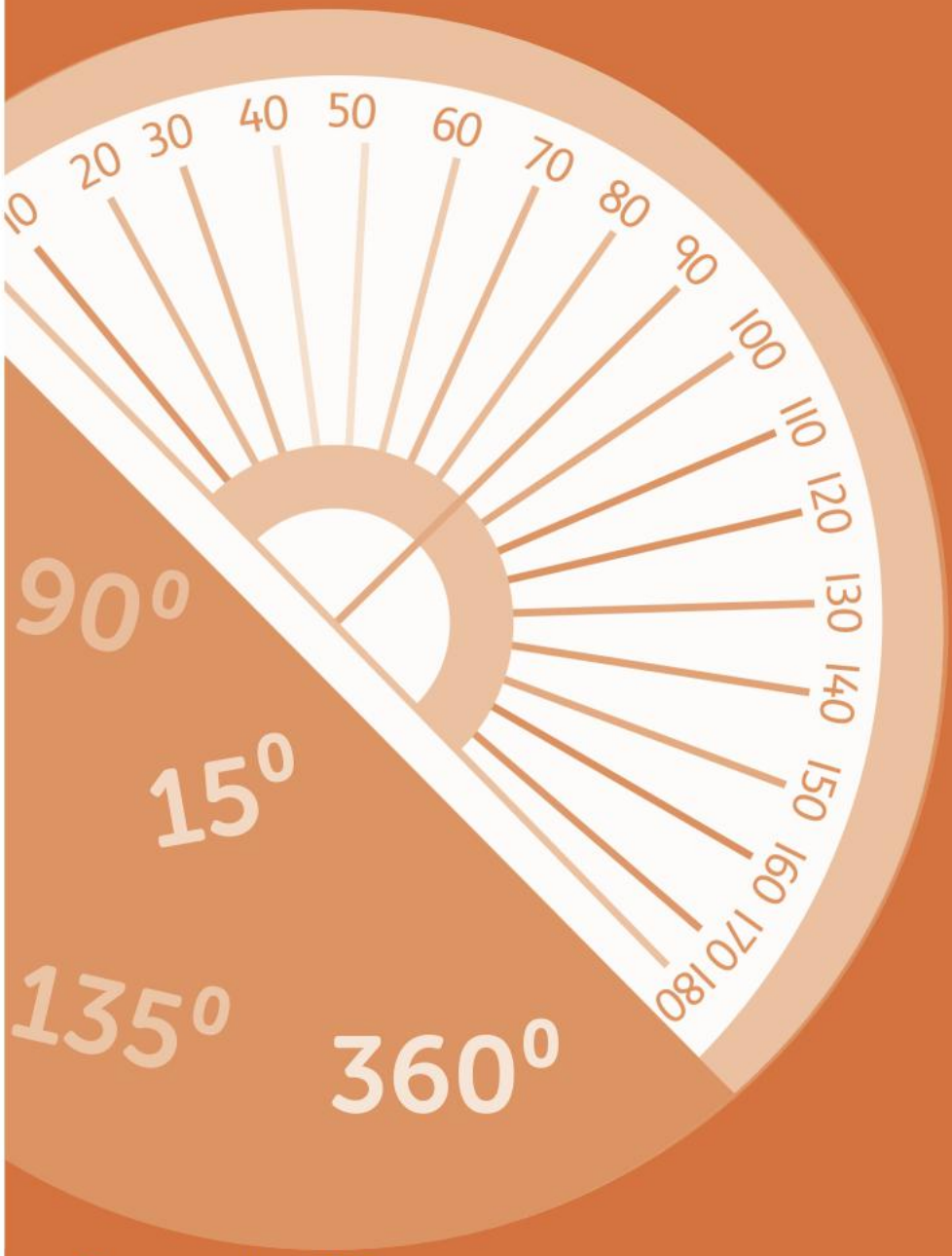
Oxford International Primary

5

Maths

Teacher's Guide



Second edition

OXFORD

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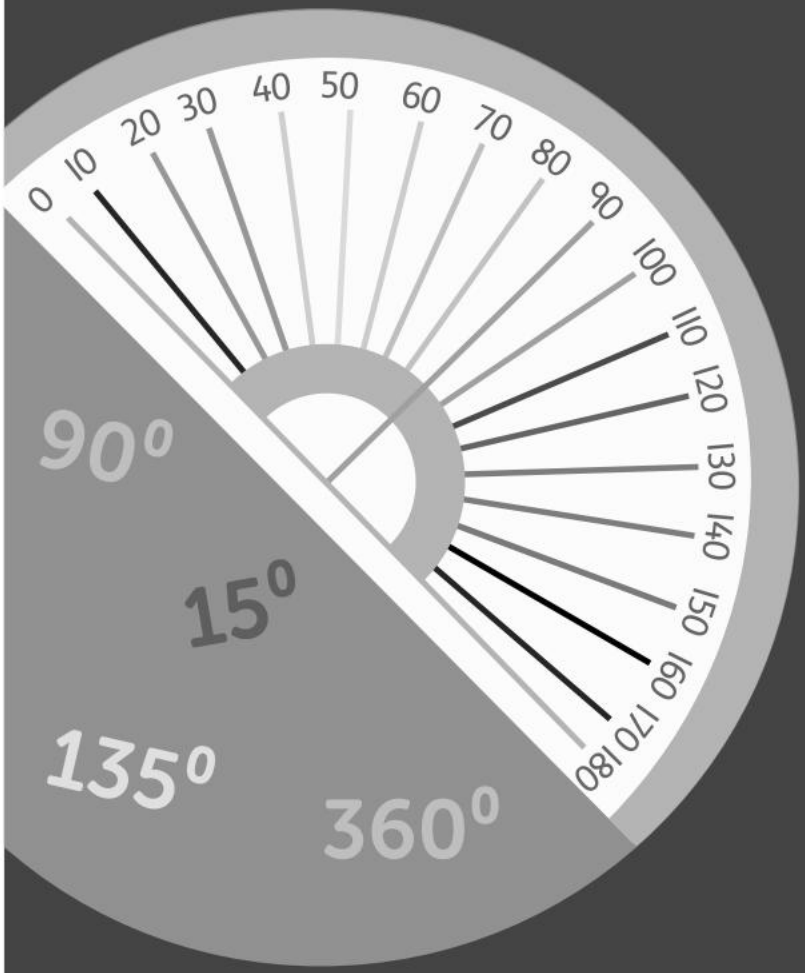

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Contents

Introduction

The joy of learning maths

We are living in an ever-changing world, where the way we work, live, learn, communicate and relate to one another is constantly shifting. In this climate, we need to instill in our learners the skills to equip them for every eventuality so they are able to overcome challenges, adapt to change and have the best chance of success. To do this, we need to evolve beyond traditional teaching approaches and foster an environment where students can start to build lifelong learning skills for success. Students need to learn how to learn, how to problem solve, be agile and work flexibly. Going hand-in-hand with this is the development of self-awareness and mindfulness through the promotion of wellbeing to ensure that students learn the socio-emotional skills to succeed.

With *Oxford International Primary Math*s, students develop lifelong learning skills as well as mathematical skills. The course promotes the development of real-world skills including financial literacy. The activities in the Student Books and Practice Books offer numerous opportunities to think creatively and develop interpersonal skills. Fundamentally, *Oxford International Primary Math*s promotes students' self-development as critical thinking and motivation are at the heart of the problem-solving approach in the course.

This series is based on the English National Curriculum Programme of Study for Primary Maths. The *Oxford International Primary Maths* books for each stage meet all the learning objectives from the curriculum. Each lesson includes the learning objectives and a summary of the key teaching points. A full mapping grid identifying the unit and lesson where each objective can be found is available online at www.oxfordowl.co.uk

Oxford International Primary Maths: A problem-solving approach

In this second edition of *Oxford International Primary Maths*, there is a strong focus on using a problem-solving approach. While mathematical facts are important, it is unlikely that simply giving students the information they need will result in them understanding the mathematics and being able to apply their learning in new problem-solving situations. This is often described as a move from 'surface learning' to 'deep learning'.

Many people remember mathematics lessons as places where the teacher stood at the front of the class writing on the board. Students wrote down the information, maybe worked through a couple of examples with the teacher and then proceeded to complete a series of exercises to practise the skill that they had been taught. This can be described as a *didactic* approach and it relies on the idea that direct instruction is the appropriate strategy to adopt. The authors of this series would argue that *heuristic* strategies encourage students to explore the mathematics for themselves supported by the teacher. 'Heuristic' derives from the Greek word meaning to discover, and in mathematics learning, heuristic strategies are ones where students engage in exploration and discovery to solve a problem. Heuristic strategies include making a visual representation of a problem, making a calculated guess or estimate, simplifying a problem or following a known method. This results in a deeper understanding.

When faced with any problem in mathematics, there are recognised stages to go through in order to solve the problem, and these have been developed and agreed by many researchers. One version that summaries the problem-solving process comes from Georg Polya.

1. Understand the problem.

2. Devise a plan.

3. Carry out the plan.

4. Check the reasoning.

In following these stages, students use a number of skills that support problem solving, such as using trial and improvement, working systematically, pattern spotting, visualising, conjecturing and generalising.

