including placing objects in a row alongside a number track. Focus on the last object, saying, for example '1, 2, 3, 4. That's 4 altogether.', with finger resting on the last object or the number on the number track.

Starter idea

What is inside? (10 minutes + 10 minutes Getting started exercise)

Resources: Box or gift bag with some objects inside. No more than 5 of any set, for example 1 key, 2 pencils, 3 large buttons, 4 small toys and 5 bricks. Alternatively, link the objects to your current topic.

Description: During this activity, give learners the opportunity to talk about their own experiences of numbers. Support learners to recognise when a number has been used for counting and when it is just a label.

- Tell the learners that you found this box (or bag) but you cannot remember what is in it. Tip the objects out onto a tray and ask learners to help you to put them into groups and count them.

- Ask a learner to find all the buttons (for example), show the class and then count them together. Repeat for the other objects. Focus on giving the learners who found the diagnostic check difficult plenty of counting practice. As objects are counted, make a list on the board to remind yourself what was in the box. When all objects are counted, read the list together.

- Look out for learners who recognise the numbers and those who find this difficult. Ask questions such as 'How many buttons are there?' to assess recognition of numbers to 5.

After this activity, ask the learners to complete the **Getting started** exercise in the Learner's Book. This will allow you to see if there is anything further that needs revising before you start the rest of the unit.

Main teaching ideas

How many are there? (40 minutes)

Learning intention: Learners can count a collection of up to ten objects correctly by arranging objects in a row and touching or pointing to each object in turn as they count. Learners say one counting number for each object and in the correct order.

Resources: Small counting objects, small pots, **Resource sheet 1D** (cut into cards and remove the 0 number card).

Description: This activity is good for counting to find out how many, including reinforcing that the last number said is the total.

- Show learners a small quantity of objects, say five, in the palm of your hand. Explain that you would like to find out how many there are, to know if you need to get any more.

- Deliberately miscount, saying the same number twice, missing one out or something else. Ask the learners to explain where you went wrong.

- Suggest that if you line the objects up in a line it will be easier to find out how many there are.

- Touch each object as you count with the learners.

- Repeat with the same objects but in a different order to show that it does not matter which object you start with the total is the same. You could also spread them out or bunch them together to show that the total stays the same.

- Give the learners small collections of up to ten objects to count, with each set in a pot. Set up the

collections so that each group has the same objects, for example two beans, three counters, four linking cubes, five buttons and so on.

- Carry out formative assessment by observing learner's counting strategies. If necessary, support learners to put objects in a line, touch or move them as they count.

- Give each group of learners a set of 1 to 10 cards. As you move around the groups, ask learners to label their collections with a number card.

- Ask learners to spread out or bunch up the objects they have just counted, then ask if they need to count again. Check that learners recognise nothing has changed, so the total is the same.

Give learners lots of opportunity to count objects in further sessions. After counting a given quantity, learners can move on to taking a given number from a larger collection, for example, seven buttons from a box of buttons.

- Show learners how to find **Exercise 1.1 question 1** in the Learner's Book.

- Invite a learner to choose which set of pictures to count. Count together, with everyone touching each picture in turn. Agree how many. Show learners the matching number and ask them to find that number from the set of number cards.

- Repeat with a different set. Then ask learners to work in pairs, taking it in turns to choose which set to count and find the matching number.

After this activity, learners could try **Learner's Book Exercise 1.1**, revisiting **question 1** and moving on to **question 2** and **Workbook Exercise 1.1 questions 1 and 4**.

Answers: Collections are correctly counted. Learners are beginning to select the correct number to label each collection.

> **Differentiation ideas:** Give learners who struggle smaller collections to count, working with numbers up to 5 before extending gradually to 10. To challenge some learners, ask questions such as 'What if there was another one? How many would there be then?'

Introducing the ten frame (40 minutes)

Learning intention: Recognise the number of objects presented in familiar patterns up to 10, without counting. Learners can use the ten frame to support counting and begin to recognise quantities on this layout without counting.

Resources: Resource sheet 1D, **Resource sheet 1E**, **Resource sheet 1G**, **Resource sheet 1H**, a range of counting objects including counters and cubes.

Description:

The ten frame is a useful tool for organising objects when counting them. It ensures objects are placed in a line. Using a consistent layout on the ten frame will build recognition of quantities without counting.

- Show the learners a ten frame without naming it. Count the spaces together and then explain that it is called a ten frame because if you put one object in each space a full ten frame always has 10 objects. Explain that the ten frame is also useful for seeing how many there are quickly. As learners get used to seeing objects in a ten frame, they will not always need to count.

- Place a counter in the first space (top left), check that everyone can see one counter. Explain that if learners always start in the same place, they will find it easier to see how many there are.

- Repeat for two counters, then three, adding counters along the top row.

- Once the learners have seen three counters in a row and identified that as 3, move the counters to random places on the ten frame. Check that learners can see that it is harder to tell how many there are when the objects are in random positions.

- Return the counters to their original positions. Continue to 5, emphasising that 5 is a full top row. Continue to 6, focusing on 5 and 1 more. Continue to 10, emphasising that the ten frame is full so there are 10 objects. You could also mention that there are two rows of 5, 10 altogether.

- Show learners a ten frame with no counters on. Introduce 0 as the number for none. There are no counters on the ten frame, so there are 0 counters. Show learners the 0 number card.

- Give pairs of learners sets of ten frame cards cut from **Resource sheet 1E**.

- Ask learners to put these in order, starting with 1 counter, then 2 and so on, counting to check.

- Ask learners to place the matching number on the ten frame. Give learners some copies of **Resource sheet 1G**. Using **Resource sheet 1H**, learners can then take it in turns to spin the spinner and place that many objects on the ten frame, using the ordered set for support. Partners can check that the correct number of objects has been placed on the ten frame before taking their own turn. Learners should always start from the top left, completing the first row before moving on to the second row.

- As learners work, listen out for those who are beginning to know how many without counting. For example, if a learner spins 6, do they first put a counter on the left-hand side of the bottom row and then fill the top row. Ask the learner how they knew that would be 6 objects. These learners are demonstrating metacognition as they have evaluated their learning and made changes to their behaviour.

After this activity, learners could try **Learner's Book Exercise 1.1 question 3**.

Answers: Ten frame layout used to support counting and some learners are beginning to recognise how many there are without counting.

> **Differentiation ideas:** Some learners will benefit from using a 1 to 5 spinner first, focusing on the top row of the ten frame only. Encourage learners who find this straightforward to place what would be the last counter in the ten frame first, then back fill. Are the learners correct or do they need to make an adjustment?

Plenary idea

Say how many without counting (10 minutes)

Resources: Set of cards from each of **Resource sheet 1E**, **Resource sheet 1F** and **Resource sheet 1J**.

Description:

- Arrange the cards in random order, mixing the random, ten frame and domino layouts.

- Show each card asking learners to quickly call out how many there are.

- After running through all the layouts once, choose some cards and ask learners to explain what they see. For example, in the ten frame layout for 8, do they see a 5 and a 3, or 6 and a 2, or something else?

For the domino layout for 8, do they see two rows of 3 and two ones or something else?

The ten frame is more structured and perhaps has a 'right' answer, but that is less true of the dominoes and random layouts. Learners need to begin to see smaller numbers within the whole, ready for addition and number bonds.

> **Assessment ideas:** Do learners quickly recognise layouts? Repeat layouts that learners find difficult more often, pausing to count to reinforce how many there are. Are learners beginning to see smaller sets within sets? Praise all comments as they are all equally valid.

Guidance on selected Thinking and Working Mathematically questions

Learner's Book Exercise 1.1 question 8

Estimating uses all of a learner's current number skills. Through counting objects and looking at patterns, learners are beginning to understand what is meant by each number. They are **generalising** when they apply the number to the set, regardless of what the set contains. When learners estimate, they are matching what they see to their internalised ideas of how many each number represents. At first, this will be difficult because the learners' ideas of number are still being developed. Many learners want to be right and find it hard to resist simply counting. They are also **conjecturing** that what they see matches their idea of a particular number, when the learner's understanding of that number is still developing. Estimates are likely to be rather different to the actual count, but will improve over time.

It is reasonable for estimates to be very different to the actual count at first. Learners will quickly count small numbers of quantities, so it is better to ask for estimates for 5 or more objects. Always follow up an estimate with counting. Some learners will find it helpful to have a known pattern within sight when they estimate so that they can compare what they see with the pattern.

CROSS-CURRICULAR LINKS

There are objects to count everywhere. Count objects linked to a particular topic, for example, seeds for a growing topic. Whatever learners are counting, encourage the use of the ten frame or the domino layout to confirm the count or to enable the learner to see how many there are without counting.

Homework ideas

1 Ask learners to count at home and report back what it was they counted. Did they put objects in a row, a ten frame layout or a domino (or dice) layout to check? Give learners the opportunity to demonstrate what they did if possible.

2 Parents and carers may not have seen a ten frame before. Give learners a ten frame to take home. Ask them to explain to their parent or carer why it is called a ten frame and how it helps them to count.

1.2 Say, read and write numbers to 10

LESSON PLAN

Learning objectives	Learning intentions	Success criteria
1Ni.01	• Recite, read and write whole numbers from 0 to 10.	• Learners can say some number rhymes. • Learners can count to 10 and find a missing number. • Learners can read and write the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.

