Contents

Authors/Contributors

enVisionMATHS has an extensive expert author and consultancy team, including nationally and internationally recognised researchers and leading classroom teachers from across Australia.

enVisionMATHS Author Team Year 1

Terri Bullock

Terri Bullock has been teaching at primary and infant level with the NSW Department of Education for 10 years. She has been a mathematics coordinator for the past three of those years, focusing on the importance of everyday mathematics and problem solving.

Terri has developed a deep understanding of the fundamental mathematical skills that children develop during their first few years of school. Mathematics is about solving problems — and this is what Terri aims to do every time she immerses children in a mathematical learning experience. She has also had the opportunity to share her mathematical teaching expertise with other teachers through professional development programs.

Terri is excited to be involved with **enVisionMATHS**. She believes that the in-depth coverage of the curriculum and the flexibility of the program will boost students' mathematical skills and understanding, and their achievement levels.

Judy Lewis

Judy Lewis is an educational resource writer. She has most recently co-written a science and technology interactive website for upper and lower primary schools, called *Stretch*. This website is now part of Pearson Australia's website, Pearson Places. Prior to this Judy worked as a content writer for a successful Australian mathematics website. Judy is a primary school teacher with many years' classroom teaching experience in the independent school system. She has a postgraduate certificate in gifted and talented education and has worked as a gifted and talented coordinator in an independent school. Judy is passionate about creating engaging learning experiences through resource development as well as in the classroom.

Carmen Morgan

Carmen Morgan has taught in various education systems for the last 26 years. Her work involves teaching the whole spectrum of students from those who are having learning difficulties to those who need extension and enrichment. She has presented at maths and IWB conferences for primary publishers, and conducts ongoing professional development and mentoring for teachers.

Carmen has a passion for teaching mathematics and believes the combined elements of the **enVisionMATHS** program, with its provision for differentiation and mathematical skill and thinking development, gives teachers the necessary tools to engage all students in learning mathematics.

Kerrie Shanahan

Kerrie Shanahan has worked as a primary school classroom teacher, and has also taught tertiary students at the Education Department of The University of Melbourne. Kerrie has been a professional writer for over ten years, publishing works in both the trade and the educational markets. She has written and published almost 50 children's books for different reading programs. She has also written teacher resource materials for a range of areas, including integrated curriculum, spelling, literacy, reading comprehension, writing and maths. Kerrie believes that the **enVisionMATHS** program will excite and motivate students to learn about maths in a hands-on way. She believes that the program will allow teachers to cater for every student in their class at their own individual level.

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Matt Skoss

Matt Skoss is an experienced classroom teacher based in Alice Springs. He has taught years 7 to 11 since 1987, as well as enjoying several curriculum roles with a mathematics and ICT focus for NT Department of Education and Training. He also offers professional learning services on a consultancy basis, with a particular interest in supporting remote and country schools. He has a strong belief in making mathematics visual and accessible to all students, using rich mathematical problems to extend students. He likes to make use of learning technologies and Web 2.0 tools to amplify student learning, leading to the development of a community of learners.

Greg Thomas

Greg Thomas is currently working at St Martin Tours Primary School in Rosanna, Victoria. Greg has taught in the Catholic sector for the past 19 years. During this time, he has held numerous leadership positions in administration and curriculum. Greg spent six years working with the Catholic Education Office on the program Success in Numeracy Education (SINE). While working with SINE he provided teachers with professional development and modelled lessons in classrooms. He was also involved in writing assessment tools and assisted in writing AIM papers. Greg believes solid foundations of skills and concepts are needed so children can engage in real-life maths experiences that cater for individual learning styles.

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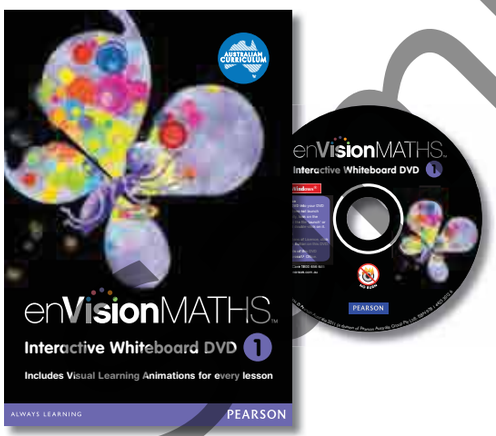
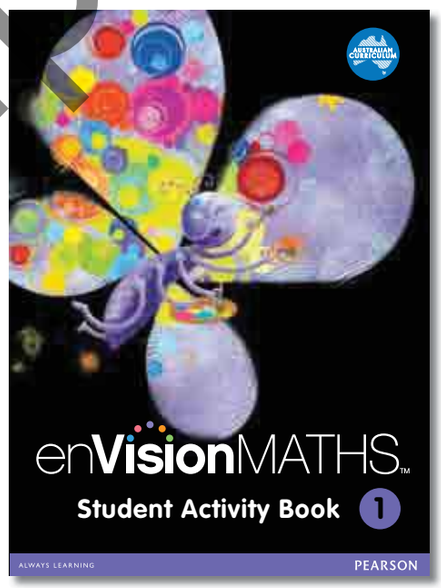
What is enVisionMATHS?

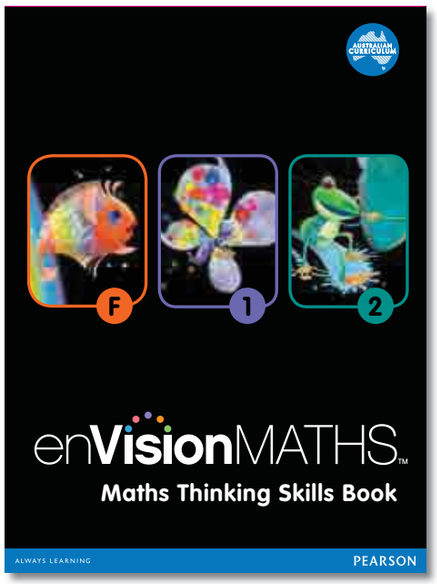
enVisionMATHS is a multi-component, topic-driven print and digital teaching and learning program aligned to the Australian Curriculum that gives primary students a deeper conceptual understanding of and higher proficiency in maths. The program incorporates powerful visual learning strategies that make meaningful connections between known and new maths ideas. Differentiated teaching and learning strategies allow teachers to tailor their teaching methods to improve students' learning. The program features extensive teacher support materials, including maths background knowledge, differentiation strategies, instructional questions, suggested lesson sequences and a range of assessment tasks.

The **enVisionMATHS** program at year 1 includes these elements:

- Teacher Resource Box
- Interactive Whiteboard DVD
- Activity Zone
- Student Activity Book
- Maths Thinking Skills Book.







enVisionMATHS is designed to be modular with no prescribed sequence, and this is largely achieved through its topic-driven structure. It can be used for whole-school curricular purposes and NAPLAN assessment preparation as required, and is aligned directly to the new Australian Curriculum. The topics, however, are presented in numerical order to provide a suggested appropriate sequence if this is sought.

This topic-based program also allows for easy links to all the **enVisionMATHS** resources provided in the program, as all these resources are connected by topic.

The topics not only provide a range of lessons that suit the Australian Curriculum but include lessons beyond the Curriculum for further exploration and enrichment.

The number of lessons varies in each topic, depending on the year level and the topic's complexity.

Year 1 Topics	
Topic 1	Numbers and Place Value to and Beyond 20
Topic 2	Addition Concepts
Topic 3	Length, Capacity and Mass
Topic 4	Place Value 10s and 1s and Money
Topic 5	Addition Strategies
Topic 6	Shapes and Objects
Topic 7	Time and Location
Topic 8	Subtraction
Topic 9	Numbers and Place Value to 100
Topic 10	Fractions: Equal Parts of Shapes
Topic 11	Data, Graphs and Chance
Topic 12	Making and Sharing Groups
Topic 13	Patterns

Provided for each topic:

- Teacher Resource Booklet
- Student Lessons
- Games, Investigations and Digital Activity cards
- Assessment