Embedding a mastery approach

In recent years, the term 'mastery' has been used in conjunction with mathematics learning. It has been drawn from teaching approaches in countries where mathematics performance is deemed to be very high. The essence of mastery is to produce students who have deep conceptual understanding and procedural fluency through learning in a collaborative and problem-solving context. Mastery learning incorporates use of manipulatives, exposure to different methods of solving a problem, dialogue and explanation.

Following a Concrete Pictorial Abstract (CPA) approach

One of the more successful approaches to learning was provided by Jerome Bruner in his model of enactive, iconic and symbolic modes. This has been developed in recent years to form the CPA approach. CPA stands for concrete, pictorial and abstract, each of which aligns with Bruner's modes. The concrete phase involves students making use of physical manipulatives to help understand the learning, before moving to record the learning in pictorial form as individuals. As the learning develops, students will begin to recognise how to record their learning in a more general and abstract way. The CPA approach is not necessarily sequential, and students might move between the different modes as they work through a problem.

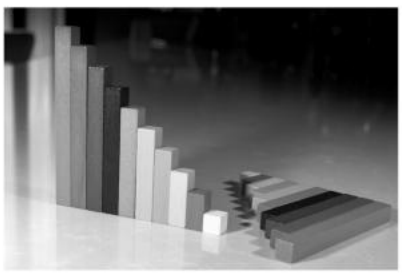
Oxford International Primary Maths and the use of manipulatives

Throughout the series, students are encouraged to use manipulatives, or concrete objects, to model addition, subtraction, multiplication and division. These manipulatives include:

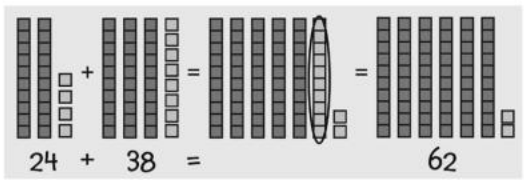
- base-ten equipment (ones-cubes, tens-rods, hundreds-flats and thousands-cubes)

- place-value counters

- number rods.



Such manipulatives are used to explain to students how the written methods 'work', for example by modelling exchanging 10 ones-cubes for 1 tens-rod in an addition.



Differentiation

There are several ways that you can differentiate learning in the classroom. These include differentiation by:

- task
- outcome
- support
- grouping.

It has been traditional in some schools to offer up to three different levels of tasks for each lesson. This is differentiation by task. It is important that all students are exploring the same area of mathematics as they can collaborate and discuss their mathematics in a way that is not possible if students are engaged on different activities. This approach has been extensively researched and published by Jo Boaler of Stanford University, California. For example, she has outlined projects that gave students in different schools either a differentiated approach in lessons, or lessons where everyone worked on the same task (Boaler, J., 2005. *The Elephant in the Classroom.* Souvenir Press). Where all abilities worked on the same task, every student made and sustained 'better than expected' progress, and performed better on statutory tests and exams. The Education Endowment Foundation teacher's toolkit suggests that collaborative learning can result in a five-month acceleration in students' learning. (See https://educationendowmentfoundation.org.uk/resources/teaching-learning-toolkit.)

The expectation in this series is that all students will be offered the same starting point. The activities are carefully designed to be accessible to all students in your class and the teacher's notes for the activity offer differentiated outcomes for students. It is also important that you offer differentiated support to different students. You will mainly do this through the sort of questioning that you engage in and support you offer. You will ask challenging questions and supporting questions to help all students access the task. For example, when engaging in a simple counting activity with some students you might model the action of counting by placing a finger on each object as you count and emphasise the last number you say to model that the last number you say gives the number of objects in the set. You might ask other students engaged in the same activity to compare two sets, or to find one more or one less than the set they are counting.

Grouping students to promote a growth mindset

When engaging in learning mathematics, it is expected that you will use a variety of student groupings. This may be a change for some teachers who have previously grouped students by prior attainment in their classroom. Research has shown that grouping students 'by ability', which usually means grouping students using test results, can have a negative impact on their future attainment. It is more effective to use a range of ways of grouping students. You will decide on the most appropriate way of grouping depending on the activity. You are also given advice in the teacher's notes.
It is important that the teacher is active in deciding which form of grouping is appropriate. It is also important that students learn how to operate in a range of different groups and with a range of different students so that they get used to working in a variety of ways and with different people.

The three main ways of grouping students are based on:

- friendship
- ability/prior experience
- mixed attainment.

Friendship groups, are most appropriate for activities in which the students have been given some element of choice. Perhaps they are carrying out some research for a data handling project or exploring data on animals to develop their understanding of measurement. This grouping is the default if teachers do not actively group students.

Ability groups, or groups based on students' prior experience, may be helpful if the lesson requires a very specific prior knowledge. You can group together the students you know have this knowledge and they can then work with minimal guidance from you, which allows you to focus on groups who need additional support.

Mixed-attainment groups are encouraged for the majority of the activities. This form of grouping is also favoured by those following a mastery approach. Working in collaborative, all-attainment groups also supports students' wellbeing and promotes a growth mindset, as described in research by Carol Dweck. She found that students who were grouped by ability tended to stay in those groupings throughout their school life, and regard themselves as having a fixed ability that could not be changed. This has dire consequences for students in middle or lower sets. When placed in mixed-ability groups, all students can develop a growth mindset which enables them to believe they can learn and improve, whatever their starting point (Dweck, C., 2007. 'The Perils and Promise of Praise'. *Educational Leadership.* October 2007, 65(2), 34–39). A growth mindset is promoted when students do not feel that their future success is predicated on prior achievement. This kind of grouping is particularly helpful for students new to English. Mixed-attainment groups allow students who are less confident in English to hear more-confident peers using mathematical vocabulary. Research has shown that mixed-attainment groups benefit both high attainers, who become more secure in their mathematics knowledge through explaining their thinking to peers, and those less secure in their mathematical knowledge as peer teaching has been shown to be effective.

Whatever form of grouping you choose, it is helpful to assign roles to individuals in the group. Some teachers use 'role cards' to remind members of the group of the role they should play. Here are some examples of roles.

- Leader: You should make sure everyone has a chance to speak and focus the discussion around the task.
- Time keeper: You should encourage the group to stay on task. Announce when the time is half way through and when time is nearly up.
- Recorder: You should write down group members' ideas or draw a collective graphic. You will write on the board during the presentation.
- Presenter: You will present the group's findings to the whole class at the end of the session.
- Resource organiser: You will make sure that group members have all the resources they need during the task.

Assessment

Assessment is the process of establishing how individual students are progressing and what they have achieved, or a means of measuring their learning. Assessment is usually carried out in two main ways – assessment of learning and assessment for learning.

Assessment of learning is sometimes called summative assessment, and takes place at the end of a lesson, a unit, a term or even a year. It measures what students know at that point as a summary of their learning to that point. In *Oxford International Primary Maths*, summative assessment opportunities are provided in the Review lesson at the end of each unit in the Student Book, while half-termly summative assessment opportunities are provided through printable resources, available online.

Assessment for learning is an approach brought to prominence by Paul Black and Dylan Wiliam and is based on the notion that students have a full, clear sense of what they are learning, where they have reached in their learning and what they need to do to improve further. It is carried out during lessons and gives teachers continuous data on each student's learning, as well as allowing students to track their own learning, which provides greater motivation. (Black, P., Harrison, C., Lee, C., Marshall, B., and Wiliam, D. 2004. 'Inside the Black Box: Assessment for Learning in the Classroom'. *Phi Delta Kappan.* (86)1, 8–21.)

It is suggested that there are five key strategies for assessment for learning. These are outlined below with suggestions of how you can do this in your classroom.

1 Being clear about learning objectives and success criteria with the students.

Each activity has at least one learning objective. At the beginning of a lesson, share the activity's learning objective with students. This should be more than simply stating the objective. You should make sure that students understand the objective and how you will measure success. For example, you might say: *I know that you can all count 10 objects* and all count to 10 as a class. Then you point to 20 on a number line and ask: *Does anyone know what this number is?* If a student knows it is 20 praise them, if no-one knows, tell them it is 20 and say: *By the end of the lesson I will be able to listen to you count to 20.*

2 Planning student discussions that give you evidence of their learning.

Every activity plan in the Teacher's Guide offers the opportunity for small-group or whole-class discussion. There are also examples of probing questions that you can ask to assess students' current understanding. For example, if a group has been counting two sets of objects you can ask: *Were there more or less in the second group? How do you know?*

3 Giving students feedback that helps them move forward.

This allows students to know whether or not they are meeting the success criteria and what they can do next to move their learning on. Developing the example above, if a group has been comparing two sets and understands the concept of 'more' and 'less' you could ask them to make sets that are one more and one less, or even two more and two less.

4 Activating students to act as instructional resources for each other.

Collaborative group work in mixed-attainment groups, as described by Jo Boaler in her research (see under Differentiation earlier), gives students the opportunity to operate both as learners and teachers, with peer learning being highly effective. Not only is understanding of the mathematics enhanced, but students can support each other in assessing their progress.

5 Activating students as owners of their own learning.

The key point here is to listen carefully to the students and adapt your questioning to support individual development and to follow individual interests.