LANGUAGE SUPPORT

After: behind, next in place

Before: in front of, previous in place

Between: in the space separating at least two objects or numbers

Count: say the number names in the correct order, often to find out how many objects

Next: beside, usually after

Number: a label that tells you how many objects in the set

Order: know what comes before and after

Point: put a finger on or close to something to draw attention to it

Track: the counting numbers in order, one number in each space

Common misconceptions

Misconception	How to identify	How to overcome
Learners say the numbers in random order.	Ask learners to say what comes next in a number rhyme. Ask learners to count from 1 to 5, later 1 to 10 without using a number rhyme.	Ask learners to use a number track for support, working from left to right and putting a finger on each number as it is said.
Learners repeat or miss out a number when counting.	Ask learners to say what comes next in a number rhyme. Ask learners to count from 1 to 5, later 1 to 10 without using a number rhyme.	Start to repeat or miss out a number rhyme verse, then stop, asking learners to explain what you have done wrong. Encourage learners to use a number track for support, working from left to right and putting a finger on each number as it is said.

Misconception	How to identify	How to overcome
Learners reverse digits such as 3, making a 3 look like 5.	Ask learners to record their count.	Encourage learners to trace over large numbers made from tactile paper, plastic or wood. Give learners a number track to copy from.

Starter idea

Number rhymes (10 minutes)

Resources: Resource sheet 1D, **Resource sheet 1M** and any props needed to act out the rhyme.

Description:

- Share a familiar number rhyme with the learners, one they are likely to have learned in kindergarten or preschool. Act out the rhyme using props and number cards to link what is said with how the number is written.

- Start with rhymes that count forward in ones from 1 to 5, then 1 to 10. Ask learners to draw that number in the air and later on a mini whiteboard.

- Show learners how to find the number rhyme in **Exercise 1.2 question 1** in the Learner's Book.

- Say the rhyme together, asking learners to point to each number as it is said or to show that many on their fingers.

- Give learners the opportunity to say their favourite rhyme to their partner, as in **Exercise 1.2 question 2**.

- When a number rhyme is established, make a deliberate mistake such as repeating a verse or missing out a verse. If learners do not tell you that something was incorrect, stop and ask them to explain where you went wrong.

- Complete the rhyme correctly together.

- You will need to revisit this starter several times so that learners become confident in the order of numbers from 1 to 10. Look out for learners joining in and those who are not. Clarify the order of the numbers by sometimes stopping and asking which number is next.

Main teaching idea

Numbers and the number track (40 minutes)

Learning intention: Say the numbers in order, begin to read the numbers on a number track, begin to write numbers.

Resources: Number rhyme (or song or story) illustrations or resources, 1 to 10 number track with each number covered up with an easily removed cover, mini whiteboards and pens (or paper and pens).

Description: This activity is useful for linking the spoken word to the written number. The activity will also support the early writing of numbers as learners begin to record numbers.

- Say the beginning of a popular number rhyme together. Ask learners to tell you which number (or numbers) they said.

- Ask learners what the number 1 looks like. Invite some or all learners to write it in the air, on paper or on their mini whiteboards or the class board, depending on your available resources.

- Choose some of the written numbers and ask other learners if they think the number is correct.

- Explain that a number track has the numbers on it in order. Explain that when we count, we start with 1, so the number 1 is at the beginning of the track. This would be a good opportunity to explain that there is no 0 on a number track, because when we count objects, we start with 1.

- Remove the cover from a number on the number track to reveal the number. Check with learners that this is correct. You might ask learners to write it again now that they have the visual prompt.

- Repeat with 2 and 3, inviting a learner to reveal the number.

- Reveal the rest of the number track one number at a time, asking learners to read the number with you.

- When revealed, count along the whole track together.

After this activity, learners could try **Learner's Book Exercise 1.2 question 3** and **Workbook Exercise 1.2 questions 1 and 2**.

You may need to repeat this activity several times. Use a different rhyme (or story).

Answers: Numbers correctly identified verbally and on number track. Numbers beginning to be written clearly.

› **Differentiation ideas:**

- Differentiation will occur through whom you choose to predict or write the number then reveal it. This could be a single learner, but asking different learners to do each part will extend your coverage. Target learners who found it difficult to identify a number in the Diagnostic check.

- Follow up questions such as 'Were you right?' and 'How do you know?' will encourage learners to explain their thinking, giving further opportunity to monitor understanding. To support learners who find this difficult, ensure that they have a copy of the number track in sight. To challenge learners who find this straightforward, ask them more complex questions such as 'How do you know?'.

Plenary idea

Sorting number tracks (10 minutes)

Resources: Number tracks for numbers 1 to 10, some with a range of errors and some correct number tracks.

Description:

- Give out number tracks, one per learner.

- Ask learners to identify the error on the track. Briefly share the different errors and list them: missing number, repeated number, swapped number (or numbers), correct number track.

- Identify an area of the room for each type of number track.

- Learners walk to the appropriate area and check each other's number tracks to ensure they have the same type of error.

- Give learners time to tell each other how to correct the error on their number track. You could count the learners in each area and conclude which error occurred the most often or least often.

- Bring the learners back together, collect the number tracks and repeat the activity, handing out the number tracks randomly. If there is enough time, you could extend discussions to who had the same error as last time.

› **Assessment ideas:** Peer assessment occurs when learners in each group check that others in the group have the same type of error and when they talk within the group about how to correct it. Look out for learners identifying the type of error quickly and those who need some support.

Ask learners to consider what it is that they know that helps them to notice the errors and also know how

to correct them. This is metacognitive behaviour, as learners think specifically about their own learning.

Guidance on selected Thinking and Working Mathematically questions

Learner's Book Exercise 1.2 Reflection

When using a number rhyme to recall the order of the numbers, learners are **generalising**, recognising that the numbers always come in the same order. When learners realise what it is that helps them to identify the order of the numbers and share it with a friend, they are beginning to classify numbers and open themselves to other ideas. They may also **critique** what other learners do, comparing and evaluating methods. If learners like a different method that has been shared with them, they may choose to adopt that method themselves.

Within any discussion and sharing of ideas, there will be those who are willing to consider other methods and those who are not. Try not to be judgemental about this. Some learners may simply observe and later add a method to their own toolbox. Be a good example – tell learners that you found Sam's or Jo's method helpful and that you will use that yourself. Alternatively, explain that you did not really understand a particular method and you are sticking with the way you know.

CROSS-CURRICULAR LINKS

- Numbers are everywhere and we often use them without thinking. Encourage learners to notice numbers in all that they do. This could be page numbers in a reading book or topic book or in a newspaper or magazine read at home. Numbers could also be used to label classrooms or in playground markings. Encourage learners to be number detectives, noticing numbers in other areas of the curriculum.

- Number rhymes could link to English/literacy stories and other curriculum areas depending on the chosen rhyme or story.

Homework idea

Ask learners to notice numbers at home. Invite them to bring in an example of what they have noticed. This could include packaging with a number on, a newspaper or magazine with numbered pages, a photograph of something they noticed or something else. Set up a table for learners to place their examples on. Learners could ask each other about what they brought in.

1.3 Comparing numbers

LESSON PLAN

Learning objectives	Learning intentions	Success criteria
1Np.03	• Understand the relative size of quantities to compare and order numbers from 0 to 10.	Learners can compare quantities, initially by direct comparison then by number, recognising quantities that are more/greater, less/fewer or the same as another quantity.
1Np.01	• Understand that zero represents none of something.	Learners recognise zero as a quantity and can compare it with other quantities or numbers.

LANGUAGE SUPPORT

Model the use of the language with the learners. Repeat back a question or sentence using the correct language when learners are beginning to use these words. Sometimes ask questions using two or three of the new words such as, 'Is that more than, fewer than or the same?' to support learners to consider which word is correct.

Compare: check if a number or set is the same, fewer than or more than another set

Comparison: the act of comparing

Equal: another way of saying that two sets have the same value

Fewer than: when we compare sets or numbers, we use fewer than (or less than) to show which set has the least

More than: when we compare sets or numbers, we use more than (or greater than) to show which set has the most

Same: when we compare sets or numbers, both sets do not have a different number of objects

Common misconceptions

Misconception	How to identify	How to overcome
Learners see more (or greater) and fewer (or less) as two different and separate things.	When learners have recognised one statement such as '4 is fewer than 6', ask learners to record a 'more than' statement using the same numbers.	Show learners how to physically swap the quantities over to generate the linked statement. Emphasise that the quantities have not changed.
Learners see quantities that are spaced apart as more or greater than those that are tightly grouped.	Set out the same quantity twice with different spacing. Set out two different quantities and give the lesser quantity greater spacing between the objects.	Ensure learners match objects one to one to directly compare quantities.

Starter idea

Using familiar language to explore *same* and *different* (10 minutes)

Resources: Two similar items of clothing, for example two T-shirts, but different colours, sizes and with different markings.

Description:

- Tell learners that we often compare things. We look at one thing and see how it is the same and different from another thing.

- Show learners two jumpers, T-shirts or other items of clothing and ask them to talk to their partner about what is the same and what is different about them.

- After a few moments, share ideas. Learners should recognise that the items are the same because they are both T-shirts (or whatever they are) but they are also different because one has words on the front and the other one does not or one is bigger than the other, depending on the differences.

- Explain that in mathematics, we look at how many are in a set and compare that with another set. Sometimes both sets will have the same number of objects in them. Sometimes they will have different numbers of objects in. Tell learners that they will be comparing the number of objects in each set in the next few lessons.