Digital Environment

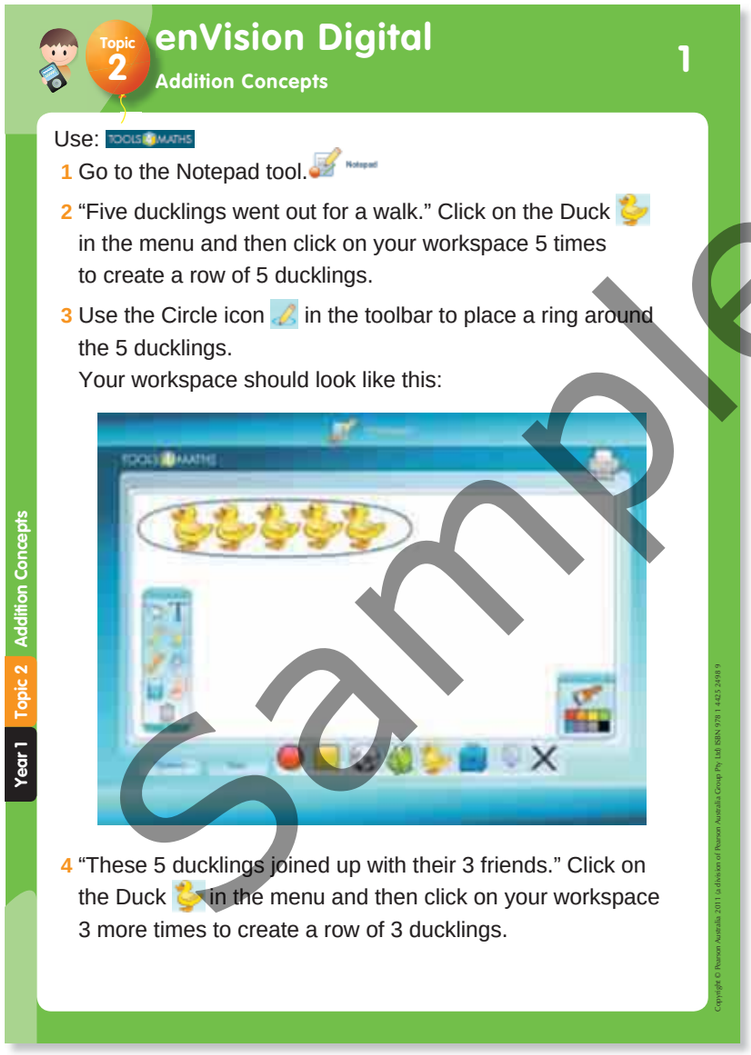
enVisionMATHS includes rich digital elements for both teachers and students:

- Digital Activity Cards (in the Activity Zone)
- Teacher Resource DVD: editable teacher planning, assessment, Differentiated Worksheets, Visual Learning Bridges
- Interactive Whiteboard DVD: Visual Learning Animations, Visual Learning Bridges, Tools4Maths.

enVision Digital Cards

enVision Digital Cards are included in the Activity Zone and provide topic-based digital tasks and activities for students to undertake with teacher support or on their own.

These are designed to be used with Tools4Maths.



Teacher Resource DVD

The year 1 Teacher Resource DVD (included with this Overview and Implementation Guide) contains editable teacher planning material, Interview, Pre- and Post-assessment questions, Visual Learning Bridges and Differentiated Worksheets for all year F, year 1 and year 2 lessons within the **enVisionMATHS** program.

Interactive Whiteboard DVD

The year 1 IWB DVD contains all Visual Learning Bridges (VLBs) and Animations (VLAs) for year 1, together with Tools4Maths.

Tools4Maths

Tools4Maths is a suite of digital, lively, animated maths learning tools covering place value, counters, money, fractions, shapes and 3D objects, measurement, time, geometry, graphs and probability.

These tools are designed for use either on the class whiteboard or by students (individually or in groups) on their own computers.

Tools4Maths can be used for extension activities to provide further enrichment, or to provide further explanation and practice to aid conceptual understanding.

Conceptual Understanding

enVisionMATHS is designed to foster in students a deep understanding of the mathematical concepts being introduced. This also aligns with the Australian Curriculum's Understanding proficiency strand:

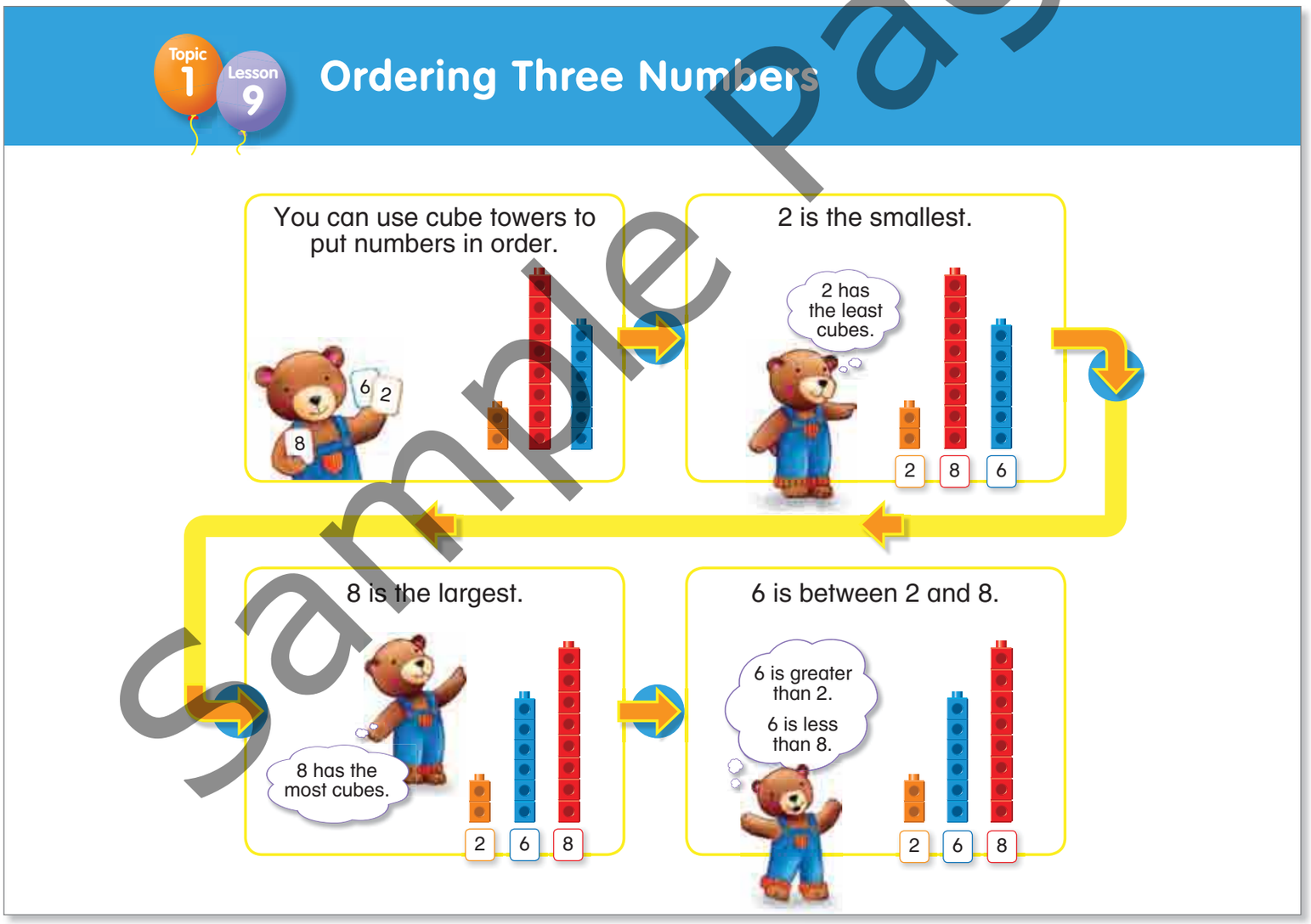
Students build a robust knowledge of adaptable and transferable mathematical concepts. They make connections between related concepts and progressively apply the familiar to develop new ideas. They develop an understanding of the relationship between the 'why' and the 'how' of mathematics. Students build understanding when they connect related ideas, when they represent concepts in different ways, when they identify commonalities and differences between aspects of content, when they describe their thinking mathematically and when they interpret mathematical information.

ACARA, 2010

Extensive research for the **enVisionMATHS** program has shown that daily, problem-based, interactive maths learning, accompanied by visual learning strategies, deepens students' conceptual understanding by making meaningful connections and delivering strong, sequential visual/verbal connections through the Visual Learning Bridge (VLB) in every lesson.

These VLBs provide different ways of looking at mathematical concepts to ensure all learning styles are catered for.

The VLBs are supported and reinforced by the accompanying Visual Learning Animation.



Visual Learning Bridge

Visual Learning

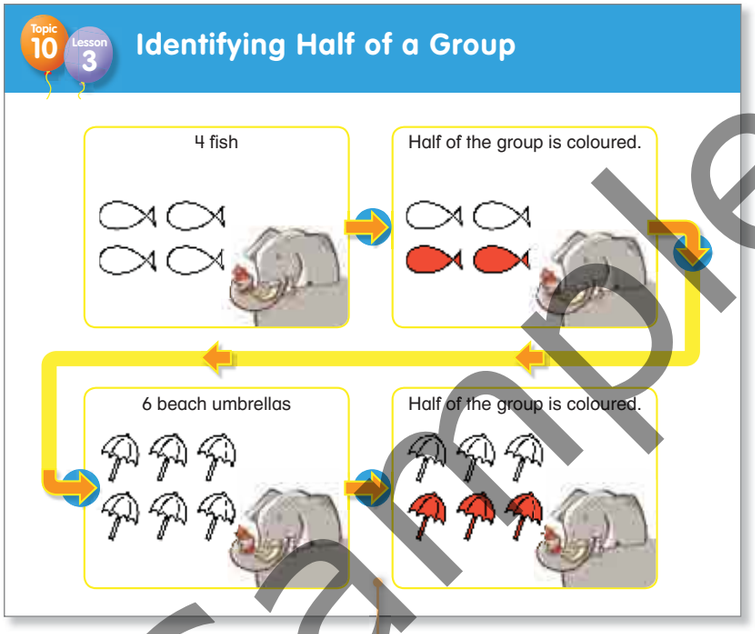
Research has shown that visual learning strategies deepen conceptual understanding by making meaningful connections for students and delivering strong, sequential visual/verbal connections.

enVisionMATHS focuses strongly on many visual learning strategies. Visual material is used extensively throughout the program: number lines, fractions strips, arrays, Visual Learning Bridges (VLBs), Visual Learning Animations (VLAs) and more.