Questioning is key

The most skilled mathematics teachers can ask open questions to elicit students' current understandings. Skilful open questioning also allows students to articulate their current understanding carefully and though this process either consolidate their understanding or come to realise where they have made a mistake. The list below offers a series of open questions that can be used whatever mathematics you are teaching.

- *How are these the same/different?*
- *About how many/how long/many more … do you think there will be?*
- *What would happen if …?*
- *How else could you have done that?*
- *Why did you …?*
- *How did you …?*
- *How do you know that is correct?*

If you want students to check their solutions and consolidate their learning it is helpful to ask them to explain how they reached their solution to a friend. Similarly, to support students in reflecting on their learning you might ask the following.

- *What mathematics did you use to solve the problem?*
- *What new mathematics did you learn?*
- *What key words did you use?*
- *What was the most challenging part of the activity?*
- *What did you do when you got stuck?*
- *What other questions could you ask?*
- *Did this remind you of any other areas of mathematics?*

In *Oxford International Primary Maths*, there is an opportunity to ask these reflective questions, and for students to reflect on their learning, at the end of each unit in the Review lesson of the Practice Book.

Word problems

Word problems are useful as an assessment of children's understanding of the correct mathematics to use in any given situation. In *Oxford International Primary Maths* word problems are included throughout the units and on every Student Book Review page as part of the end-of-unit assessment. Many teachers find teaching word problems a challenge. This area is particularly challenging for students with a limited English vocabulary as word problems are tightly bound to linguistic ability. We have to decode and understand what the problem is asking us to do before we can begin to apply our mathematical knowledge. Some teachers have found the following acronym helpful when working with students on solving word problems.

R: Read the problem carefully.

U: Understand what the problem is asking you to do.

C: Choose the mathematics or arithmetical operations that you need to use to solve the problem.

S: Solve the problem.

A: Answer the problem.

C: Check that the answer is accurate and reasonable.

It is often helpful for students to underline key facts and write down the operations they are going to use before they solve the problem. For example:

> Tony rode his bicycle 7 miles to school with his friend. On his way home he took a short cut which was only 5 miles. How far did he cycle altogether?
>
> *This will be an addition calculation.*

It is a useful activity for students to annotate word problems and write down the operation(s) they will use without carrying out the calculation as this focuses on the skill of understanding the problem and choosing the operations appropriately.

Another activity that helps students to become skilled at solving word problems is asking them to write their own word problems based on a picture or a set of objects. Here is an example.

- How many black cubes are there? (3)
- Two friends took three cubes each. How many were left? (2)
- If I take out the black cubes, how many are left? (5)
- If I share the cubes equally between two people, how many do they each get? (4)

Wellbeing and *Oxford International Primary Maths*

It is thought that students learn more and feel more connected to their learning when they are active in their lessons. *Oxford International Primary Maths* has active learning at its heart. Most lessons start with a whole-class session that usually includes a range of physical or active

activites. You will see this signified by a 'star-jump' icon in the Teacher's Guide.

Many adults and children have felt anxious about their learning of mathematics at some stage. This anxiety is reduced by working collaboratively in all-attainment groups. There is also a reflective session at the end of each lesson and the formative assessment activity in the Practice Book asks students to reflect on their learning across the unit.

Wellbeing is also supported by effective questioning to support and stretch students and by planning group work carefully. These areas have already been discussed above.

Language support

The challenges

Ministries of Education at both local and national level are increasingly adopting the policy of English Medium Instruction (EMI), for either one or two subjects or across the whole curriculum. The rationale for doing so varies according to the local context, but improving the levels of achievement in English is an important factor.

In international schools an additional reason is likely to be that students do not share a mother tongue with each other or perhaps the teacher. English is, therefore, chosen as the medium for instruction so that all students are in the same position and to provide the opportunity to develop proficiency in an international language.

This does not mean that the mathematics teacher is now being asked to replace the English teacher, or to have the same skills or knowledge of English (though in many primary schools one teacher may indeed teach both). What it does mean, however, is that mathematics teachers have to view their role differently: they have to become much more language aware. It is this recognition of the need to ensure that the delivery of the content is not negatively impacted by the use of the second language that informs the planning and methodology of EMI.

This raises significant challenges, including:

- the teacher's knowledge of English
- students' level of English (which may vary considerably in international schools)
- resources that provide appropriate language support
- assessment tools which ensure that it is the content and not the language that is being tested
- differentiation that acknowledges different levels of proficiency in both language and content.

Meeting the challenges positively

Perhaps lack of confidence in their own English proficiency is one of the most common concerns among teachers. However, while it is a factor, success in EMI is not necessarily linked to teachers' proficiency in English. Teachers who have English as their mother tongue may well lack the sensitivity to, or awareness of, the language that a non-native speaker has acquired through learning and studying the second language. Developing this awareness and demonstrating it in both materials and method is the key to effective EMI.

Classroom language/Teacher Talk

Often non-native-speaker teachers are more concerned about their ability to run and manage the whole class in English than they are about the teaching of the mathematics concepts, as the resources or textbook should help them with the latter. However, this use of English in the class is very important as it provides exposure to the second language, which plays a valuable role in language acquisition. It is also true that the Teacher Talk for purposes such as checking attendance and collecting homework does not have to be totally accurate or accessible to students. When teaching the mathematics concepts, however, it is essential that the Teacher Talk is comprehensible. Some basic strategies to ensure this include:

- simplify your language
- use short, simple sentences and project your voice
- paraphrase (say in a different way) as necessary
- use visuals, write or draw on the board, gestures and body language to clarify meaning
- repeat as necessary
- plan before the lesson
- prepare clear, simple instructions and check understanding.

Creating a language-rich environment

Primary teachers often excel at providing a colourful and engaging physical environment for students. In the EMI classroom, this becomes even more important. Posters, 'word walls', lists of key structures, students' work, English signs and notices all provide a backdrop that provides the opportunity for language exposure and language acquisition.

Planning

When planning, look carefully at each stage of the unit and identify the language demands. This means thinking about what language students will need to understand or produce, and deciding how best to scaffold the learning to ensure that language does not become an obstacle to understanding the concept. This involves providing language support and goes beyond the familiar strategy of identifying key vocabulary.

Support for listening and reading

Listening and reading are receptive skills, requiring understanding rather than production of language. If you are asking students to listen to or read texts in English, ask yourself the following questions when you are planning the unit.

- Do I need to teach any vocabulary before they listen/read?
- How can I prepare them for the content of the text so that they are not listening 'cold'?

- Can I provide visual support to help them understand the key content?
- How many times should I ask them to read/listen?
- What simple question can I set before they listen/read for the first time to focus their attention?
- How can I check more detailed understanding of the text? Can I use a graphic organiser (e.g. tables, charts and diagrams) or gap-fill task to reduce the language demands?
- Do I need to differentiate the task for those students who find reading/listening difficult?
- Could I make the tasks interactive (e.g. jigsaw reading, when students access different information before coming together then share information)?
- How am I going to check their answers and give feedback?

Support for speaking and writing

Speaking and writing are productive skills because students doing these need to produce language. They are different from the receptive skills of listening and reading where students receive language from other sources. These skills may require more input from the teacher.

When you plan to use a task that requires students to *produce* English (speak or write), you need to think about how to help them do this.

This means that you have to think in detail about what language the task requires (Language Demands, LD) and what strategies you will use to help them use English to perform the task (Language Support, LS).

You need to ask yourself the following questions.

- What *vocabulary* does the task require? (LD)
- Do I need to teach this before they start? How? (LS)
- What *phrases/sentences* will they need? Think about the language for learning mathematics (e.g. predicting and comparing). What structures do they need for these language functions? (LD)
- Will they be able to produce these sentences or should I provide some *scaffolding* [e.g. sentence starters/sentence frames/gapped sentences (see below)]? (LS)

  A square has ____ sides.

  A triangle has ____ sides.

  A quadrilateral has ____ sides.

  A pentagon has ____ sides.
- While I am *monitoring* this task is there any way I can provide further support for their use of English (especially for the less-confident students)? (LS)
- What language will students need to use at the *feedback* stage (e.g. when they present their task)? Do I need to scaffold this? (LD, LS)

Teaching vocabulary and structures

Vocabulary

Learning the key mathematics vocabulary is central to EMI and 'learning' means more than simply understanding the meaning. Knowing a word also involves being able to *pronounce* it accurately and *use* it appropriately. Below is a list of strategies that could be useful.

- Avoid writing the list of vocabulary on the board at the start of the unit and 'explaining' it. The vocabulary should be introduced as and when it arises. Word boxes are provided on each page of the Student Books and Practice Books with the key words for the lesson. This helps students associate the word or phrase with the concept and context.
- Before the lesson, check that you are confident with the pronunciation and spelling of the vocabulary that will be used. Write the vocabulary clearly on the board when you first introduce it in the lesson. If you think students may struggle to pronounce words, decide how best to model the pronunciation.
- Give students a chance to say a word once they have understood it. The most efficient way to do this is through repetition drilling.
- Use visuals whenever possible to reinforce students' understanding of the word.
- Ensure that students are recording the vocabulary systematically in their glossaries at the back of their Student Books, and, if possible, use a word wall that lists the vocabulary under unit or topic headings.
- Remember to use and revise the vocabulary.