- Listen for learners using other comparison words such as *more* and *less* or *fewer* when they describe the features of the clothing. Use this as formative assessment, to inform you about which vocabulary to focus on in the following activities.

Main teaching idea

Direct comparison (40 minutes)

Learning intention: to directly compare two quantities, by matching one to one.

Resources: Counting corner materials from Section 1.2 or other small objects, two bowls for each pair of learners.

Description: This activity is good for comparing quantities directly and beginning to express those comparisons in mathematical sentences.

- Invite five learners to come to the front of the class, choosing either two boys and three girls or three boys and two girls.

- Ask each boy to stand next to a girl and any other boys or girls without a partner to stand on their own.

- Ask the rest of the learners if there are more boys than girls at the front of the class. Ask them to explain how they know. Since learners have been paired, it is easy to compare boys and girls.

- Ask if there are fewer boys than girls and link what the learners have said. For example, if there are more boys than girls, there are fewer girls than boys. Both statements are true at the same time.

- Now ask learners to work with a partner. Give each pair two bowls and ten objects.

- Learners take it in turns to put some objects in one bowl and the rest in the other. They then put the contents of each bowl in a line and compare them. Encourage learners to place the two lines next to each other, so they match up each item in one row with an item in the other row.

- Learners can then describe the comparison to each other, for example 'There were more cubes in the blue bowl this time.' As you move around the room, listen out for words such as 'fewer', 'less', 'more' and 'same'.

- Ask all the learners to pair up, a boy with a girl. Ask any learners who are left over to come to the front.

- Invite learners to describe what they see in a sentence. Sentences might include:

  There are more girls than boys in our class. There are fewer boys than girls.

- Explain that most people usually use 'less' in everyday life. This is correct when things cannot be counted, for example sand or water. For things that can be counted and for people, the correct mathematical word is 'fewer', for example, there are fewer boys than girls in our class.

After this activity, learners could try **Learner's Book Exercise 1.3 questions 1, 2, 3 and 4** and **Workbook Exercise 1.3 questions 1, 2, 3, 4, 5 and 6**.

Answers: Learners compare sets of objects, verbalising their observations in mathematical sentences.

> **Differentiation ideas:** Encourage some pairs of learners to put a smaller number of objects, such as 1, 2 or 3, in one of the bowls. It is easier to compare amounts that are very different. Challenge other learners to count how many in each line once they have taken the objects out of the bowls and put them into lines, so that they can also say, for example, 2 is fewer than 8.

Plenary idea

Comparing numbers (10 minutes)

Resources: Set of 43 cards illustrating 11 ten frames using **Resource sheet 1E**, 10 domino layouts using **Resource sheet 1F**, 11 random arrangements using **Resource sheet 1J** and **Resource sheet 1D**.

Description:

- Shuffle the set of **Resource sheet 1F** and turn over the first two, displaying them with a space between.

- Learners must decide which wording belongs between the two cards. The learners have a choice of three statements to place between the two cards: *is greater than*, *is fewer than, is the same as*. Learners could offer suggestions to the whole class, work as two teams or work in pairs if there are sufficient sets of cards.

- This plenary can be repeated several times since the random nature of the cards displayed will make it different each time.

- If playing as a class, allow some selections to be made quickly to ensure the game is played at a good pace. Occasionally pause and ask questions such as, 'How do you know?' 'What makes you think that?' 'What if the cards where swapped over – which words would you choose then?'

> **Assessment ideas:** Target questions as above to make learners think. Learners should be able to explain their thinking, but most learners will benefit from some practice. Support those who struggle by asking questions such as 'Why can't it be this one?' Eliminating what it cannot be will help learners to identify the correct response.

Are learners developing their understanding of making and expressing comparisons? If a similar error is being made repeatedly, think back to your explanations. Do you need to revisit them? Make sure you illustrate all explanations with physical examples and give the learners opportunities to create their own physical or pictorial examples.

Guidance on selected Thinking and Working Mathematically questions

Learner's Book Exercise 1.3 Let's investigate

As learners work their way through the investigation, they will be **conjecturing** about what they have noticed as they look for a pattern. As learners identify a pattern, they will continue the investigation, checking that the pattern continues to convince themselves that they are correct.

Support learners by encouraging them to record each answer. As they record 3, 4, 5, 6 . . . learners should notice that they are counting forwards each time they take another object for their collection.

Learners may find it hard to express what they notice and to summarise it. Support learners by asking questions such as 'How does how many you have change each time you take another object?'

Some learners will be able to **generalise** that adding one more makes the next counting number, though they may express that in different ways. Having completed the first part of the investigation, they may find the second part more straightforward and reach a similar conclusion about putting one back – taking one away makes the counting number before. Remember, learners have not yet explored addition and subtraction. They will have added and subtracted as they have carried out various activities but not in any formal way. It is therefore unhelpful to talk about adding and subtracting at this time. Instead, focus on *more than* and *fewer than*.

Some learners may benefit from having a number track nearby or by placing their objects on a ten frame to count them. As they progress through the activity, they may not remove the counters from the ten frame, simply placing one more directly on to the ten frame or removing one from it. To recognise a pattern, learners will need to focus on the number that they had and how that changed, so linking to the number track will be helpful. Ask learners to attach a peg to the number on the number track, then move it when they change the quantity. This is more secure than using a counter and having to move the peg along the track helps learners to focus on what changed.

CROSS-CURRICULAR LINKS

- Ask learners to look out for when they compare objects in other areas of the curriculum. When looking for what is the same and what is different, they may discuss features rather than quantities, so they are making different types of comparisons, but they are still comparing one thing or set with another thing or set.

- In later sessions, learners will compare lengths, heights, weights and capacities as well as quantities.

Homework ideas

1   Ask children to explore food packaging with numbers on, comparing the number contained within two

multipacks. Learners need to work with numbers up to 10 and record their observations in sentences such as 'There are 6 chocolate biscuits and 4 apples. There are fewer apples than chocolate biscuits. 6 is more than 4.' Learners can bring in the empty multipacks and share their observations with the class.

2   Learners could use the items brought in as props for asking each other comparison questions. These could be, 'Can you find two packets that had the same number in them?', 'Can you find a pack which had fewer in than the pack of oranges?' and so on.

1.4 Number words

LESSON PLAN

Learning objectives	Learning intentions	Success criteria
1Ni.01	• Recite, read and write number names and numbers from zero to 10.	• Learners can read the number words zero, one, two, three, four, five, six, seven, eight, nine and ten. • Learners are beginning to write the number names, though there may be some spelling errors.
1Np.01	• Understand that zero represents none of something.	Learners can label an empty box, blank domino or other examples with 0 or zero. They are beginning to recognise why there is no 0 on a number track or ten frame.

LANGUAGE SUPPORT

In this section, learners are exploring numbers in words, a very language-based activity. Learners will link the number words with the counting support frameworks they already use: number track, ten frame and domino layout. This will help learners to develop recognition of the number words and how each word is written.

Zero: 0

One: 1

Two: 2

Three: 3

Four: 4

Five: 5

Six: 6

Seven: 7

Eight: 8

Nine: 9

Ten: 10

Common misconceptions

Misconception	How to identify	How to overcome
Number and number word mismatched as learner only refers to the initial letter of the number word.	Match numbers and number words.	Focus on the spelling of each word. Make other links between numbers and number words, for example seven is more than six and its word is longer.

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Starter idea

Numbers in words (10 minutes)

Resources: Story with numbers in words, coins with words rather than numbers on if relevant, other examples of numbers in words, number track.

Description:

- Show the learners the number track and explain that the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 are often written as words.

- Show learners the number words in a story or on the front cover. Explain that reading numbers means being able to read them in words as well as in numbers.

- Pass around coins, books and other objects with number words so that learners can see for themselves that words, not numbers, have been used.

- Choose a familiar story that uses number words. Share a short extract with the learners, showing them what you saw that made you say a number. If there is time, list the numbers with the words next to them for all the learners to see.

- Focus on the fact that every number has its own word. Some start with the same letter, some do not. Learners must look at the whole word to be sure they have the correct word.

Main teaching idea

Number track match (40 minutes)

Learning intention: Match numbers and number words to develop recognition of number words. Learners are beginning to recognise some number words.

Resources: A set of cards from each of **Resource sheet 1D** and **Resource sheet 1K** for each table, blank 11-space number tracks (large enough to write the number words on).

Description: This activity is useful for linking the number words to the relevant numbers, ensuring that learners focus on the whole word, not just the initial letter as some number words have the same initial letter.

- Count along the number cards together from 1 to 10.

- Ask learners where 0 belongs in the order of the numbers. Agree that it sits before 1.

- Explain that 0 isn't usually shown on a number track because the track is used for counting objects, matching one object to each space. The last number matched gives the total. If there was a zero square,

learners might make the mistake of matching the first object with zero.

- Position the 0 card before 1. Show the learners three objects, matching them to 0, 1 and 2 to show that the last number matched is 2, which is not correct, there are three objects. Go on to explain that it is still important to know how to write zero, so you have included the 0 card.

- Show learners the word zero, sound it out and say it together, then match with the number card.

- Repeat for all the number words until you have a number row and a matching word row.

- Count along the number row then the word row, checking that learners realise that they say the same thing whether they see the word or the number. We always say the number words in the same order when we count, just like the numbers.

- Give learners a blank number track with 11 spaces.