Visual Learning Bridges

The Visual Learning Bridges (VLBs) link the mathematical concepts to real-life situations, thereby making maths less abstract and more meaningful to students.

The VLBs demonstrate the main aspects of a mathematical concept and act as a reference guide for students. They also allow parents to see and understand their child's current maths learning.

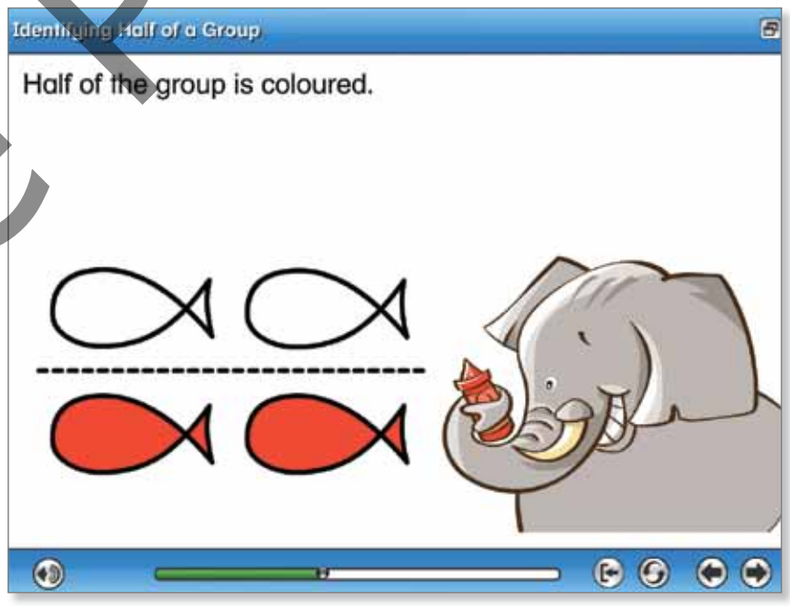


Visual Learning Bridge (VLB): presents information in different ways to engage all types of learners.

Visual Learning Animations

The Visual Learning Animations (VLAs) link the mathematical concepts to real-life situations making maths more meaningful to students. There is one VLA for each year 1 lesson.

The VLAs support and reinforce the VLBs.

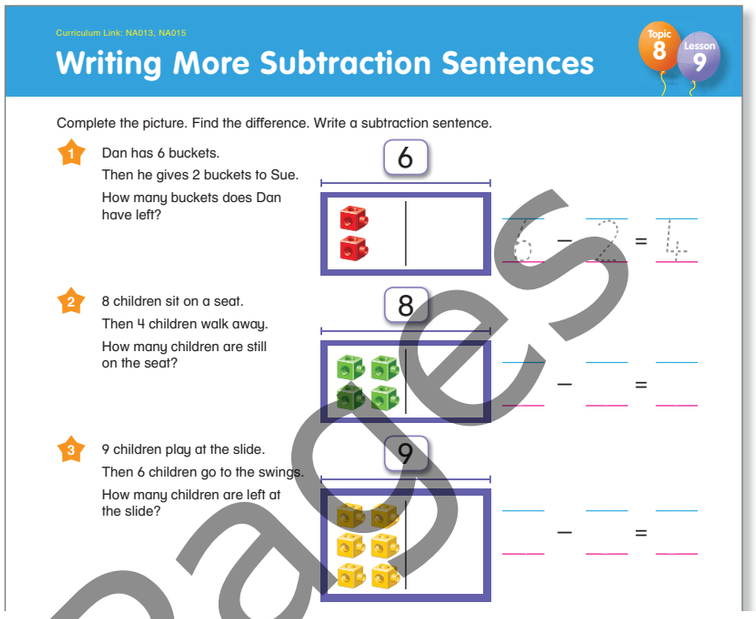


Bar Diagrams

Bar diagrams help students solve problems with visual models.

These pictorial bar diagrams are used consistently throughout **enVisionMATHS** in appropriate formats for each year level. The diagrams are designed to represent abstract maths concepts in a visual image, and to link pictorial models with mathematics symbols. This helps the student visualise abstract concepts, and aids in conceptual understanding.

Research says that bar diagrams can be a key to success in problem solving. Bar diagrams help students to understand relationships between quantities in the problem and this helps students to choose a correct operation to solve the problem (Diezmann and English, 2001).



Bar Diagrams

Tools4Maths

Tools4Maths provides another means of adding visual material to the classroom and provides visual explanations that are sometimes not possible to achieve with concrete materials. For example; changing 3D objects into their nets and building them again; breaking down money into its possible denominations; and breaking place-value blocks into units.

Differentiation

The amount of differentiation in the classroom depends on the needs of the class and the planning by the teacher.

enVisionMATHS has differentiation possibilities embedded throughout the program. For each year 1 topic, the Teacher Resource Booklets provide extra activity ideas for ESL and additional needs students, topic engagement links to suit all levels of understanding, suggested questions and prior knowledge tasks. For each lesson there are Differentiated Worksheets at three levels, and Activity Zone cards suited to a variety of skill levels.

Teacher Resource Booklet

ESL ideas

Additional Needs ideas

Maths Language

Vocabulary

The Language of Numbers and Place Value to 20

Knowing the names of the numbers in our number system is crucial for students to develop a working knowledge of this system. The following terms will all be encountered in this topic.

Review Vocabulary	*New Vocabulary*
Zero	Before
One	After
Two	Between
Three	Less than
Four	Greater than
Five	Largest
Six	Smallest
Seven	
Eight	
Nine	
Ten	
Eleven	
Twelve	
Thirteen	
Fourteen	
Fifteen	
Sixteen	
Seventeen	
Eighteen	
Nineteen	
Twenty	
Number	

Connection to Everyday Vocabulary

Making real-life connections to vocabulary can strengthen students' understanding of mathematical terms.

Number

Remember, a number is a word and a matching symbol that tell exactly how many items are in a group.

Before

Remember, when using a number line, a number that comes before a given number is to the left of the given number, and is less than the given number.

I brush my teeth before I go to bed.

After

Remember, when using a number line, a number that comes after a given number is to the right of the given number, and is larger than the given number.

I ride my bike after I put my helmet on.

Between

Remember, when using a number line, a number that comes to the right of a given number and to the left of another number is between those two numbers.

I am between my brother and my sister.

Vocabulary Activities

Memory

Use flash cards to play a game of memory. Write the name of each number from zero to 20 on a separate flash card. On another set of cards write the symbol for the numbers from zero to 20. Place cards face down and have the students sit in a circle around the cards. Choose a student to turn over two cards. If they match, the student keeps the pair. Continue until all pairs are collected. If students need additional support, add dots to the cards to show how many.

Draw and Label

Ask students to choose three numbers from 1 through to 20 and have them write the name of the number and illustrate each one with the appropriate number of objects.

one five two

Illustration: Marc Wion

Meeting Individual Needs

ESL

ESL STRATEGY

Considerations for ESL Students

Students who are learning English may or may not have well-developed counting skills in their first language. All students will need to learn the names of the numbers in English. Repeated exposure to the numbers zero through to 20 will help English language learners.

- **Beginning** If students are not proficient in knowing the English names of the numbers, provide them with many opportunities to count. Count sets of objects as a whole group. Make two sets of objects and count each one. Say a number and have the student point to the correct group.
- **Intermediate** Support students in learning to read the number symbols by pointing to numbers on a number line and asking them to say the name. Ask students to match a number card to the same number on the number line.
- **Extending** Show students a number line. Where is number six? What do you know about the number six? Repeat with other numbers.

ESL Activity: How Many?

Use with lesson 1.1

10 minutes

Materials

5 counters

- Arrange four counters on a desk.
- Count the counters as you point to each one and say 4 counters. Have the students make a set of 4, count the set, say the number out loud and then write the symbol.
- Repeat the activity with different numbers of counters.