Structures

In order for students to talk or write about their mathematics, they will need to go beyond vocabulary: they will also need to use those phrases and sentence frames that a particular task requires.

For example, they may need the following expressions in mathematics.

X is the same as Y.

The sides are the same length.

The next number in the sequence.

I predict that X will happen.

If X happens, then Y happens.

The next step is …

You need to build up banks of common mathematics phrases and encourage students to record them. This is an important part of identifying the language demands and providing the necessary support. You do not have to focus on grammar as the language can be taught as phrases rather than specific grammatical structures.

Using this Teacher's Guide

Every unit of the Teacher's Guide begins with useful background information that includes the following.

The Big idea: The main mathematical concept covered in the unit is outlined.

Look out for: This section focuses on tricky concepts that may need explaining prior to any learning taking place.

Common misconceptions: Common errors that students make, or misunderstandings that students have, are identified. This section offers advice on how to deal with these misconceptions.

Key vocabulary: This is a list of the key mathematical words used in the unit.

Coverage in lessons: The English National Curriculum objectives covered in the unit are listed.

Every lesson in the Student Book and Practice Book has corresponding lesson notes in the Teacher's Guide. These comprehensive lesson notes include the following.

A mini reproduction: This shows the relevant pages from the Student Book.

Global skills: These are the skills that aim to foster a classroom environment where students develop the skills for success. The skills are: *creative skills* where students are problem solving, investigating or exploring new maths content; *real-world skills* where students are taking part in research, or presenting and interpreting information, or if they are dealing with money and developing their financial literacy; *interpersonal skills* where students are practising their teamwork and communication, often through working in pairs or larger groups; and *self-development skills* where students have the opportunity to reflect on their learning and talk about what went well and what they are still uncertain about.

The key vocabulary and resources: Key vocabulary used in the lesson, and the concrete resources required for the activity, are listed.

Language support: This includes a range of strategies, including card sorts and card games, word walls, team games to define or explain words, use of similar words to explain meaning and exploration of the origins of words.

The key principles underpinning the language support are listed below.

Words should be introduced and explained carefully.

Words should be explained in context.

Repetition is vital.

Words should be linked to pictures or actions.

Students should develop their own glossaries.

The learning of mathematics vocabulary should be fun.

Language should not be a barrier to effective learning of mathematics.

Detailed lesson notes: Comprehensive lesson notes include an introduction activity and main activity. These notes refer to the Student Book and Practice Book, where relevant. The notes include probing questions for formative assessment, which are italicised. Icons are used to suggest the groupings that should be used at each point of the activity (whole class, small group, pairs, individual). A separate 'star-jump' icon indicates that the activities give students an opportunity for physical movement (standing up, jumping, moving around) rather than doing activities sitting down.

Differentiation: The Teacher's Guide offers strategies for you to *support* those students who may have difficulty accessing the task; to *consolidate* the learning for those students who need a little more practice; and to *extend* the learning for those who need more challenge.

The Teacher's Guide also offers differentiated outcomes. These outcomes are listed in the form of:

All students

Most students

Some students

Stretch zone: Each activity in the Student Book and the Practice Book has a Stretch zone question to support deeper learning. The Teacher's Guide provides additional notes on these activities.

Reflection time: Suggestions are made on how to bring the class back together to reflect on the learning and share ideas.

Answers: Answers to all the Student Book and Practice Book activities are provided.

Review pages: The Teacher's Guide has notes on the Review pages of the Student Book (summative assessment), with answers to the assessment questions, and the Practice Book (a formative, reflective review).

Digital resources: Where it is appropriate to use digital resources in a lesson, such as sharing the interactive Student eBook page on an interactive whiteboard (IWB), suggestions are embedded in the lesson plan.

Resources sheets: These photocopiable resources can be used with some of the main activities. They are referenced in the resources section of the lesson plan and are available on the Oxford Owl website (www.oxfordowl.co.uk).

Tour of a typical unit

Engage lesson

The 'Big question' provides a discussion stimulus about the key idea of the unit.

1 Numbers and counting

? How do we use numbers?

In this unit you will:

- count, read and write numbers to 100
- count in twos, fives and tens
- know and make numbers using objects and pictures
- use words such as equal to, more than, less than (fewer), most, least
- read and write numbers from 1 to 20 in words.

Learning objectives are stated clearly at the beginning of every unit.

Engage

Which numbers can you see in the classroom?

Which numbers can you see on your way to school?

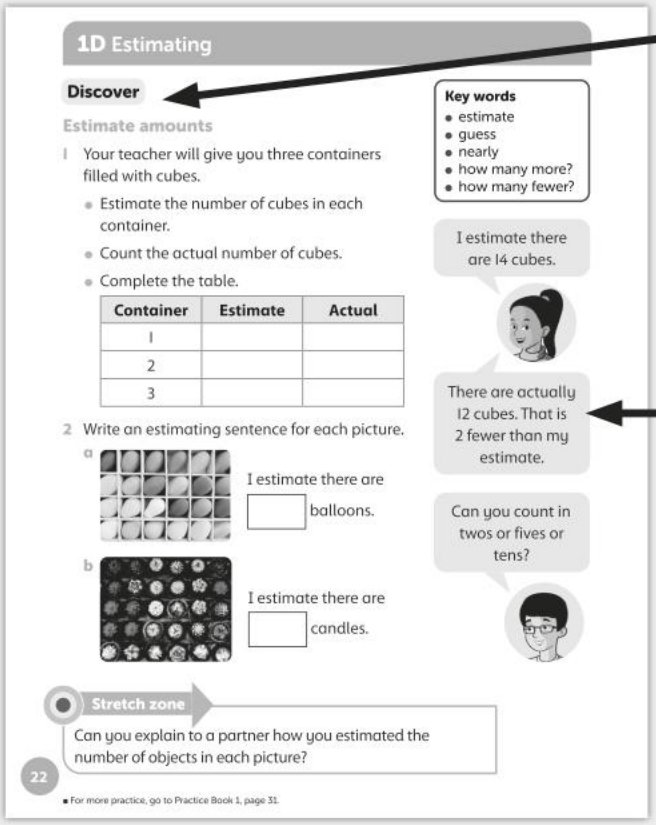
What is the biggest number you have ever seen?

Further questions allow students to develop communication skills.

6

The Engage spread is bright and colourful, with artwork or photos to spark interest in young students and provide discussion points.

Student Book Discover and Explore



Each Discover lesson introduces mathematics skills and concepts. These lessons often involve a practical activity or use of concrete resources.

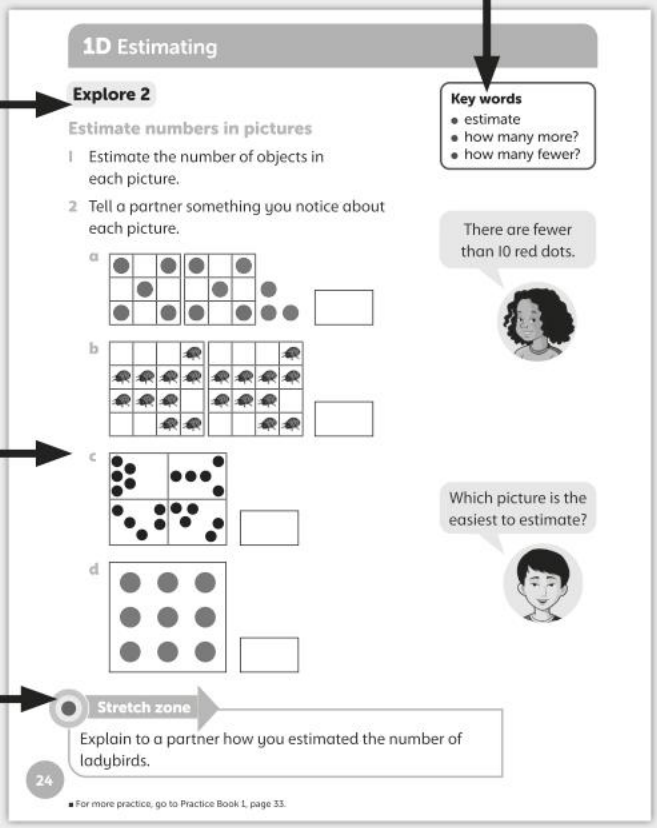
The speech bubbles provide useful hints, probing questions, or examples of how to complete a question. These help students who need a little extra support with the language or the mathematics.

The key words for the lesson are included on each page so they can be introduced in the context in which they are used.

Each Explore lesson allows students to practise the skills they learned in the Discover lesson. In these lessons, students are more likely to work independently or in pairs.

Step-by-step instructions guide students through the activities they will undertake.

Extension activities provide challenge for the most confident students.



Connect lesson

The Connect lesson makes links between the different areas of mathematics in the unit.

1 Numbers and counting

Connect

Make a number poster

Work as a group.

1 Collect some magazines. Talk about which magazines might have numbers in them. What do the numbers tell us?

Connect activities are often set in real-life contexts to make the link between mathematics and the real world.

2 Cut out pictures that have numbers.

3 Make a poster to display in class.

4 Talk in your group about the numbers you have found.

We use numbers to count or to say how many of something there are.