- Tell learners that they are going to complete their own number word track. This will help them to recall the number words. Remind learners that the first space is for zero. Provide sets of number word cards for each table.

- When the tracks are complete, bring the learners back together.

- Read along the number word track together. Then ask learners to point to 4 or 7 or a different number. Learners are likely to need to count along the track initially to identify the correct word, but this will improve over time.

- Ask learners what they could do if they wanted to use the word track to support counting objects. Elicit that zero is not needed, so it would be better folded behind 1 so that it does not affect the count.

After this activity, learners could try **Learner's Book Exercise 1.4 question 1** and **Workbook Exercise 1.4 questions 1 and 5**.

Answers: Word number track completed correctly.

› **Differentiation ideas:** To support learners who find this difficult, give them 1 to 10 number tracks. Discourage learners from also numbering their number word track. If numbered, learners will rely on the number rather than trying to learn the number word.

To challenge more confident learners, ask them to check their spelling and correct as necessary.

Plenary idea

Number word action (10 minutes)

Resources: Large number word cards.

Description:

- Ask the learners what kind of actions they could do just where they are. Agree a list such as clap, click fingers, tap nose or toes, stand up, jump up and so on, as appropriate.
- Ask a learner to choose an action, for example clap.
- Display a number word and say, 'Clap this many times. Ready, go!' or something similar.
- Count to confirm if learners correctly identified the number word.

> **Assessment ideas:** Learners will notice if someone claps fewer or more times than others. Clarify with questions such as 'Did you read that as 5? It is 4, f-o-u-r.' Display that number card later with a different action, observing if the same learners are beginning to read it correctly. Learners who struggle need more practice with the number words, perhaps through the Learner's Book or Workbook activities.

Are learners beginning to recognise the number words? It is unlikely that all learners will recall all of them, but they should improve with time. Reading the words is easier than writing them initially. Learners may choose to practise reading the number words independently using a set of
word cards or the materials they have prepared in sessions.

Guidance on selected Thinking and Working Mathematically questions

Learner's Book Exercise 1.4 Let's investigate

Learners will be using metacognitive behaviour as they plan, monitor and evaluate their investigation. They may go on to make changes to their behaviour as the investigation progresses. When learners sort the words into the relevant sets, learners are **specialising**, choosing and testing an example to see if it satisfies or does not satisfy the given specific mathematical criteria. Learners are also **classifying** as they create their sets.

Encourage learners to check what they have done. Learners could use one of their previously prepared resources for support. Look out for learners who get stuck. Ask them to explain what they have done so far. This will often be enough to clarify the learner's thinking and get them going again.

Draw learners together to ask what they found out. Do other learners agree or did they reach a different conclusion? Can pairs of learners who disagree **convince** the other pair that they are correct? This gives the opportunity for both **critiquing** and **improving**. Support learners to be gentle in their critiquing. We all make mistakes and get the wrong idea at times, but we can all improve.

> ### CROSS-CURRICULAR LINKS
>
> - Learners are likely to see number words in stories, on coins and banknotes or sometimes in instructions for other subjects.
> - Share stories that include number words. Ask the learners to read the words with you and eventually independently.
> - Learners should be well equipped to notice and read number words in a range of texts across the curriculum.

Homework ideas

1 Ask learners to look at coins and banknotes, exploring local currency and currency from English-speaking countries if available. Do they have words or numbers on them, or perhaps both? Learners could bring in any examples of local and foreign coins that they have.

2 Start a list of books with number words in. Invite learners to add the title of a relevant book they have read at home. Learners could also ask parents and carers to show them examples of number words in newspapers and magazines. When the newspaper or magazine is finished with, learners could bring it in to show the class or add to the class collection.

1.5 Odd and even numbers

Learning objectives	Learning intentions	Success criteria
1Nc.05	• Understand odd and even numbers as 'every other number' when counting, from zero to 10 and beyond.	Learners recognise odd and even numbers on a number track. They are aware that an even number of objects can be put into pairs with none left over but that an odd number of objects will always have one left over.

LANGUAGE SUPPORT

Learners may have heard the word *odd* used to describe something unusual so initially may be confused by its use here. Focus on establishing understanding of even numbers and then move on to odd numbers. Learners will already be familiar with *pair* and *pattern* but perhaps not in the more rigorous mathematical uses of the words. Model the correct use of the language yourself and regularly check understanding.

Even: a number that can be put into twos with none left over

Odd: one more or one fewer (less) than an even number

Pair: two things that go together

Pattern: regular arrangement, often repeated

Common misconceptions

Misconception	How to identify	How to overcome
Learners confuse odd and even numbers.	Ask learners to give you an odd (or even) number.	Focus on what the words 'odd' and 'even' mean. Ask learners to show you whether a number is odd or even with objects. Work on developing recognition of the pattern of odd and even numbers on the number track.

Starter idea

Pairs (10 minutes)

Resources: Slides showing a range of paired items such as socks, gloves and shoes or the actual objects. Ensure that some slides or physical examples have an odd one as well as complete pairs.

Description:

• Explore each of the slides or sets of objects one at a time.

• Count the objects. Encourage comments recognising pairs and noting when there is one left over.

• Ask learners how they could make any slides with an odd one into complete pairs. Accept having one more or putting one away.

• Revisit each slide, drawing up a simple chart of 'pair numbers' and 'one left over numbers'.

• Look at the numbers on a number track and discuss the pattern. The 'one left over' numbers start at 1 and then every other number has one left over. The pair numbers start at 2 and then every other number is a

pair number. Every number is either a pair number or a 'one left over' number.

- Explain that in mathematics, the pair numbers are called *even* and the 'one left over' numbers are called *odd* numbers and that during the next few lessons, the learners will be finding out all about odd and even numbers.

- Ensure learners link pairs with even numbers and one left over with odd numbers.

Main teaching idea

Odd and even cubes (40 minutes)

Learning intention: To explore odd and even numbers through making pairs with cubes.

Resources: Lots of connecting cubes and a set of cards from **Resource sheet 1D** for each pair.

Description: This activity is good for using manipulatives to understand a number idea.

- This activity works best if learners are sitting at tables or desks. Have plenty of cubes on each table as learners will eventually use 55 in their pair.

- Ask learners to work with a partner. Ask each pair to take a single cube and the number 1 card.

- Ask learners if 1 is odd or even. If necessary, ask if the cube is in a pair or on its own and remind learners that if a number of objects can be arranged in pairs with none left over, it is an even number. One cannot be arranged in a pair, so it is odd.

- Learners should place the cube on or next to the number card.

- Next, ask learners to take two cubes and join them together. Support learners to identify whether 2 is odd or even.

- Move on to three cubes. This time, learners can make one pair and have one cube left over, confirming that 3 is odd.

- Continue to 10. When learners have explored all numbers to 10, ask them to rearrange their number cards and cubes. Ask them to put together all the odd numbers on the left and all the even numbers on the right.

- Check that everyone has 1, 3, 5, 7 and 9 in their odd number set and 2, 4, 6, 8 and 10 in their even number set.

- Now tell the learners that one partner needs to count to 10 while the other calls out odd or even

for each number. This may be tricky to organise as a whole class, but it really reinforces the pattern of odd and even.

- Repeat, swapping learners. The whole class should hear: 1 odd, 2 even, 3 odd, 4 even, 5 odd, 6 even, 7 odd, 8 even, 9 odd, 10 even.

- Remind learners of the pattern they have said and ask them to tell you whether 0 is odd or even. The pattern shows that it is even, but it does not have any objects to put into pairs.

After this activity, learners could try **Learner's Book Exercise 1.5 question 1** and **Workbook Exercise 1.5 questions 1, 2, 3 and 4**.

Answers: Learners are beginning to recognise and recall which numbers from 0 to 10 are odd and which are even.

› **Differentiation ideas:** To support learners who find this difficult, pair them with a partner with whom they will work well. This may not be someone from their usual friendship group. You could consider setting up maths partners, pairs who always work together in mathematics. Maths partners need to be willing to listen to each other. Each partner must be able to ask the other to explain and both must be willing to support each other as necessary without taking over.

To challenge learners who find this straightforward, ask them to demonstrate the odd and even count to the class, then support others to join in.

Plenary idea

Are you an odd class? (10 minutes)

Resources: None.

Description:

- Ask the learners if they are an odd class or an even class. Accept the answers given and then ask how the learners could prove what they have said. For example, if the learners say there is an odd number of boys in the class, ask the boys to stand in pairs and check if a boy is left over. Make sure you do this on a day when all are present. You could also take a photograph of the boys in pairs for a display.

- Repeat for the girls and for the whole class. Explore other suggestions too. These might include features of the room – does it have an odd number of doors, windows or lights? Although the numbers involved are

likely to extend beyond 10, shift the focus to making pairs and whether or not there is one left over.

• Make a display with the relevant heading – 'We are an odd class!' Or 'We are an even class!' Or perhaps 'We are sometimes odd and sometimes even!', splitting the display into two parts.

> **Assessment ideas:** Although some learners may make incorrect suggestions, what matters is how these are proved. If, on pairing up the girls, there turns out to be an even number rather than an odd number, learners should accept their mistake and move on. Where both odd and even are suggested, showing which it is by pairing will clarify.

Are learners beginning to understand what is meant by an odd number and an even number? Do some learners need to return to pairing up cubes for the numbers 1 to 10 to remind themselves of what is meant by odd and even and the pattern of odd and even?