Additional Needs

Considerations for Additional Needs Students

- Students who have trouble manipulating small materials such as counters or cubes could use larger concrete materials such as big building blocks, soft toys, and other items.
- Students with short-term auditory memory difficulties may take longer to learn the pattern of counting. Give these students the opportunity to practise oral counting daily.
- Students with attention issues may benefit by being physically active outside. Jump six times, hop eight times, clap ten times etc. Encourage the students to count out loud as they do the actions.

Additional Needs Activity: Tactile Numbers

Use with lesson 1.1 and 1.2

15 minutes

Materials

Cards, craft glue, sand (could use sugar, salt or glitter)

- Make a set of number cards with the numbers zero through to ten written in felt pen.
- Students can use craft glue to trace each number and then sprinkle it with sand. Shake off the excess sand and leave to dry overnight.
- Ask students to trace the numbers with their finger.

Research says to give all students access to the same content but level the instruction based on how much support different students need (Cotton, 2001).

Teacher Resource Booklet

Prior knowledge task: allows teachers to plan for differentiation in the classroom.

Problem Solving: open-ended activities. Capable students can be challenged and less-capable students will also be able to come up with an answer.

Topic Engagement Links

The following are suggested as ideas and resources for engaging students with the topic and connecting the concepts to real-life contexts.

Prior Knowledge Task

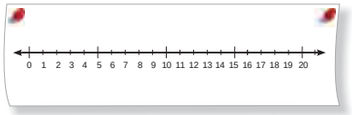
Elicit prior knowledge from students by asking them to:

- **Count** as you can.
- **Write** numbers you know.

Displays

A Number Line

Display a large number line up to 20. Students could also have individual number lines laminated on their tables for constant reference. This would especially support emerging level or additional needs students.



Books

Margaret Mahy, *The King Rides By*, Ashton Scholastic, 1986
This is a cumulative narrative in which the King leads a procession. There are increasing numbers of people and animals in the book that appear in the illustrations but not the text. This book gives students the opportunity to count sets of things up to nine. You could also challenge the students to find out how many altogether?

Helen Oxenbury, *Numbers of Things*, Random House, 1983
Numbers of Things is a picture storybook that uses objects and animals familiar to children as sets to be counted. It begins with one lion and finishes with 50 ladybirds. The numbers one through to 10 are covered, followed by 20, 30, 40 and then 50. This book gives students the opportunity to practise counting sets. You could use the book to reinforce maths vocabulary. **Which group has the most things in it? Which number is one greater than 6?**

Songs and Rhymes

The ants go marching one by one, hurrah, hurrah,
The ants go marching one by one, hurrah, hurrah,
The ants go marching one by one, the little one stops to suck his thumb.
And they all go marching home to get out of the rain.
The ants go marching two by two, etc.

Traditional

One, two, buckle my shoe
Three, four, shut the door,
Five, six, pick up sticks,
Seven, eight, lay them straight.
Nine, ten, let's count again!

Traditional

Games

Physical Number Lines

Give ten students a card each with a number on it (use numbers one through to ten). The students then need to arrange themselves in order to make a physical number line. Variations: Use numbers 11 to 20, ask students to arrange themselves without speaking, choose three numbers and three students and ask them to arrange themselves in order from the smallest number to the largest number (e.g. 5, 12, 19 or 2, 7, 9).

What's the Time, Mr Wolf?

This fun, outside game is a perfect way to encourage students to practise their counting skills. One student is the wolf and stands approximately 10 metres away from the rest of the students who are lined up facing 'the wolf'. The students all yell out 'What's the time, Mr Wolf?' Mr Wolf then yells out a time, e.g. '5 o'clock'. The students then take five steps towards the wolf. When the wolf yells 'dinner time' he chases the students back to the starting line.

Topic engagement links: creative and accessible links are suggested to suit all levels of understanding.

Problem Solving

Students need rich experiences to develop the concept of place value. These include many opportunities to count and record collections using number names and numerals, grouping objects in tens and ones, interpreting and ordering 2-digit numbers and developing mental images of numbers using the number line. Modelling using appropriate manipulative materials will help students develop numeration.

The following information is for use alongside the problem-solving activities in the Student Activity Book.

1:1-1 Counting and Writing Numbers 0 to 5

Answers will vary. Encourage students to represent 5 in as many ways as they can, for example, by using manipulatives, drawings, number sentences, pictures from magazines and word problems. Share and discuss responses.

1:1-2 Counting and Writing Numbers 6 to 10

There are five possibilities. Discuss the strategies students used. Who drew a picture? Who wrote equations? Using 6 counters and systematically lining up the possibilities using 2 colours to represent the friends and then recording the results in a table is a good strategy that should be modelled.

Friend 1	*Friend 2*
1	5
2	4
3	3
4	2
5	1

1:1-3 Counting and Writing Numbers 10, 11, 12

A range of answers is possible. This problem asks for reverse thinking and students often need a lot of practice to think of questions rather than give answers, which is what they are used to. Students usually only think of equations. Encourage them to use their existing knowledge and imagination to think of more than just the obvious answers. For example: **How many in a dozen? How many months in a year? What is the age before you become a teenager? What is half of 24?**

1:1-4 Counting and Writing Numbers 13 to 19

11–19. Responses will indicate whether students know the 'teen' numbers. Encourage the use of number lines for students who are having difficulty. With teen numbers, listen to how students say and write these numbers. Do they know the difference between 13, 30 and 31? Say the numbers. Use counters and ten frames to model the numbers. Then write the numbers on the board. How are they different? Extend the problem by asking, **What is the largest number of oranges I could have? What is the smallest number of oranges I could have?**

1:1-5 Counting and Writing Numbers to 20

There are seven different possibilities. To solve this problem give students cards, either playing cards from a deck or made up cards numbered 1 to 8. Have students produce solutions with four different cards. Students should be encouraged to substitute and look for patterns.

1+ 4 + 7 + 8
1+ 5 + 6 + 8
2 + 3 + 7 + 8
2 + 4 + 6+ 8
3 + 4 + 5 + 8
3 + 4 + 6 + 7
5 + 2 + 6 + 7

1:1-6 Ordering Numbers Using a Number Line

1, 2, 3, 4, 5, 6, 7, 8 or 9. This problem teaches students to think of all possibilities, then eliminate the ones that don't belong with each subsequent clue. Model the strategy by giving all students a number line and some clear counters. Read out the first clue. Students eliminate the counters that have been placed on numbers greater than or equal to 12, and so on, until the numbers 1 to 9 are left. This type of problem is very useful for revising concepts and the language of maths; in this case, 'less than', 'single digit'.

1:1-7 Counting Beyond 20

Multiple responses are possible. Students' responses will reveal their understanding of place value. Extend this problem by asking, **What was the biggest number you thought of?** Record responses; then, as a class, order the numbers. **Which is the biggest, smallest etc?**

1:1-8 Comparing Two Numbers

Answers will vary. Have manipulatives and number lines available for students to solve this problem. Ask students to justify their solutions by telling how they know their solutions are correct. Encourage correct use of comparison language. Did anyone follow a pattern? For example: 1 and 5, 2 and 6, 3 and 7 etc., 11 and 15, 12 and 16, 13 and 17 etc.

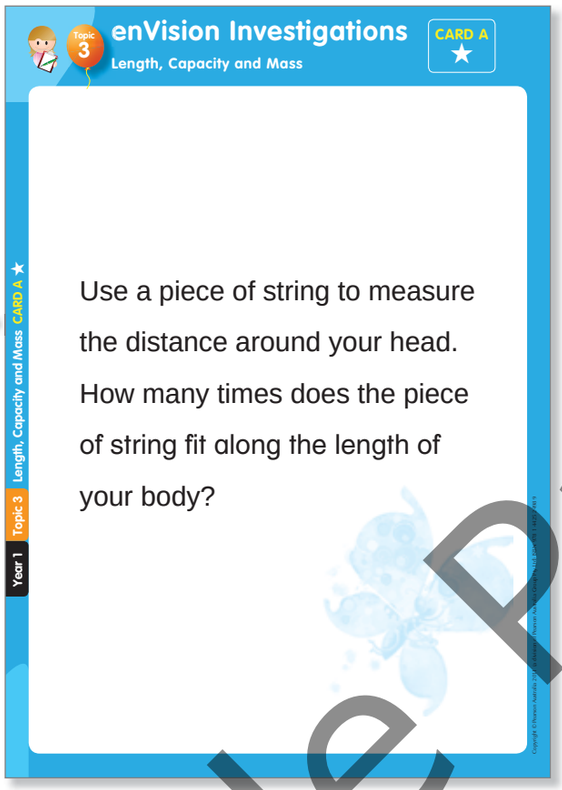
1:1-9 Ordering Three Numbers

This open-ended task has many possibilities. Number lines and number charts would be helpful for students to use. Have they understood the comparison language used in the problem (particularly 'between') and met the conditions of the clues? Have students share and explain their solutions.