The 'Big idea' sums up what students have discovered in the unit. It answers the Big question on the Engage page.

What is the biggest number on your poster?

What is the smallest number on your poster?

Stretch zone

Take photographs of numbers on the way home from school. What job are the numbers doing? Explain your ideas to a partner.

A further extension activity provides a challenge for the most confident students.

Review lesson

Students' progress is assessed through the questions and tasks at the end of each unit. In Student Books 2 and 6, these questions reflect the style of the SATs (national Standard Assessment Tests).

1 Numbers and counting

Review

1 Draw the beads and write the numbers in the spaces.

Beads	Numbers	Words
	5	
		sixteen
		
		three
		
	12	
		nineteen
	1	
		four
	14	
		twenty

2 Samir has a bracelet with 19 beads. Lina's bracelet has one more bead than Samir's. How many beads are on Lina's bracelet? ☐

Celine's bracelet has 10 more beads than Lina's. How many beads are on Celine's bracelet? ☐

26

A word problem is always included on the Review page.

Practice Book Discover and Explore

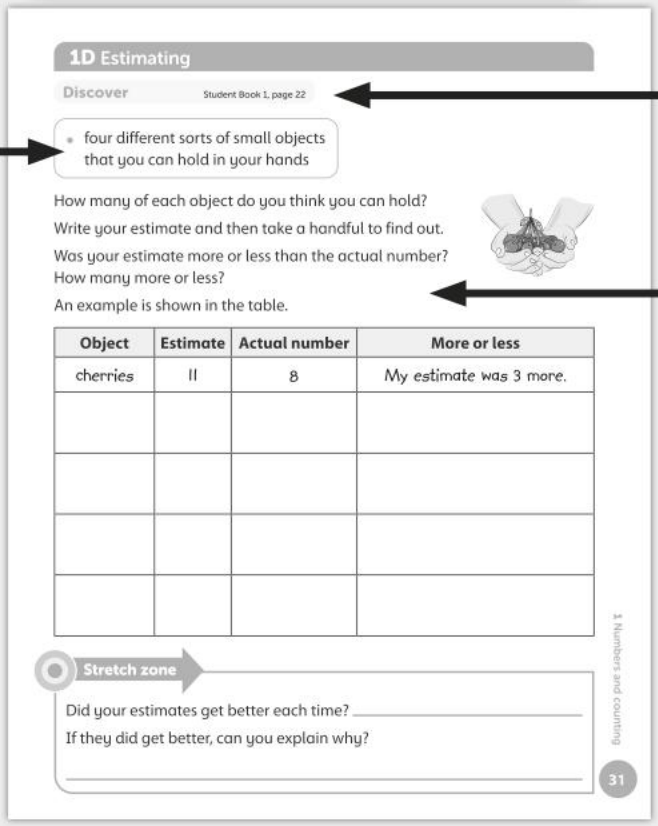
Practice Book activities can be completed in the school lesson or as homework.

Most of the Discover and Explore lessons in the Student Book have a corresponding page in the Practice Book. These activities provide opportunities for students to consolidate and deepen their learning.

Step-by-step instructions guide students through the activities they will undertake.

If students require concrete resources, these are listed in a box at the top of the page. This is particularly useful if students are completing the activities at home.

Extension activities provide challenge for the most confident students.



1D Estimating

Discover Student Book 1, page 22

- four different sorts of small objects that you can hold in your hands

How many of each object do you think you can hold?
Write your estimate and then take a handful to find out.
Was your estimate more or less than the actual number?
How many more or less?
An example is shown in the table.

Object	Estimate	Actual number	More or less
cherries	11	8	My estimate was 3 more.

Stretch zone

Did your estimates get better each time? _____
If they did get better, can you explain why?

1 Numbers and counting

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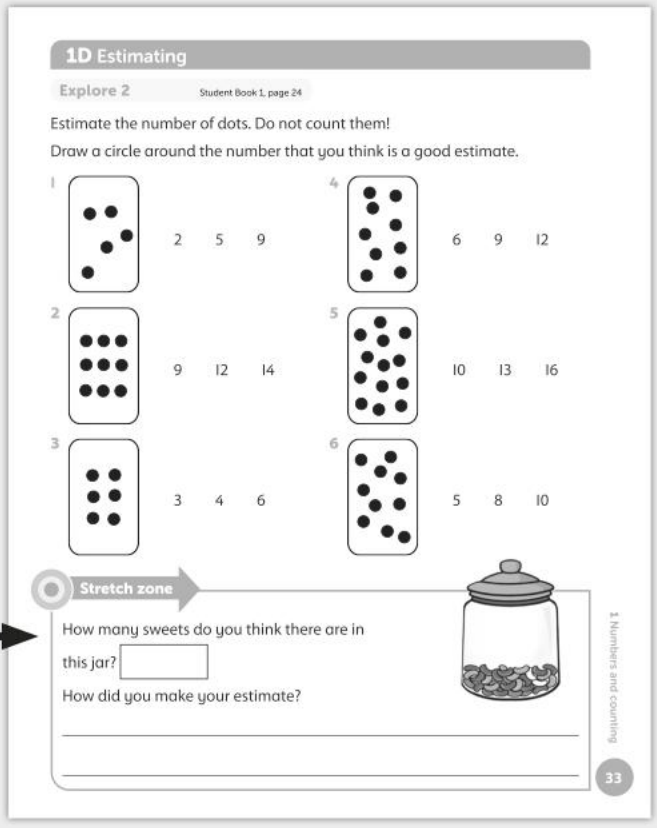

1D Estimating

Explore 2 Student Book 1, page 24

Estimate the number of dots. Do not count them!
Draw a circle around the number that you think is a good estimate.

1 2 5 9

2 9 12 14

3 3 4 6

4 6 9 12

5 10 13 16

6 5 8 10

Stretch zone

How many sweets do you think there are in this jar? ☐
How did you make your estimate?

1 Numbers and counting

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Practice Book Review

Each Review page in the Practice Book includes a reminder of all the topics learned in the unit.

1 Numbers and counting

Review

1 Draw a face next to each bubble to show how you feel about your learning.

counting objects

reading and writing numbers

counting in twos, fives and tens

estimating quantities

2 Tell a partner about one thing you did really well in this unit.

3 Draw or write about things you found easy, challenging or really hard.

Self-assessment activities help students to reflect on their learning.

What work did you feel confident doing?

What work was challenging?

Is there any work you might need some extra help with?

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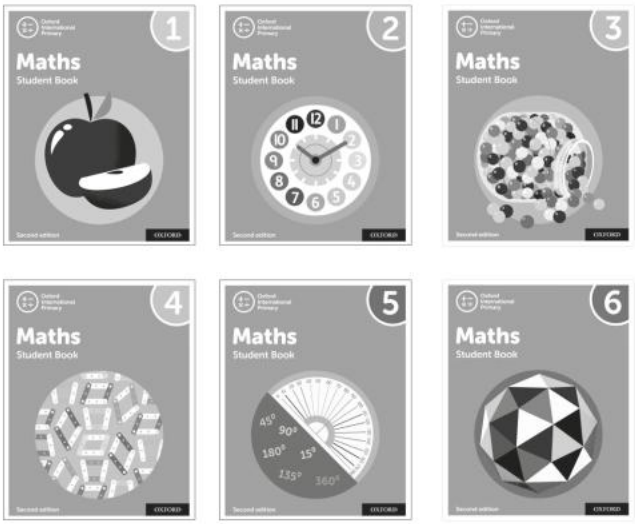
Component overview

The Student Books

The Student Books are write-in textbooks for students to read and use. There are six Student Books: one for each school year at primary school. The Student Books introduce learning through a mixture of practical, discussion and independent activities.

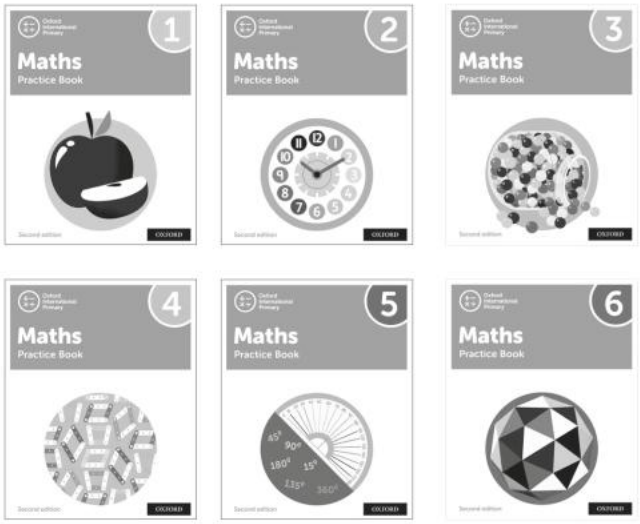
Student Book	Typical student age range
Student Book 1	Age 5–6
Student Book 2	Age 6–7
Student Book 3	Age 7–8
Student Book 4	Age 8–9
Student Book 5	Age 9–10
Student Book 6	Age 10–11



The Practice Books

The Practice Books are write-in workbooks for students to read and use. There are six Practice Books: one for each school year at primary school. The Practice Books provide deeper learning opportunities through a range of independent activities, which can be completed in school or at home.