Guidance on selected Thinking and Working Mathematically questions

Learner's Book Exercise 1.5 Let's investigate

Learners could write a list of what they notice. It will be useful to remind learners that 10 is an even number.

1, 9. Odd, odd

2, 8. Even, even

3, 7. Odd, odd

4, 6. Even, even

5, 5. Odd, odd

As they explore, learners are noticing and trying to locate a pattern. They may not have looked at the ten frames in any order, but they should notice that two odd numbers put together make 10 and two even numbers put together make 10. They are both **specialising** and **generalising**. Many learners will want to find out if this is always true by swapping numbers around. When they do this, they are losing the crucial 'make 10' criterion. They will discover that they can put an odd and even number together, but they cannot make a complete ten frame this way. Learners need to explore this for themselves in order to convince themselves.

Those learners who used ten frames with the counters drawn on will benefit from using those sets. They will see the quantity directly as well as whether it is an odd or even number. Learners using the plain sets have recognised the odd and even properties of the shape created.

Challenge some learners by saying that two odd numbers together make an even number and two even numbers together make an even number. Learners could make a set of eight frames to explore this. Remember, learners have not yet explored addition, so should not be asked to record in a more formal way.

> **CROSS-CURRICULAR LINKS**
>
> • Numbers are everywhere. Often odd and even are used in some way but we rarely notice, for example book page numbers. Even numbers are usually on the left and odd numbers on the right. This is because we start numbering on the first page with 1 and then progress from there. Learners can check that this is true for all printed materials.
>
> • In science, learners often explore the characteristics of other creatures. When this involves the number of a particular feature, these are often even numbers. We have two eyes to give us a wide field of vision and two ears to ensure we can hear noises from all around us. Insects and other creatures have an even number of legs so they can walk straight. The same is true of wings. If legs and wings were not paired, it would be very difficult to control the direction of movement.
>
> • Many everyday objects have things in pairs – two wheels on a bicycle, four wheels on a car. Learners could look out for other examples across the curriculum.

Homework idea

Ask learners to collect examples of odd and even numbers of objects at home. Fold a piece of paper in half. Label one half odd and the other even. Learners could draw or write on each side. Bunk beds are a good example of an even number. Stovetops usually have four cooking rings on them, but not always. Give learners the opportunity to share what they noticed.

Assessment ideas

• You can use the 'Look what I can do!' feature to encourage learners to think about their learning and assess their own understanding of the concepts covered in each section. As a class, read through each statement and ask each learner to tick the column

that matches how they feel. Learners can tick the neutral face if they are not very confident about the statement. They can tick the happy face if they do feel confident about the statement. Make time to check learners' responses and plan appropriate interventions.

- The **Check your progress** exercise in the Learner's Book covers the main points in the unit, so you can identify areas that learners are struggling with.

⟩ **Digital Classroom:** At the end of the unit you can use the activity with the whole class. The i button will give you more information.

CAMBRIDGE
Primary Mathematics

Workbook 1

Cherri Moseley & Janet Rees
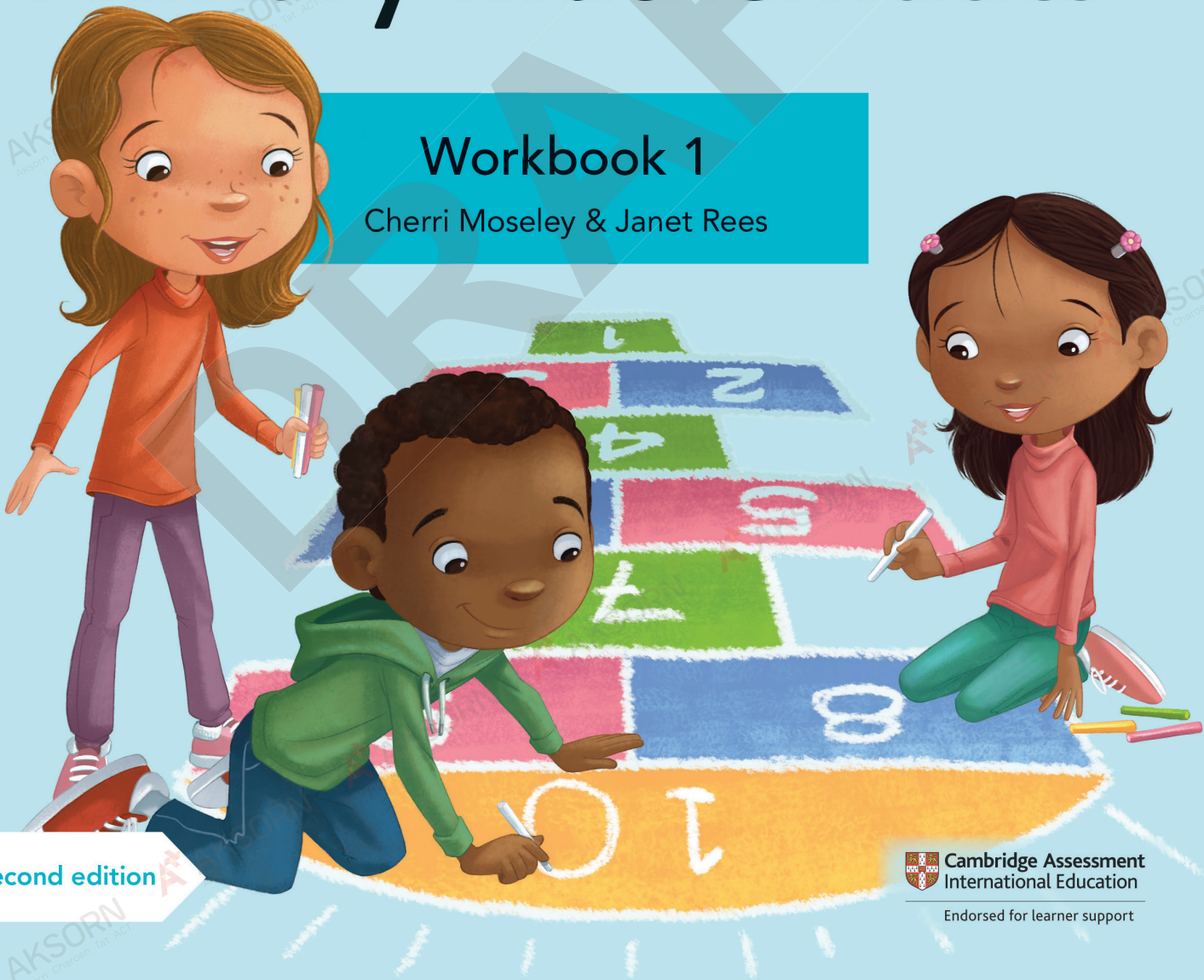
Second edition

Cambridge Assessment
International Education

Endorsed for learner support

Contents

1 ▸ Numbers to 10

❯ 1.1 Counting sets of objects

Exercise 1.1

| estimate | how many | row | set | total |

Focus

1 Count each set of animals.
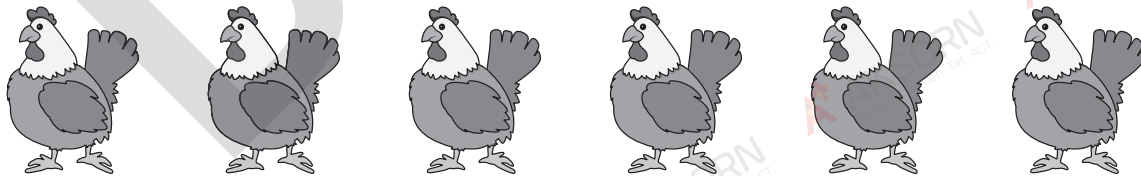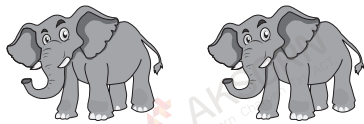
Talk to a partner or carer about how you counted each set of animals.

2   Put 1 object in each space.

Count them.

Put the same objects into different spaces. Count again.

Did you count to the same number each time?

3   Match each set to the correct number.
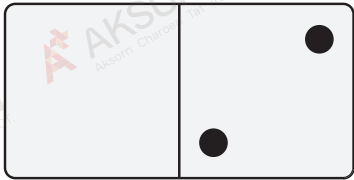
2
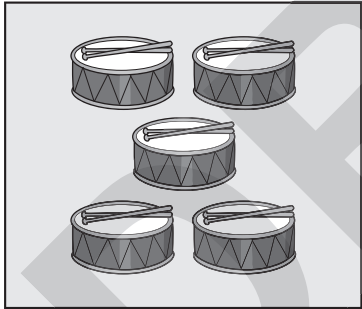
3
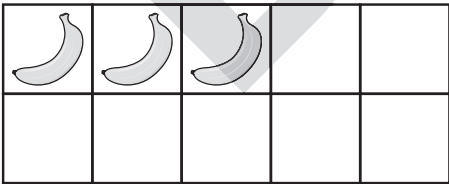
5

7
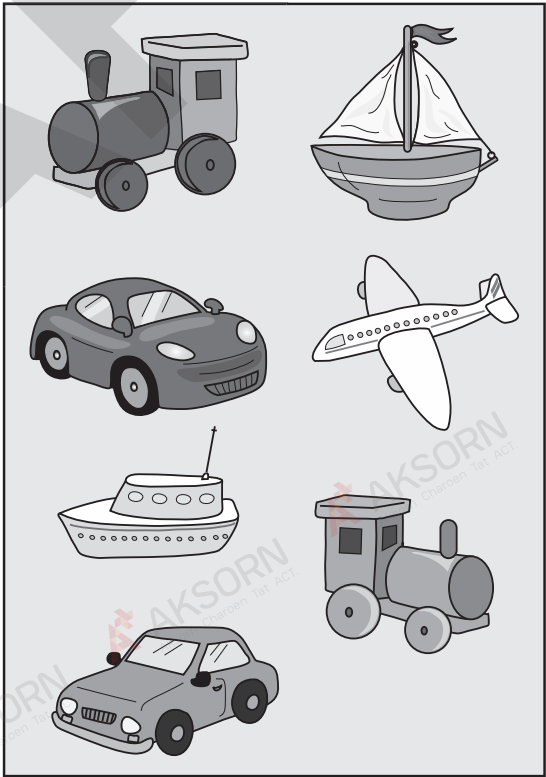
4 How many animals are there?