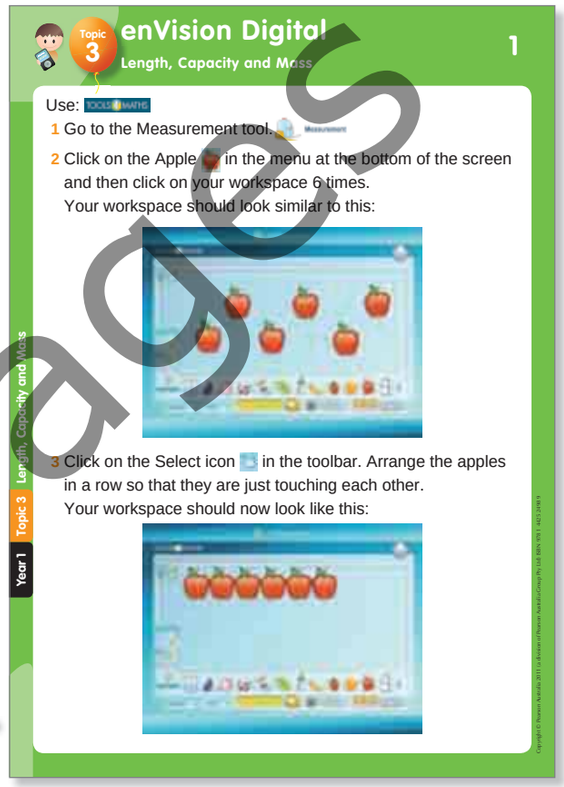
Differentiation

Activity Zone Cards

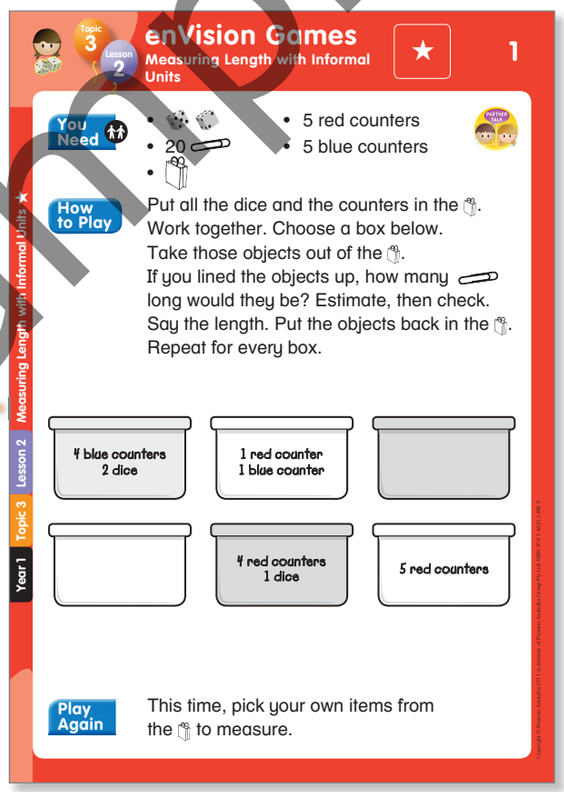
enVision Investigations Cards: provide real-life investigations that are accessible by all levels. They are two-sided, with the first side (★) suitable for all students and the second side (★★) extending the investigation.

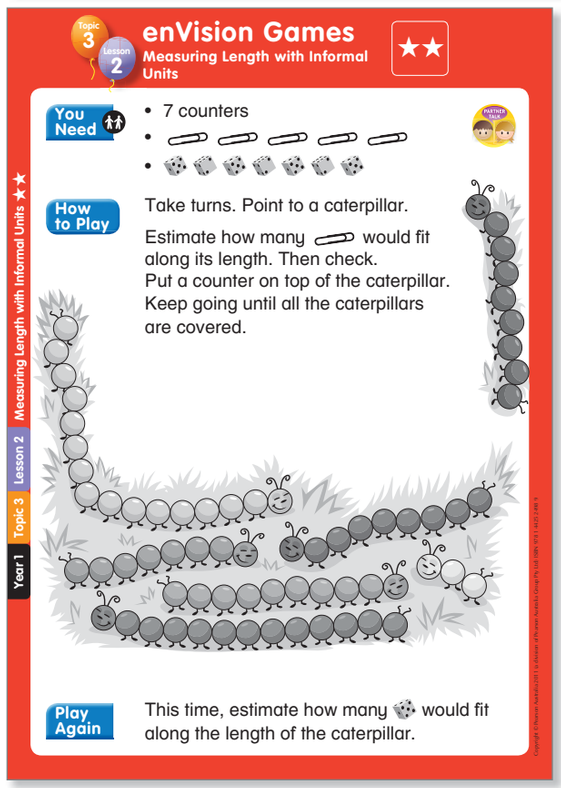


enVision Digital Cards: follow-up tasks are provided to allow the more motivated and capable students to extend the task further. These cards are designed to be used with Tools4Maths.



enVision Games Cards: cards are two-sided, with the first side (★) being suitable for all students and the second side (★★) being an extension.



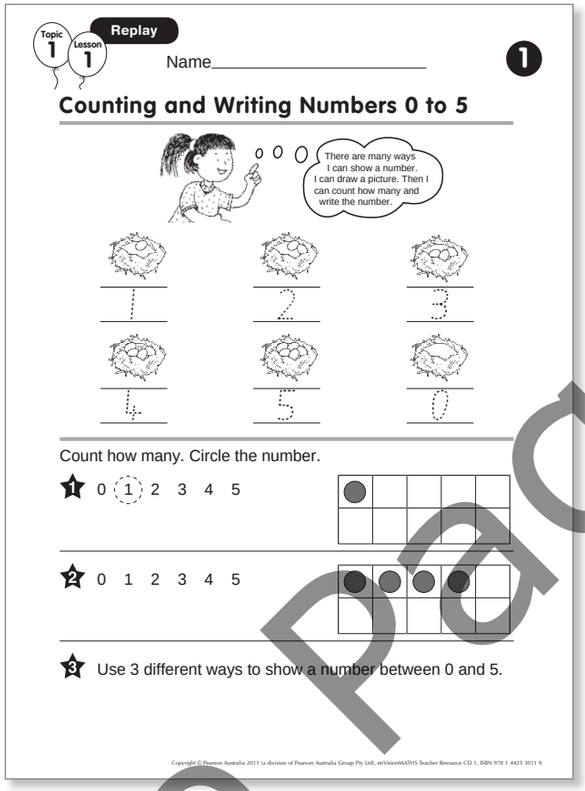


Differentiated Worksheets

Worksheets are provided in PDF format on the Teacher Resource DVD (at the back of this book). A Replay, Practice and Challenge worksheet is provided for each lesson within each topic. These are designed for below-level, at-level and above-level students, with the teacher directing students to the appropriate worksheet. The Replay and Practice worksheets are directly related to the topic. Some of the Challenge worksheets aim to extend the students within the topic while others aim to enrich student learning beyond the topic.

Teachers can use these worksheets in a number of ways, as desired: for homework, extra practice, revision classes etc.

Worksheets for Foundation, year 1 and year 2 are provided on the year 1 Teacher Resource DVD.


Topic 1 Lesson 1 Replay

Name_____ 1

Counting and Writing Numbers 0 to 5

There are many ways I can show a number. I can draw a picture. Then I can count how many and write the number.

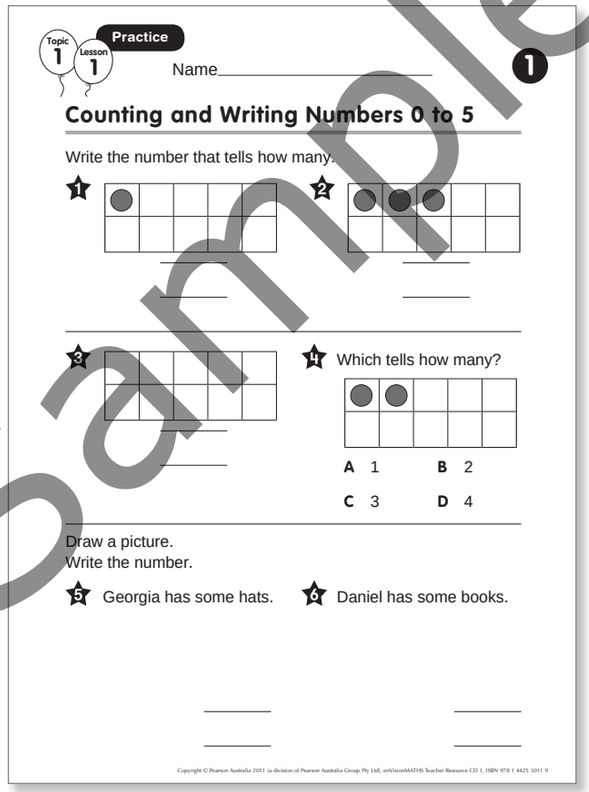
1 2 3 4 5 0

Count how many. Circle the number.