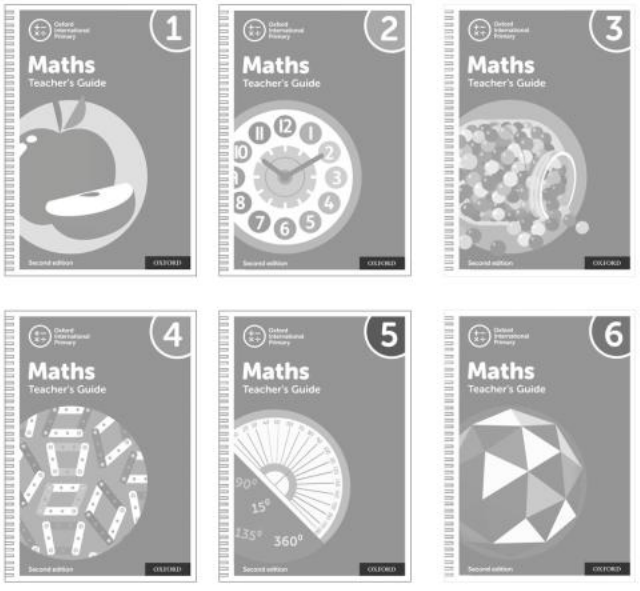
Practice Book	Typical student age range
Practice Book 1	Age 5–6
Practice Book 2	Age 6–7
Practice Book 3	Age 7–8
Practice Book 4	Age 8–9
Practice Book 5	Age 9–10
Practice Book 6	Age 10–11



The Teacher's Guides

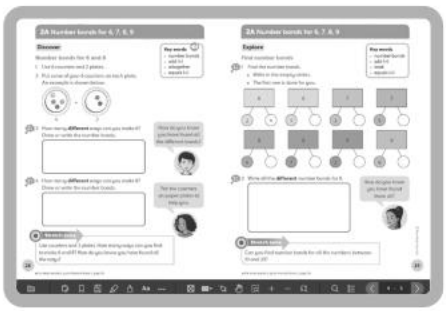
There are six Teacher's Guides: one for each school year at primary school. Each Teacher's Guide includes:

- an introduction with advice about delivering mathematics in primary schools using *Oxford International Primary Mathematics*
- a unit overview, giving advice on teaching each unit, including common misconceptions and how to deal with them
- a lesson plan for every lesson in the Student Book and corresponding pages in the Practice Book
- model answers to each question in the Student Book and Practice Book.



Digital resources

Interactive eBooks



For the teacher

Teachers can access the Student Books, Practice Books and Teacher's Guides online in eBook format, on the Oxford Owl website (www.oxfordowl.co.uk).

The enhanced eBooks show the course content on screen, making it easier for teachers to deliver engaging lessons.

For the students

Teachers can allocate an eBook version of the Student Books to students for use at home. The Student eBooks include interactive activities, worksheets and audio of all the key vocabulary,

Assessment resources

The downloadable assessment materials offer you additional opportunities to assess students' progress. The materials include:

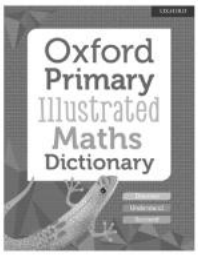
- end-of-unit summative assessment
- end-of-year summative assessment.

Every test comes with everything you need to assess and record progress including:

- answers
- mark schemes and guidance on assessment.

Oxford Primary Illustrated Maths Dictionary

The *Oxford Primary Illustrated Maths Dictionary* gives comprehensive coverage of the key maths terminology students use in the course. Entries are in alphabetical order, and each includes a clear and straightforward definition along with a fun and informative colour illustration or diagram to help explain the meaning. The dictionary is suitable for students with English as an Additional Language.



The curriculum

The Oxford International Curriculum offers a new approach to teaching and learning focused on wellbeing, which places joy at the heart of the curriculum and develops the global skills students need for their future academic, personal and career success.

Through six subjects – English, Maths, Science, Computing, Wellbeing and Global Skills Projects – the Oxford International Curriculum offers a coherent and holistic approach to ensure continuity and progression across every student's educational journey, equipping them with the skills to shape their own future. Through this approach, we can help your students discover the joy of learning and develop the global skills they need to thrive in a changing world.

1 Number and place value

Overview

Big idea

The main Big idea for this unit is place value. In the Hindu-Arabic numeral system we use, all numbers can be represented using just the ten digits from 0 to 9, so we count in base 10 – derived from the ten fingers on our hands. Numbers larger than 9 are made using powers of the base: tens, hundreds, thousands and so on.

This unit continues to develop students' understanding of the place-value system whereby the value of a digit depends on which position within a number it is written. When a digit moves one position to the left, its value increases ten times. When it moves one position to the right, its value decreases ten times. Using these conventions lies behind our counting and calculation methods. A key idea is that of exchange, so in calculations we want students to use the language of 'exchange one of these for ten of those' and so on. Place value is supported concretely using base-10 equipment or counters.

Look out for

- **Students who partition incorrectly because they do not understand the place value of digits**, for example a student who partitions 5042 as 5000 + 400 + 20. Using place-value cards to distinguish each digit can help with this, allowing them to see that the 4 represents 40 and the 2 represent 2 ones.
- **Students who struggle to build sequences where the numbers do not increase or decrease by the same amount from each number to the next**. Help them to calculate the differences between terms and look for a constant pattern in the differences.

Possible misconceptions

- **Students may think that to multiply by 10 you simply 'add a zero'.** This strategy only works for whole numbers. For example, when multiplying 12.7 by 10, simply 'adding a zero' gives the answer 12.70, which is the same number as the original. The correct answer (127) is ten times bigger. Encourage students to practise and develop their understanding. Say, *Multiplying by 10 makes the number ten times larger. Each digit moves to the left.* For example, for 21 × 10, 1 becomes 10 and 20 becomes 200.

Key vocabulary

- thousand, ten thousand, hundred thousand, 6/5/4-digit number, partition
- place holder, multiple, count on/back
- odd number, even number, negative number, positive number, below freezing
- decimal numbers, tenths, hundredths, thousandths, ten thousandths, hundred thousandths
- >, greater than, <, less than, round, rounding to the nearest …, approximately, ascending order, descending, order
- step size, sequence, number sequence, identify the rule, extend the sequence, rule of the sequence, pattern, generalisation

Coverage in lessons

Learning objective	E	1A	1B	1C	1D	1E	1F	1G	C	R
Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.		✓		✓		✓		✓	✓	✓
Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.	✓				✓					
Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.				✓	✓					
Round any number up to 1000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.			✓					✓	✓	✓
Solve number problems and practical problems that involve all of the above.				✓		✓		✓	✓	✓
Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.							✓			

1 Number and place value

Engage Student Book page 6

Big question

- How can I extend my knowledge of place value so that I understand numbers up to 1 million?

Global skills

- **Creative skills:** problem solving
- **Interpersonal skills:** communication/teamwork
- **Self-development skills:** reflecting on learning

Key vocabulary

- hundred thousand, ten thousand, positive numbers, negative numbers, tenths, hundredths, greater than >, less than <, partition, rounding to nearest … , sequence, multiple

Resources

- counting stick
- mini whiteboards and markers

Language support

Support students with the necessary language, providing definitions as necessary. Use phrases and questions that include the key vocabulary to reinforce it, for example:

- *A sequence is …*
- *What sequence did you make?*
- *Continue my sequence: 0.25, 0.5 …*
- *What is the next number in this sequence: 1.2, 1, 0.8?*

Introductory activity

Say, *Choose a step size that you can count in. Count in this step size with your partner.* Students might choose numbers they have practised previously. Encourage them to think of others, for example: fifties, tens of thousands, millions. Ask pairs to share their ideas.

Show them a counting stick and say, *Zero is at this end. Counting in steps of 150, what number goes at the other end?* Together, count from zero to the tenth multiple to confirm and then back to zero. *What happens when we count back from zero?* Agree that when you count back from zero you count in negative numbers. Together, count back from zero to the 10th multiple and then forward to zero again.

Main activity

Look together at page 6 of the Student Book. If you have access to an IWB, display the page. *What do you notice about the number labels on the counting stick? In what size steps are they counting in on this counting stick?* (twenty fives) *If you labelled the interval between each of these numbers what would they be?* (175, 225, 275, 325, 375) *What number label could you put at either end of the counting stick?* (125 and 425)

Ask students to work in pairs to complete each of the questions on page 6 of the Student Book. Encourage them to use whiteboards to explore the sequences. They should not expect to be able to find the sequences immediately. Discuss Vihaan's and Blaine's **sequences**:

- Vihaan started on $^{-}140$.
- Blaine's sequence was 150, 200, 250, 300, 350, 400. His step size was 50.

Differentiation

Supporting: Choose a start number and step size to get students started on making a number sequence.

Consolidating: Ask students to explain their thinking as they work out the sequences in the Student Book.

Extending: Set challenges that involve students creating sequences by counting forwards and backwards in fractions and decimals, including below zero, and Roman numerals.

Reflection time

Ask pairs to write one of their sequences on the board. Discuss how to find the step sizes. Then invite the rest of the class to continue the sequence. They should also work in pairs to complete the sequences on their whiteboards.