Estimate then count.
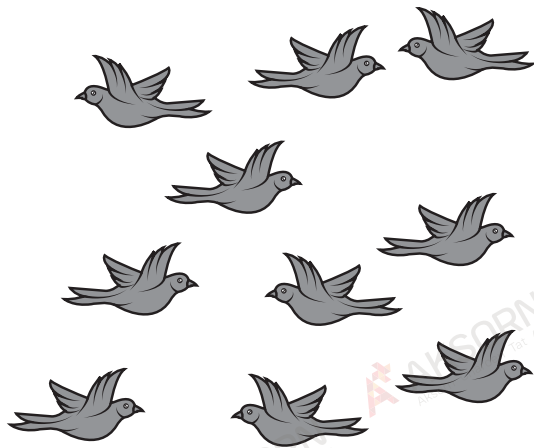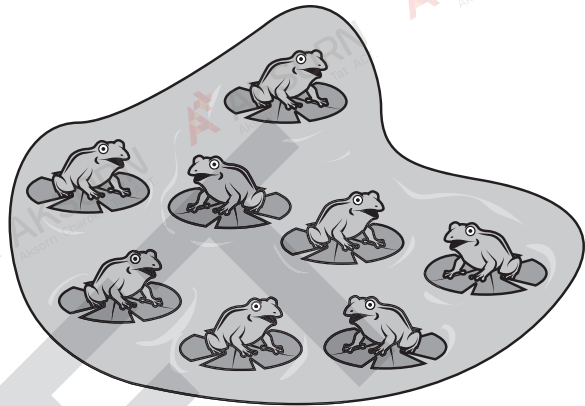
Estimate	Count	Estimate	Count

Practice

5 Draw the correct number of animals in the last two rows.

1	🐅								
2	🐒	🐒							
3	🐘	🐘	🐘						
4	🦛	🦛	🦛	🦛					
5	🐊	🐊	🐊	🐊	🐊				
6	🦁	🦁	🦁	🦁	🦁	🦁			
7	🦒	🦒	🦒	🦒	🦒	🦒	🦒		
8	🦜	🦜	🦜	🦜	🦜	🦜	🦜	🦜	
9	🐍								
10	🐜								

6   Put 1 object in each space.

Count them.

Put the same objects into different spaces. Count again.

Did you count to the same number each time?

7   Which domino has 7 spots?

Draw a ring around the correct domino.
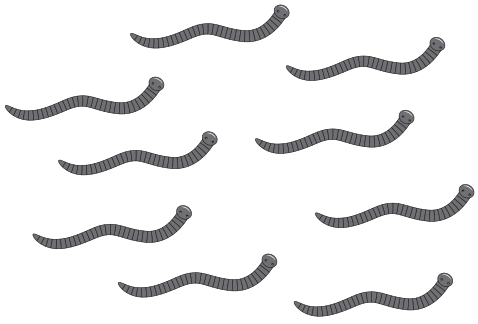
8   How many animals are there?

Estimate then count.

	Estimate	Count

	Estimate	Count

	Estimate	Count

Challenge

9 Here are the domino patterns for 6, 7, 8 and 9.
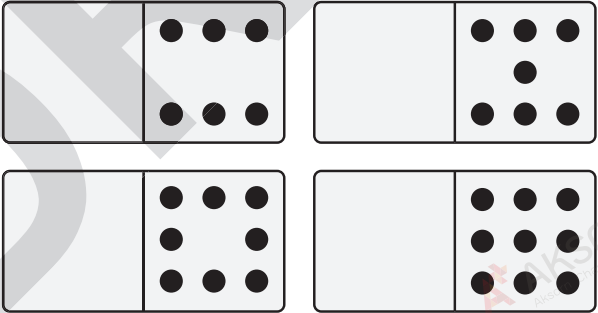
Design a domino pattern for 10.

Worked example 1

Look at each of the sets below.

7

I see a set of 3 and two sets of 2.

I see a set of 3 and a set of 4.
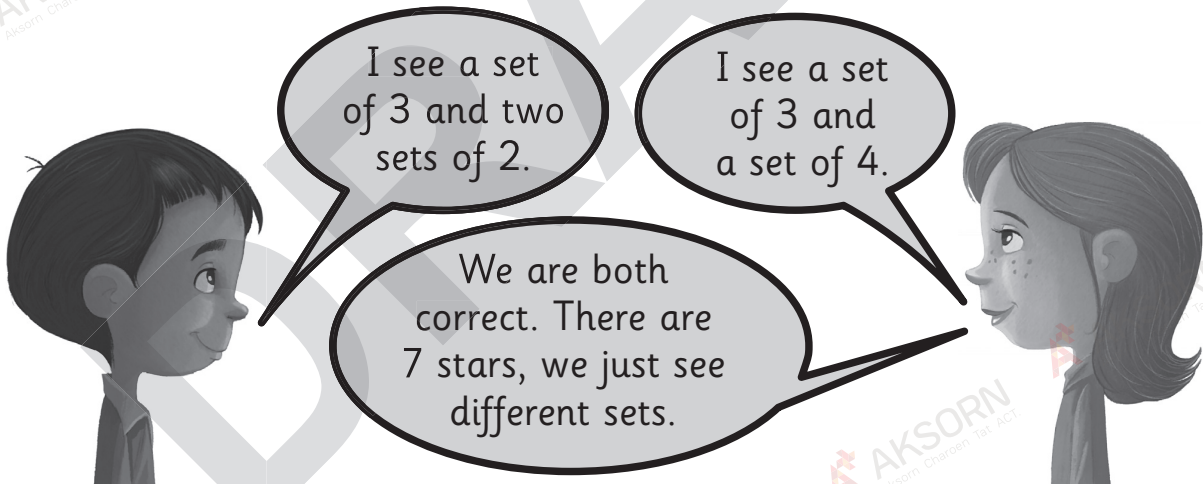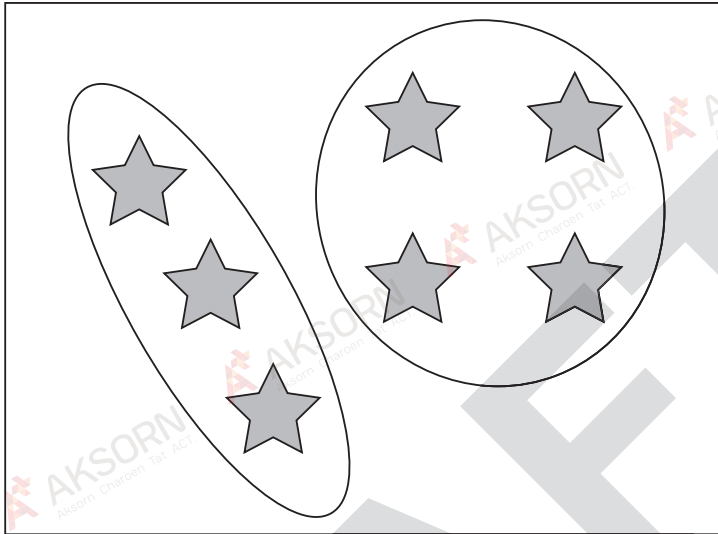
We are both correct. There are 7 stars, we just see different sets.

10 Look at each of the sets below.

Can you see smaller sets inside each set?

Draw a ring around the smaller sets you notice.
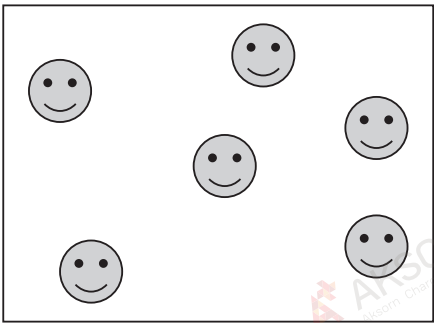
6
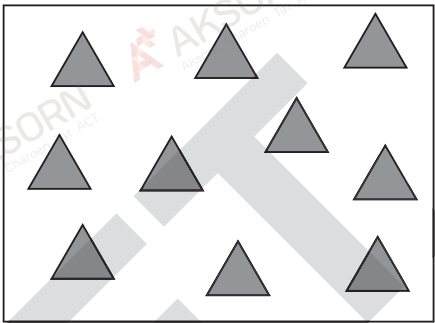
10
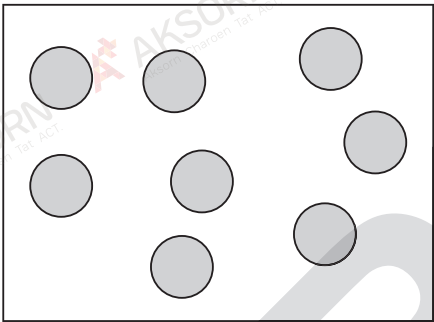
8

7
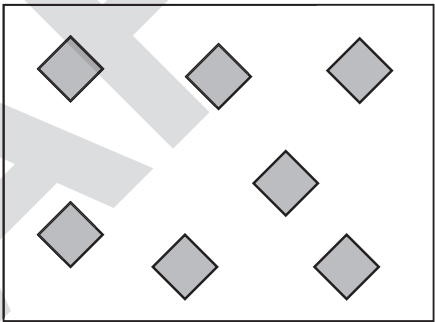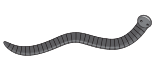
Talk to a partner or carer about what you see. Ask them what they see.