1 0 1 2 3 4 5

2 0 1 2 3 4 5

3 Use 3 different ways to show a number between 0 and 5.


Topic 1 Lesson 1 Practice

Name_____ 1

Counting and Writing Numbers 0 to 5

Write the number that tells how many.

1 2

3 4 Which tells how many?

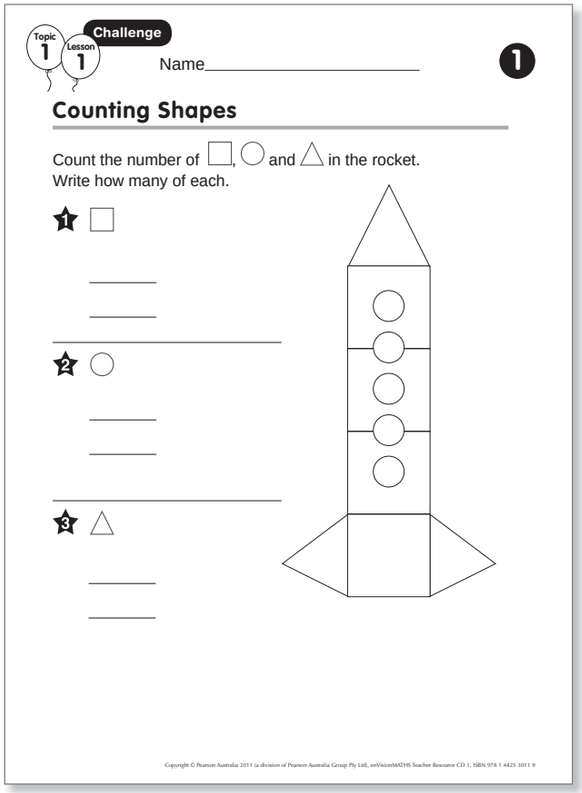
A 1 B 2

C 3 D 4

Draw a picture.
Write the number.

5 Georgia has some hats.

6 Daniel has some books.


Topic 1 Lesson 1 Challenge

Name_____ 1

Counting Shapes

Count the number of □, ○ and △ in the rocket.
Write how many of each.

1 □

2 ○

3 △

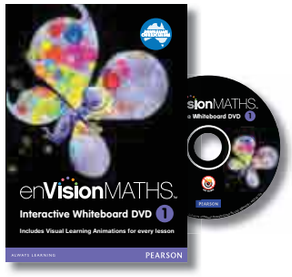
enVisionMATHS Components

enVisionMATHS components cater for the seven year levels of the Australian Curriculum: Mathematics F–6.

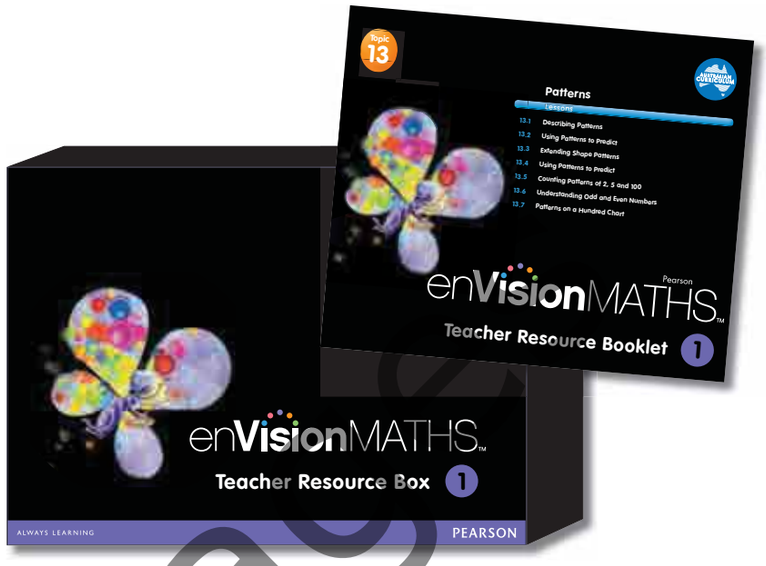
These components can be adapted to all primary maths classrooms around Australia and can be taught in any order.

2012 Release:

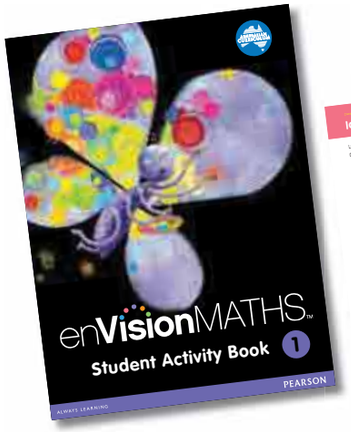
- Teacher Resource Box
- Interactive Whiteboard DVD (including Tools4Maths)
- Student Activity Book
- Activity Zone (Investigations cards, Mental Computation cards, Games cards, Digital cards)
- Maths Thinking Skills Book.