1A Place value

Discover Student Book page 7 • Practice Book page 14

Specific learning focus

- Know what each digit represents in 5- and 6-digit numbers.
- Be able to pronounce the number names correctly.

Global skills

- **Creative skills:** exploring
- **Real-world skills** interpreting information
- **Interpersonal skills:** communication
- **Self-development skills:** reflecting on learning

Key vocabulary

- hundred thousand, ten thousand, thousands, hundreds, tens, ones

Resources

- Resource sheet 1.1: place-value table

Language support

Listen to students say the numbers that they made up. Encourage them to say them in full and not to say each digit separately, for example:

456 341 is '*four hundred and fifty-six thousand, three hundred and forty-one*'.

Model this in discussions with students.

Introductory activity

Ask five students to give you a digit 0–9. As they do, write the digits on the board, writing each new digit on the right-hand end of the previous number, building to a 5-digit number. Ask the class to tell you what the number is. For example: starting with the digit 4 – *four*, 42 – *forty-two*, 425 – *four hundred and twenty-five*, 4253 – *four* ***thousand*** *two hundred and fifty-three* and so on. Point to each digit in turn and ask students to write down what its value is. For example, for the 2 in 42 537 in the thousands place, they write 2000.

Now repeat the activity but 'grow' the number from the left-hand end, for example 46, 846, 1846, 51 846. Complete with saying each number aloud and writing the value of each digit.

Main activity

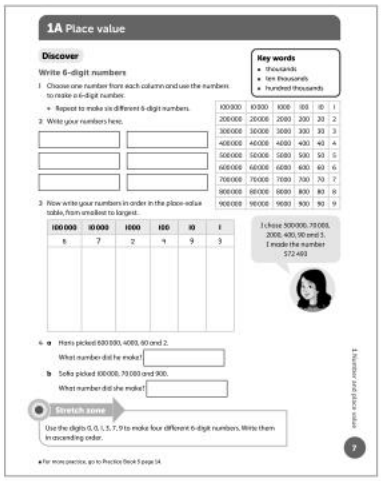
Ask students to count in hundreds from the number you have made at the start of the Introductory activity until they cross the hundreds boundary into the next thousand. Record the count on the board so that students can see and explain the pattern.

Do this for counting in thousands and tens of thousands. Repeat this process several times. Include 6-digit numbers.

Look at page 7 of the Student Book together. Ask questions to prompt students to reflect and share what they know about place-value tables, for example:

- *How much do the numbers increase as you move down the first column? How much do they increase as you move down the second column?*
- *What happens to the numbers in a row as you move from right to left?*

Students should work in pairs to complete the questions on page 7 of the Student Book. They can use Resource sheet 1.1 as they work.


1A Place value

Discover

Write 6-digit numbers

Key words
- thousands
- ten thousands
- hundred thousands

1. Choose one number from each column and use the numbers to make a 6-digit number.
   - Repeat to make six different 6-digit numbers.
2. Write your numbers here.
3. Now write your numbers in order in the place-value table, from smallest to largest.

100 000	10 000	1000	100	10	1
6	7	2	9	9	3

I chose 500 000, 70 000, 2000, 400, 90 and 3. I made the number 572 493

4. a Hans picked 600 000, 4000, 90 and 2.
   What number did he make?
   b Sofia picked 100 000, 70 000 and 900.
   What number did she make?

Stretch zone

Use the digits 0, 0, 1, 3, 7, 9 to make four different 6-digit numbers. Write them in ascending order.

For more practice, go to Practice Book 1 page 14.

7

Differentiation

Supporting: Ask students to read their numbers to you so that you can support them in saying the numbers correctly.

Consolidating: Encourage students to support other students who are less confident.

Extending: Ask students to count on in hundreds and thousands aloud from the numbers they are making.

Stretch zone: *Use the digits 0, 0, 1, 3, 7, 9 to make four different 6-digit numbers. Write them in ascending order.*

Check that students are clear on what ascending means before they begin. You could also ask students to make up 5-digit numbers. Then ask them to count on 12 times in steps of 100, 1000 or 10 000 and to write the new number.

Reflection time

Ask pairs to say one of the numbers that they made up. Write them in a random order on the board. Ask them to tell you a way to find out which is the highest and which is the lowest. Accept any solutions that are correct. Ask students to do this on their whiteboards or paper. This will help you to assess their understanding.

Practice Book: Students complete Practice Book page 14. They can do this directly after the Main activity, as homework, or as the focus of a separate mathematics session to help students consolidate their learning and build fluency. Confirm that children can say how many digits there are in 1 million (7).

Differentiated outcomes	
All students	should create and say 6-digit numbers correctly with support.
Most students	will create and say 6-digit numbers correctly and be able to explain how they know they are correct.
Some students	may understand place value in numbers beyond 6-digits.

Answers

Student Book page 7

Answers will vary because students make their own numbers and order them. For example:

1 and 2 247 315

819 637

593 728

725 491

461 826

3 247 315, 461 826, 593 728, 725 491, 819 637

4 Haris: 604 062

Sofia: 170 900

Practice Book page 14

Students choose digit cards to make their own 6-digit numbers, so answers will vary. Check that they have written the numbers in order correctly, starting with the smallest, and that they have written the correct number names in words.

Stretch zone: 1 023 456 – one million, twenty-three thousand, four hundred and fifty-six.

1A Place value

Explore

Student Book pages 8–9 • Practice Book page 15

Specific learning focus

- Partition any number up to one million into thousands, hundreds, tens and ones.

Global skills

- **Creative skills:** investigating
- **Real-world skills** presenting information
- **Interpersonal skills:** communication

Key vocabulary

- hundred thousand, ten thousand, thousand, hundred, tens, ones, partition,>, <

Resources

- 0–9 digit cards
- place-value counters
- place-value tables (optional)

Language support

Start a working wall to display examples of 6-digit numbers students have made, with the words for how to say them aloud next to them. For example, display, 926 043: nine hundred and twenty -six thousand and forty-three.

Introductory activity

Use a set of digit cards. Ask a student to choose and place six digit cards on the table. Write on the board three different numbers that can be made with the six digits. Ask students to look at the numbers and take turns to say them aloud to a partner. Ask different students to tell you, for example, digits that show the hundreds and ten thousands. Ask them to write these in numbers, for example 6000. Next, ask them to swap different digits and to read the new number.

Ask, *Is it bigger or smaller than the previous number? By approximately how much?*

For example:

- if they swap the 3 and 0 (926 043)

the number is smaller by approximately 300

- if they swap the 2 and 6 (962 043)

the number is bigger by approximately 40 000.

Ask them to explain their thinking at each step.

Discuss the role of the zero as a place holder.

Ask, *Remove the zero. What is the number without the zero?*

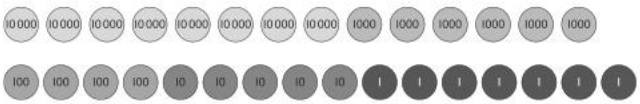
Repeat this process with different students.

Main activity

Point out the speech bubbles on page 8 of the Student Book. Can students see how the digits chosen have been listed for their values in the table and then set out with place-value counters in question 2? Ask students to work in pairs and to make a 5-digit number using their digit cards. Ask them to write this down and then to **partition** it, for example:

86 457 = 80 000 + 6000 + 400 + 50 + 7

For each number made, pairs set it out using place-value counters and say the number aloud. The example above would be *eighty-six thousand, four hundred and fifty-seven* represented with eight 10 000 counters, six 1000 counters, four 100 counters, five 10 counters and seven 1 counters.

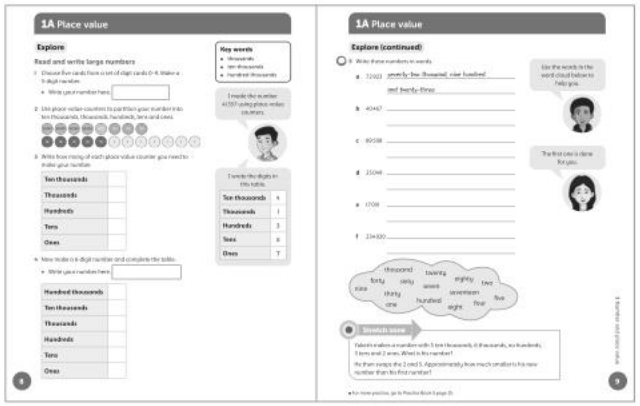


Students should record how many of each counter they used in the table. When they have made three or four more examples, ask them to do the same for five 6-digit numbers. At each stage, students should read their numbers to their partner.

Ask questions such as:

- *How can you partition your 5-digit number?*
- *Which is the hundreds digit?*
- *The tens of thousands digit is …*
- *Is this number bigger or smaller than your previous number? By approximately how much?*

For the second part of the activity in the Student Book, students need to write numbers in words. Encourage them to read the numbers aloud and to check with their partner. Remind them of the conventions of writing numbers in words, for example placing a comma after the thousands and hyphenating any 2-digit numbers greater than 20 that we say, such as eighty-two thousand, six hundred and twenty-one.



Differentiation

Supporting: Provide students with a place-value table.