13

11 Estimate then count.

Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Count	Count	Count	Count	Count	Count	Count

❭ 1.2 Say, read and write numbers to 10

Exercise 1.2

after   before   between   count
next   number track   order   point

Focus

1 Say each number. Point to it on the number track.

Start here ⟶ Finish here

1	2	3	4	5	6	7	8	9	10

2 Colour the squares on this number track.

1	2	3	4	5	6	7	8	9	10

3 Write the missing numbers.

	2	3	4	5	6	7	8	9	

Talk to a partner or carer about how you found the missing numbers. What did they do?

15 ❭

Practice

4   Count to 10.

Write the missing numbers.

1		3		5		7		9	

	2		4		6		8		10

5   Where is the mistake in this number track?

1	2	3	4	5	6	8	9	10

Talk to a partner or carer about how you found the mistake. What did they do?

6   Write the number that comes after.

3	

5	

7	

9	

Challenge

7   What are the mistakes in this number track?

1	7	3	5	6	2	8	9	10

8   Write the number that comes before.

	4

	8

	10

	3

9   Write the missing numbers.

2		4

6		8

7		9

	3	

	7	

		10

Talk to a partner or carer about how you found the missing numbers.
Ask them what they did or would do.

17   〉

1.3 Comparing numbers

Exercise 1.3

> compare equal fewer more same

Focus

1 Compare the sets.

Tick ✓ the set that has fewer objects.

2 Compare the dominoes.

Tick ✓ the domino that has more spots.
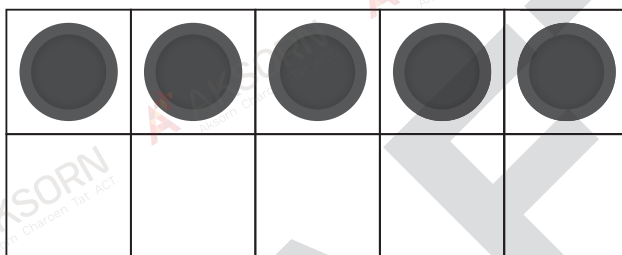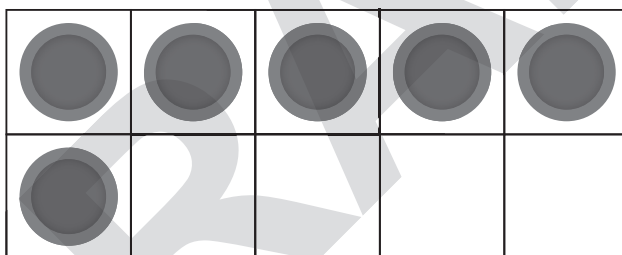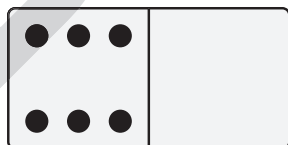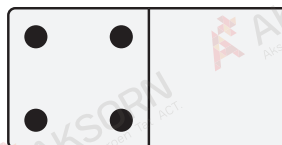
Talk to a partner **or carer about** how you know. What did they do?

3   Compare the sets.

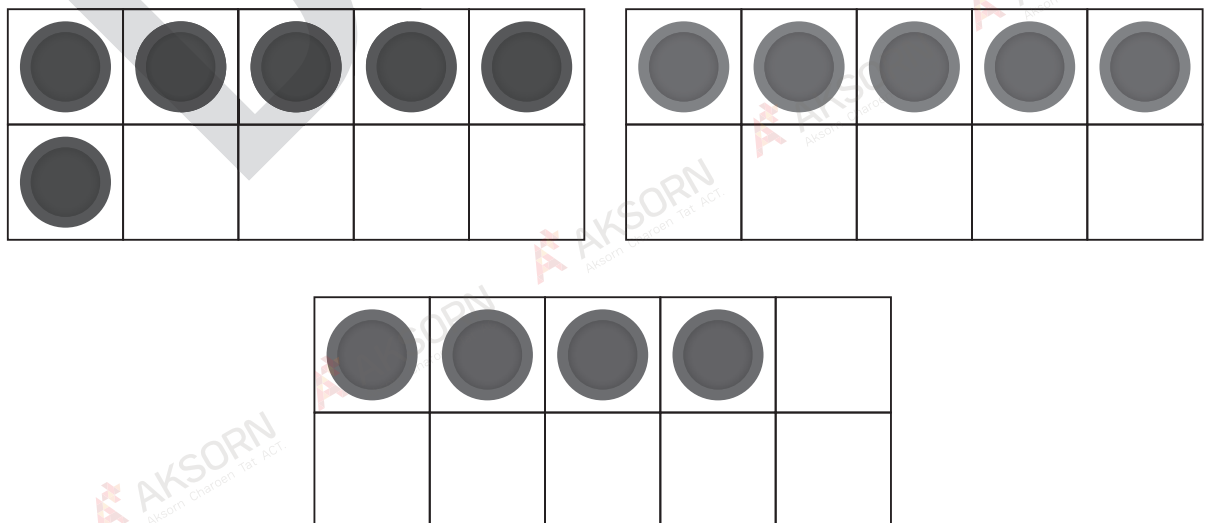Tick ✓ the sets that have the same number of objects.
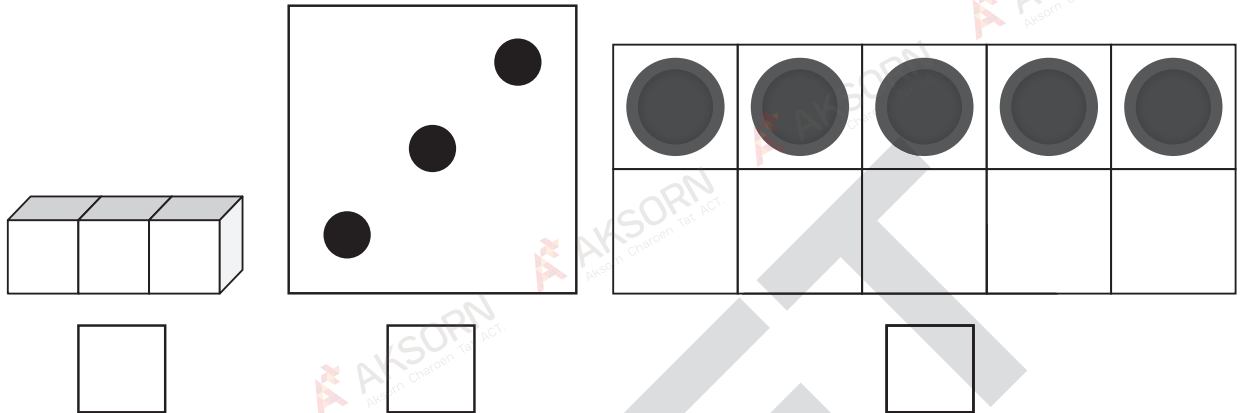
Practice

4   Compare the dominoes.
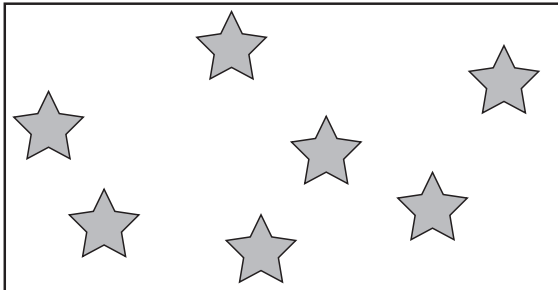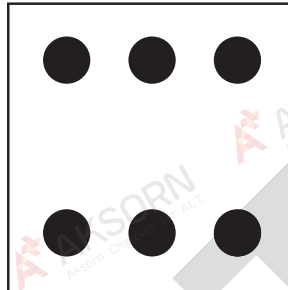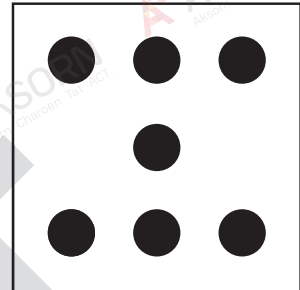
Draw a ring around the **domino** that has the **most** spots.
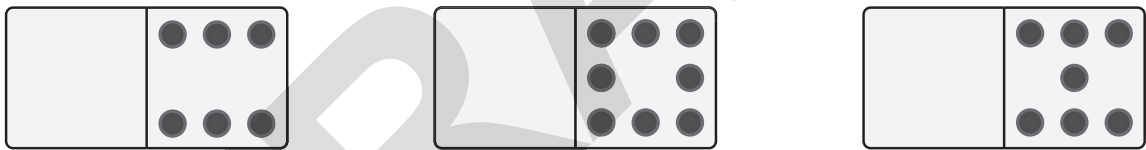
5   Compare the sets.