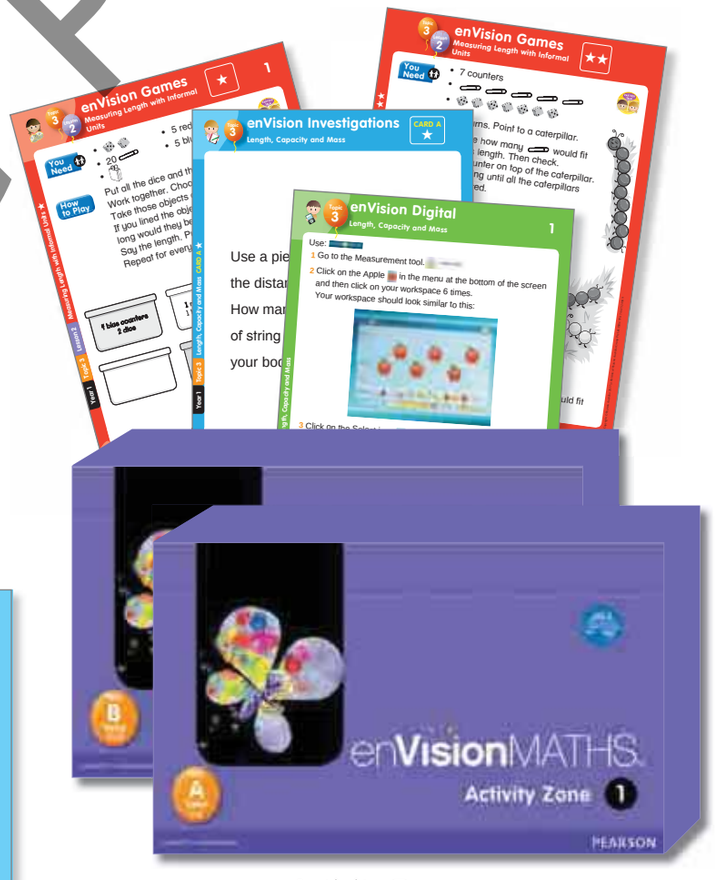
Interactive Whiteboard DVD



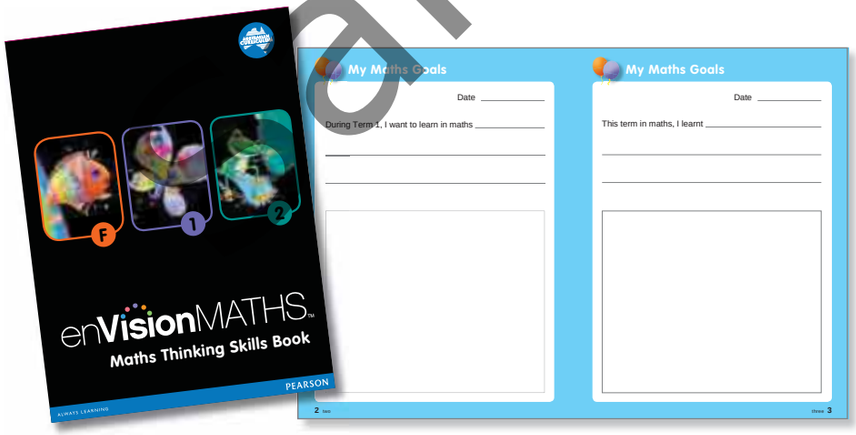
Teacher Resource Box



Student Activity Book

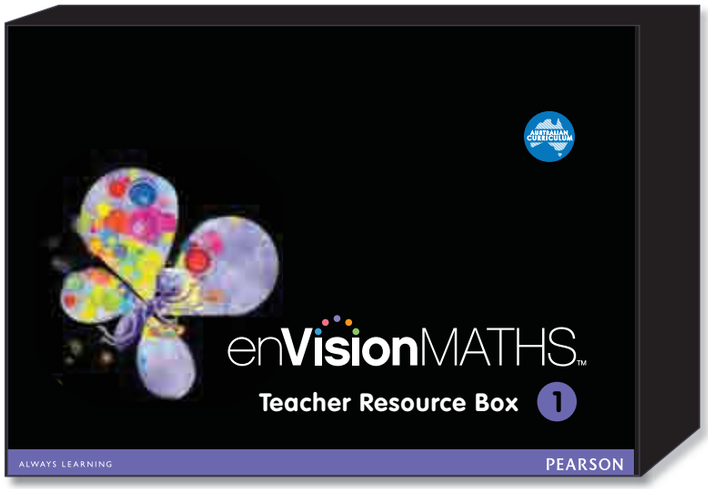


Activity Zone



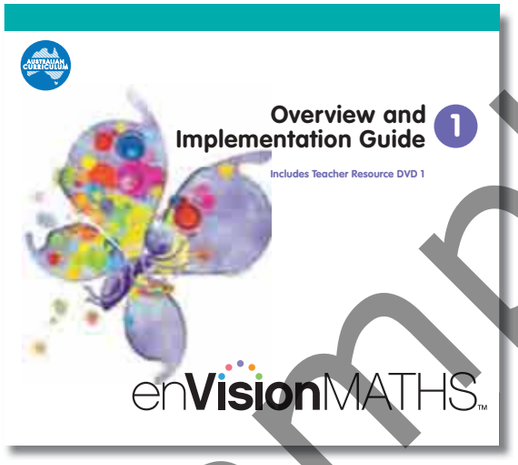
Maths Thinking Skills Book

Teacher Resource Box



Overview and Implementation Guide

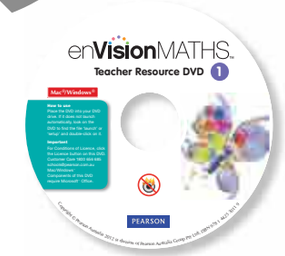
The Overview and Implementation Guide provides the outline of the program for each year level, together with program implementation guidance.



Teacher Resource DVD

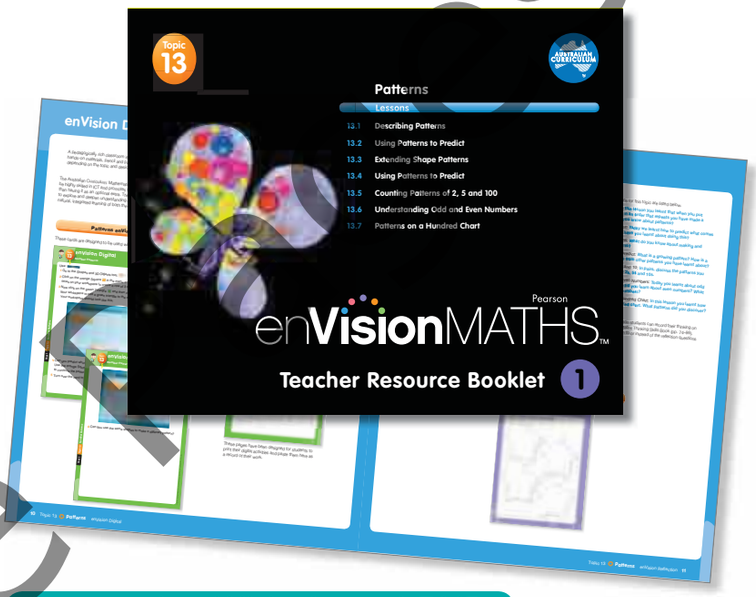
The Teacher Resource DVD is in the back of this Overview and Implementation Guide.

The year 1 DVD contains Differentiated Worksheets; Visual Learning Bridges; Interview, Pre- and Post-assessments; and editable teacher planning and recording documents for years F, 1 and 2.



Teacher Resource Booklets

The Teacher Resource Booklets are presented in the Teacher Resource Box for protection and portability. For year 1, the box includes 13 colour-coded topic booklets (and the Overview and Implementation Guide). Each booklet contains the planning and assessment information and tools necessary to implement each topic of the program. Each booklet also includes reduced-sized copies of all components for the topic so that when working away from school, teachers need only take a lightweight booklet with them for their planning.



Interactive Whiteboard DVD

The Interactive Whiteboard DVD includes captivating animations (VLAs) which assist teachers to explicitly teach the underlying mathematical concepts in each topic. The Visual Learning Bridges (VLBs) are also on this DVD. These link each of the important maths concepts to result in a deep conceptual understanding for students. For year 1 there are 86 VLAs and VLBs.

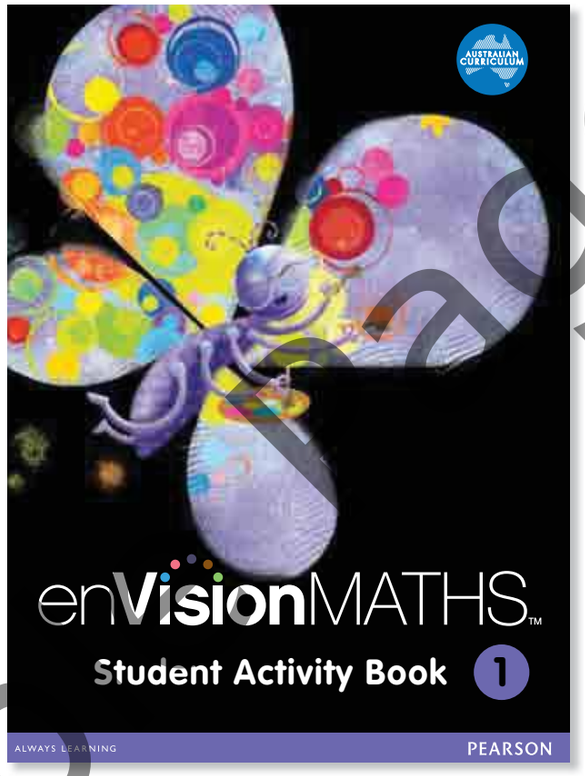
The DVD also includes Tools4Maths—a set of digital maths tools for student or class use on PCs or the whiteboard.

enVisionMATHS Components

Student Activity Book

The Student Activity Book at each year level allows for furthering conceptual understanding, building fluency, reasoning, mental computation and open-ended problem solving. The Student Activity Books are full colour and make extensive use of engaging visual-learning strategies.

The Student Activity Book for year 1 covers 13 topics and 86 lessons.



Activity Zone

The Activity Zone for year 1 comprises two boxes of sturdy, laminated cards that are designed to promote interaction between students and to make their maths learning meaningful and enjoyable. Box A contains the cards for topics 1 to 6 and Box B contains the cards for topics 7 to 13.

The year 1 Activity Zone provides 41 Investigations cards, 86 Games cards and 13 Digital cards. Each card is colour-coded and topic-based and opportunities for differentiation have been embedded by levelling the games. Students can record their responses to these cards in the Maths Thinking Skills Book.

There are four copies of each card provided in the Activity Zone boxes. The boxes also include sturdy topic dividers that clearly show the topic name and number and how many cards belong with that topic. In some cases, boxes may arrive with the dividers and cards wrapped separately; if so, the cards will need to be collated into their appropriate topics.

Maths Thinking Skills Book

The Maths Thinking Skills Book is aligned directly to the card activities in the Activity Zone. It provides opportunities for students to record their maths thinking in areas such as games strategies, investigations and reflection. This book provides teachers, students and parents with a valuable portfolio of a student's mathematical thinking and goals for that year's work.

There is one book suitable for use in years F, 1 and 2, and another book suitable for use in years 3, 4, 5 and 6.

How is enVisionMATHS Different?

enVisionMATHS combines modular, print-based teaching resources with breakthrough digital teaching and learning tools. This fully integrated combination of print and digital teaching tools makes **enVisionMATHS** different to other Australian primary mathematics programs.

The use of Visual Learning Bridges and instructional animations is unique to the program and provides for deep conceptual understanding of maths in accordance with the aims of the Australian Curriculum.

- **enVisionMATHS** is a complete program containing all that is needed to provide a variety of learning experiences and differentiation across F to 6. This breadth and the inclusion of elements such as the IWB DVD, Activity Zone and Maths Thinking Skills Book differentiates it from the usual Activity Book and Teacher's Guide of other maths programs. This multi-component approach makes it easier for teachers to find relevant content, and broadens students' experiences by giving them a greater range of materials to work with.
- Everything is organised around topics and everything connects: Teacher support → VLA → Student Book → Activity Zone → Maths Thinking Skills Book→ Differentiated Worksheets → Assessment. (This is a different approach to series that take items which were conceived and developed separately then place them together as programs.)
- The Activity Zone and Maths Thinking Skills Book pairing is unique.
- **enVisionMATHS** gives students a voice by providing many opportunities for students to discuss, work in groups and reflect.

enVisionMATHS delivers a truly flexible and comprehensive program through its multi-component but straightforward structure and in-built differentiation and assessment.

enVisionMATHS™

enVisionMATHS and the Australian Curriculum

enVisionMATHS is aligned with the Australian Curriculum: Mathematics content and proficiency strands.