Consolidating: Ask students to explain the values of the digits in their numbers.

Extending: Challenge students to think of the values in different ways. For example, in 41 357 there are 5 tens, but there are also 35 tens, or 135 tens and so on.

Stretch zone: *Yukesh makes a number with 5* ***ten thousands****, 6 thousands, no hundreds, 3 tens and 2 ones. What is his number? He then swaps the 2 and 5. Approximately how much smaller is his new number than his first number?*

Check that students record the number as 56 032 and that if you swap the 2 and the 5 the new number is 26 035, which is approximately 30 000 smaller.

Ask students to explore the effect of swapping two digits in a 5-digit number.

Reflection time

Invite individual students to write one of their numbers on the board. Ask them to point to each digit in turn starting from the left-hand digit. The class says what the digits are. Then ask the class to partition that number. Finally, discuss the Stretch zone question. Ask, *What happened when Yukesh swapped the two digits? Approximately how much smaller/bigger are they? How did you work that out?*

Practice Book: Students complete Practice Book page 15. They can do this directly after the Main activity, as homework, or as the focus of a separate mathematics session to help students consolidate their learning and build fluency. Ask students to tell you what the symbols < and > represent. Discuss how you complete a statement that includes more than one inequality symbol.

Differentiated outcomes	
All students	should create and say 6-digit numbers using a place-value table and counters, for example, for support.
Most students	will create, say, write in words and partition 6-digit numbers.
Some students	may be able to partition in more than one way and be able to describe how a number changes when the place of its digits are changed.

Answers

Student Book pages 8–9

Answers will vary because students make their own 5- and 6-digit numbers. For example, for page 8:

1 63 281

2 (Students use place-value counters to partition their number.)

3

Ten thousands	6	Tens	8
Thousands	3	Ones	1
Hundreds	2		

4 804 953

Hundred thousands	8	Hundreds	9
Tens of thousands	0	Tens	5
Thousands	4	Ones	3

5 **b** forty thousand, four hundred and sixty-seven

c eighty-nine thousand, five hundred and eight

d twenty-five thousand and forty-nine

e seventeen thousand and one

f two hundred and thirty-four thousand and twenty

Practice Book page 15

Answers will vary because students choose digits 0–9 to make their own decimal numbers to use for number sentences. They then use the digits to find specified numbers.

Stretch zone: One hundred and twenty-three thousand, four hundred and fifty-six.

Answers will vary depending which digits are swapped.

1B Rounding

Discover

Student Book page 10 • Practice Book page 16

Specific learning focus

- Round 4-digit numbers to the nearest 10, 100, 1000, 10 000 or 100 000.

Global skills

- **Creative skills:** problem solving/exploring
- **Real-world skills** presenting information
- **Interpersonal skills**: communication/teamwork

Key vocabulary

- hundred thousand, ten thousand, greater than >, less than <, rounding to the nearest …

Resources

- 0–9 digit cards
- Resource sheet 1.2: number lines

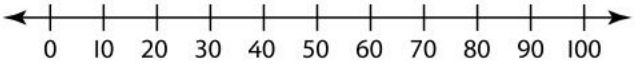
Language support

Provide students with sentence frames to support them in their discussions of rounding, for example:

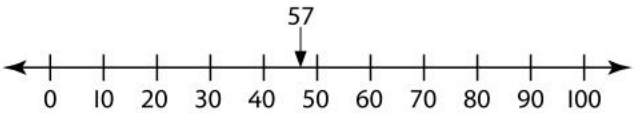
- ___ rounded to the nearest ___ is ___.
- I rounded down because ___ was closer to ___.
- I rounded up because ___ was closer to ____.

Introductory activity

Draw a number line on the board with 0 at one end and 100 at the other. Mark the tens divisions.



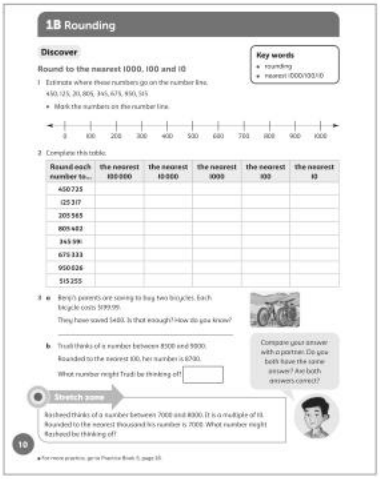
Invite individual students to position different numbers on the line, starting with a two-digit number. As they place their number ask, *Which ten is nearest to your number? How do you know?* Ask students to mark the midpoint between the tens for their number to show how they can tell which ten is nearer. For example, if the student chooses 57, ask, *Is 57 nearer to 50 or to 60?* (60) *Can you tell me why?* (Students mark 55 as the midpoint between 50 and 60, then say that 57 is nearer to 60 as it is past the midpoint.)



Main activity

Extend the Introductory activity with 5-digit numbers, with students placing them on a 0 to 100 000 number line with the ten thousand divisions marked. Build up to this using number lines to 1000 and 10 000 first, if appropriate. Ask similar questions to enable students to describe the positions of the numbers, for example: *Which pair of ten thousand numbers does your number fall between? Which ten thousand is nearest your number?*

Students should then work in pairs on the Student Book activities. When answering the word problems, they take it in turns to round a number and explain to their partner why they are rounding up or down.


1B Rounding

Discover

Round to the nearest 1000, 100 and 10

Key words
- rounding
- nearest 1000/100/10

1 Estimate where these numbers go on the number line.
450 125, 20, 805, 345, 675, 950, 515
- Mark the numbers on the number line.

0 100 200 300 400 500 600 700 800 900 1000

2 Complete this table.

Round each number to...	the nearest 100 000	the nearest 10 000	the nearest 1000	the nearest 100	the nearest 10
450 725					
125 317					
205 565					
805 402					
345 591					
675 333					
950 026					
515 255					

3 a Benji's parents are saving to buy two bicycles. Each bicycle costs $199.99.
They have saved $400. Is that enough? How do you know?

b Trudi thinks of a number between 8500 and 9000.
Rounded to the nearest 100, her number is 6700.
What number might Trudi be thinking of?

Compare your answer with a partner. Do you both have the same answer? Are both answers correct?

Stretch zone

Rasheed thinks of a number between 7000 and 8000. It is a multiple of 10.
Rounded to the nearest thousand his number is 7000. What number might Rasheed be thinking of?

10

For more practice, go to Practice Book 1, page 16.

Differentiation

Supporting: Support students to come to an understanding of rounding 6-digit numbers by using number lines such as those on Resource sheet 1.2.

Consolidating: Ask students to explain their strategies for creating and placing each number on a number line and rounding.

Extending: Ask students to create their own rounding word problems.

Stretch zone: *Rasheed thinks of a number between 7000 and 8000. It is a multiple of 10. Rounded to the nearest thousand his number is 7000. What number might Rasheed be thinking of?*

Students should identify possible number (that is, multiples of 10 from 7010 to 7490).

Reflection time

Invite students to share their answers. Ask: *How did you round the numbers in the table?* The rest of the class check their work to make sure that they agree. Discuss the possible answers to the word problems. To finish the lesson, choose some pairs who completed the extension activity to share their word problems. Students should work on these in pairs and the pair who created the problem should model the answer at the front of the class.

Practice Book: Students complete Practice Book page 16. They can do this directly after the Main activity, as homework, or as the focus of a separate mathematics session to help students consolidate their learning and build fluency.

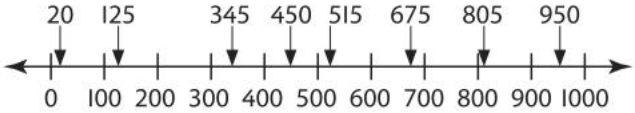
Tell students that it is fine for them to draw additional number lines on a separate sheet of paper for each number to support them in rounding to the nearest 10, 100 and 1000.

Differentiated outcomes	
All students	should round accurately by using a marked number line.
Most students	should round accurately by using a number line.
Some students	may begin to round without a number line.

Answers

Student Book page 10

1 Check that students have written the numbers on the number line in the correct places.



2

	Round to nearest 100 000	Round to nearest 10 000	Round to nearest 1000	Round to nearest 100	Round to nearest 10
450 725	500 000	450 000	451 000	450 700	450 730
125 317	100 000	130 000	125 000	125 300	125 320
205 565	200 000	210 000	206 000	205 600	205 570
805 402	800 000	810 000	805 000	805 400	805 400
345 591	300 000	350 000	346 000	345 600	345 590
675 333	700 000	680 000	675 000	675 300	675 330
950 026	1 000 000	950 000	950 000	950 000	950 030
515 255	500 000	520 000	515 000	515 300	515 260

3 a Benji's parents have enough money because $199.99 rounded is $200 and two lots of $200 is $400. $199.99 is just less than $200 so they have enough.

b Trudi's number could be between 8650 and 8749.

Practice Book page 16

Answers will vary because students choose digit cards to make their own 4-digit numbers. Check that students have written their numbers in the table in order, starting with the smallest, and that they have rounded them to the nearest 10, 100 or 1000 correctly.

Stretch zone: Check that students have marked their chosen numbers correctly on the number line.