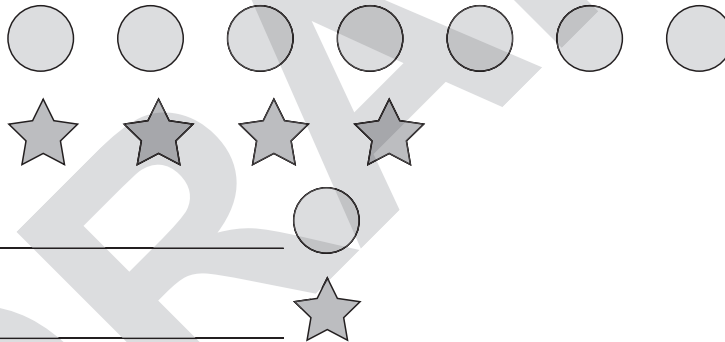Draw a ring around the set that has the **fewest** objects.

6 Compare the sets.

Tick ✓ the sets that have an equal number of objects.

7 Compare the sets.

Complete the sentences.

There are _____ ◯

There are _____ ★

There are more _____ than _____ so there

are fewer _____ than _____ .

8 Look at question 7.

How many more circles than stars?

How many fewer stars than circles?

9 Write a number that is greater than 9.
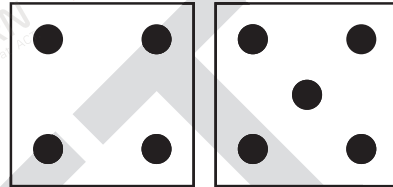
10 Write a number that is fewer than 7.

Talk to a partner or carer about how you answered questions 9 and 10.
What did they do?

Challenge

11 Compare the sets.

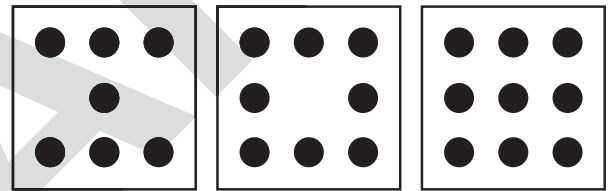Complete the sentences.

5 is more than 4.

_____ is fewer than

_____ .

12 Compare the sets.

Complete the sentences.

9 is more than 7 and 8.

_____ is fewer than

_____ and _____ .

13 Write a number that is more than 5 and fewer than 9.

Talk to a partner or carer about how you chose your
number. What did they do?

14 Complete the sentences comparing 3 and 5. Use more,
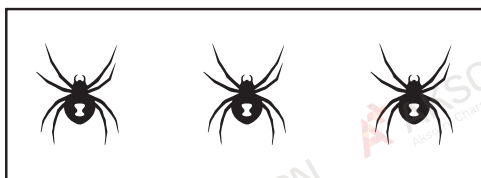fewer, less or greater.

3 is _____ than 5.

5 is _____ than 3.

_____

_____

21 〉

❯ 1.4 Number words

Exercise 1.4

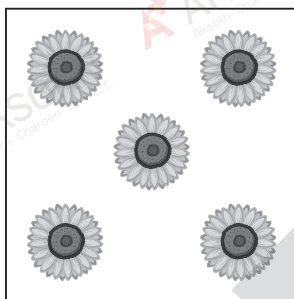| zero: 0   one: 1   two: 2   three: 3   four: 4   five: 5 |
| six: 6   seven: 7   eight: 8   nine: 9   ten: 10 |

Focus

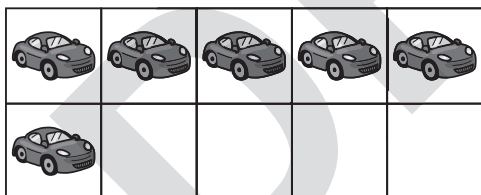1   Draw a ring around the number word that matches the set.

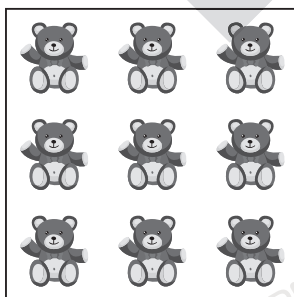| one | two | three |

| four | five | six |

| five | six | seven |

| eight | nine | ten |

2   We write 0, zero if there are no objects.

Draw a plate with zero biscuits on.

Practice

3   Write the missing number words.

1	2	3	4	5
	two		four	
6	7	8	9	10
six		eight		

4   Look at this picture for 9.

9	●●●●● ●●●●
●●● ●●● ●●●	nine

Draw a picture like this for 7.

5   Complete the number word track. Look at page 20 for the number word spellings.

zero	one							eight		

Challenge

6   Write the missing number words.

_____   _____
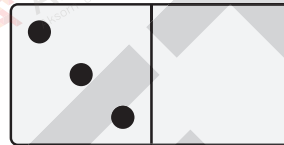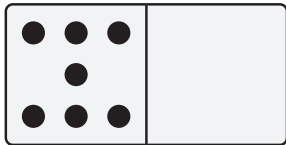
Talk to a partner or carer about how you found the missing words. What did they do?

7   Number word puzzles.

Complete the number words.

s		v		n

			o

		v	e

f			r

	w	

	n	

⟩ 1.5 Odd and even numbers

Exercise 1.5

even   odd   pair   pattern

Focus

1   Look at the gloves.

How many gloves are there?

Is that an odd or even number?   **odd / even**

How do you know?

_____

_____

2   Look at the socks.

How many socks are there?

Is that an odd or even number?

How do you know?   **odd / even**

_____

_____

Practice

3   Odd or even?

Draw a ring around the correct word.

4	5

odd / even   **odd / even**

6	7

odd / even   **odd / even**

Talk to a partner or carer about how you know if a number is odd or even

4   Draw a ring around the correct word in each sentence.

9 is an **odd / even** number.

10 is an **odd / even** number.

Use some cubes to check.

Were you correct?

87

5   Draw an odd number of socks on the ten frame.

Make it easy to see that there is an odd number of socks.

Challenge

6   How can you describe an odd number?

_____

_____

How can you describe an even number?

_____

_____

Are there **any numbers that** are odd *and* even?

Why?

_____

_____

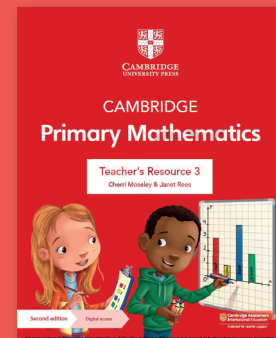7   Zero is an even number but you cannot put 0 cubes into twos.
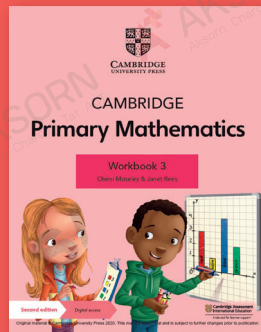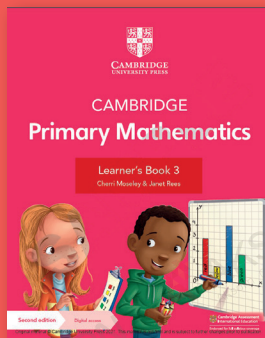
Why is 0 an even number?

_____

_____

27 〉

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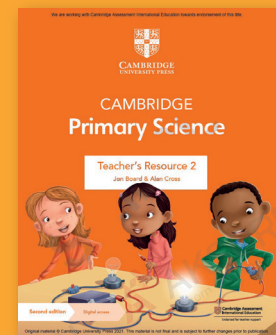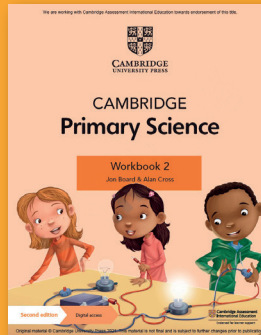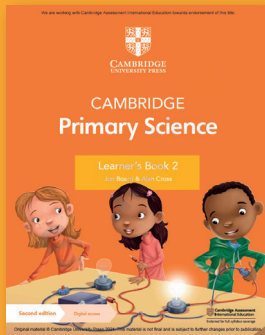
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▶ Focus on developing language, knowledge, and skills across English, Maths and Science
▶ More guidance and features to support assessment for learning
▶ Increased support in our teacher's resource
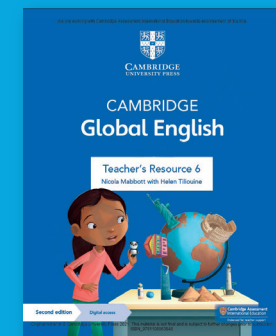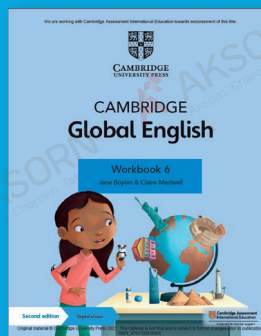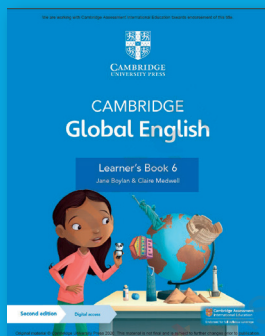▶ Downloadable digital editions for remote learning

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