Throughout all the **enVisionMATHS** components, the following colours have been allocated to the three Australian Curriculum: Mathematics content strands:

Number and Algebra
Measurement and Geometry
Statistics and Probability

These colours show at a glance which strand is being focused on and provide clear links to the curriculum.

The four Australian Curriculum proficiency strands (Understanding, Fluency, Problem solving and Reasoning) are embedded throughout the **enVisionMATHS** program and are specifically addressed as follows and as displayed below.

- Understanding (build and apply knowledge, make connections): use of Visual Learning Animations and Bridges to explain maths concepts; Investigations cards
- Fluency (develop skills in applying appropriate procedures, recall and apply facts and concepts; becoming a mathematician): Guided and Independent practice in Student Activity Books, Mental computation, Tools4Maths
- Problem-solving (make choices, interpret, model, communicate): open-ended problem-solving for every lesson in the Student Activity Books; Investigations and Games cards
- Reasoning (reason mathematically by analysing, proving, evaluating, explaining, inferring, justifying and generalising): Reasoning activities are explicit on Student Activity Book pages and in the Maths Thinking Skills Book.

All aspects of these Australian Curriculum content and proficiency strands are included in the Interview Assessment and Diagnostic Pre-and Post-assessments designed for each topic.

enVisionMATHS also encourages and aids the implementation of the Australian Curriculum's overarching aim of inquiry and active participation and puts in place the means to develop general capabilities.

The seven general capabilities are 'The skills, behaviours and attributes that students need to succeed in life and work in the twenty-first century'. Teachers will be asked to incorporate the general capabilities into their planning. This is how **enVisionMATHS** will help:

- Literacy: focus on vocabulary (page 4 of any Teacher Booklet), use of Maths Thinking Skills Books, viewing and responding to Visual Learning Animations, reading and understanding problems and investigations
- Numeracy: evident in **enVisionMATHS** content and in working through problems, investigations, use of Maths Thinking Skills Book.
- Competence in information and communication technology: exploration and use of Tools4Maths
- Critical and creative thinking: evident in problem-solving and investigations
- Ethical behaviour: evident in selecting and interpreting data
- Personal and social competence: evident in real-life understandings such as timetables, financial maths; working in groups
- Intercultural understanding: evident in Topic Openers in years 3 to 6, which give real-life maths contexts from around the world.

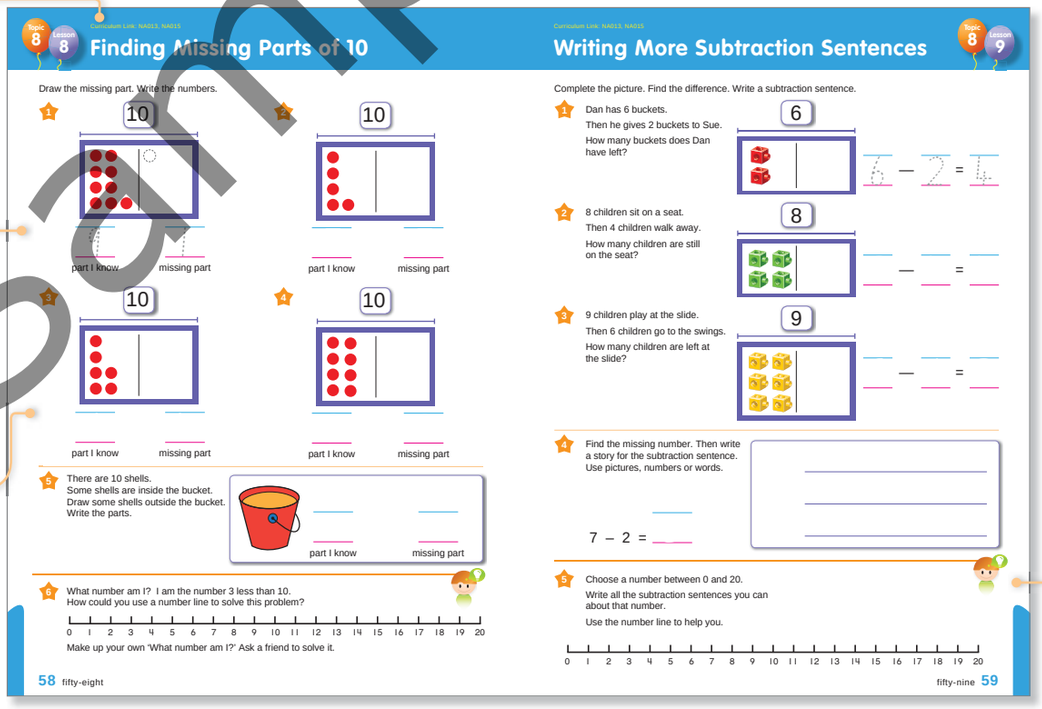
Students are encouraged to take responsibility for their own learning in maths and to work collaboratively in teams.

Activities relevant to the three cross-curriculum priorities in the Australian Curriculum (Aboriginal and Torres Strait Islander histories and cultures; Asia and Australia's engagement with Asia; and Sustainability) are embedded throughout **enVisionMATHS**. The Australian Curriculum: Mathematics identifies which content descriptions best lend themselves to these priorities.

Australian Curriculum Link

Fluency: addressed through the many different components attached to each topic and lesson.

Reasoning: embedded in lessons and games.



Understanding: Visual Learning Bridges enhance conceptual understanding.

Problem Solving: sections appear in each lesson and involve open-ended problem solving.

Research and Development

Extensive research has informed the development of **enVisionMATHS**.

Australian Research Phase

Period	Action
early 2009	Analysis of existing enVision components to determine suitability in Australian environment, conducted by Pearson Australia Primary Maths publishing team
early 2009	Workshop led by Pearson Australia Primary Maths publishing team together with Catherine Pearn (University of Melbourne) and Heidi-Lee Reitsma (Queensland) to formulate list of topics for each year level in line with current Australian teaching practices across the Australian states and early information on shape of maths in the Australian Curriculum
mid-2009	Extensive interviews with Australian primary teachers to verify findings
throughout 2009	Substantial changes formulated for Australia including (but not limited to) introduction of new components Maths Thinking Skills Books and Activity Zones (including investigations and mental computation strategy cards); realignment of topics and year levels; change to more open-ended problem-solving approach and appointment of writer to provide a problem-solving strand across the year levels; change to scrapbook-size workbooks for F–2
November 2009	Workshop with Paul Swan, Linda Marshall, Catherine Attard, Linda Flanagan, Deborah Vietri, Jennifer Saunders, Terri Bullock, Carmen Morgan, Heidi-Lee Reitsma, John Sandy, Greg Thomas and Nicole Morrison to review instructional design and commission writers
October 2009–September 2010	Continual consultation and revision over Australian writing phase
March 2010	Phase 1 revision based on Australian Curriculum draft
June 2010	Focus group with primary teachers to problem-solve on draft
November 2010	Assessment pathway revised
December 2010–July 2011	Phase 2 revision based on Australian Curriculum
2011	Reports from pilot schools in Australia will inform future refinements

Original Research Phase

Four distinct phases of research were integrated into the development of the original enVision program in the US.

Phase 1 ✪ Ongoing research

Ongoing research with existing Pearson programs (such as Scott Foresman Mathematics, Scott Foresman/Addison Wesley Math and Silver Burdett Ginn Mathematics programs) provides a strong basis for success. Scores on standardised tests as well as longitudinal studies prove these programs help raise maths scores.

Phase 2 ✪ Scientific research base

An experienced authorship team incorporated findings from the large body of available scientific research to develop the instructional and assessment tools.

Phase 3 ✪ Formative research

As the program was designed, valuable input was contributed by classroom field studies, as well as leading mathematicians, administrators, teachers and reviewers. Pre- and post-test scores proved we were on track.

Phase 4 ✪ Summative research

Ongoing scientific research, including longitudinal studies in the classroom, further validates the program's effectiveness and supports the commitment to producing the highest quality mathematics materials.

A Research Study

PRES Associates, an independent research firm, conducted a longitudinal randomised control trial study to assess the effectiveness of **enVisionMATH** in helping students attain critical maths skills. The study commenced in 2007–8 with 2nd and 4th grade students and followed these students into 3rd and 5th grades in 2008–9. The final sample comprised 708 students who participated in both years of the study. Fifty-six teachers participated in the first year of the study, and forty-four participated in the second year. The participating schools represented suburban and rural communities from eight US states.

Successful Results with enVisionMATH

Students of all ability levels using **enVisionMATH** demonstrated significantly greater improvement than students using other maths programs in the areas of: Maths Computation, Problem Solving and Maths Communication.

Furthermore, the data suggests that increased student and teacher exposure to **enVisionMATH** produces stronger effects with the rate of growth becoming more pronounced in the second year of usage.

Suggested Teaching Sequence

enVisionMATHS provides a flexible sequence with topics that are organised and colour coded by content strand, and which are small enough to be rearranged into a personalised curriculum that matches the preferred sequence of a class/school.

The key to the implementation of **enVisionMATHS** in the classroom is the sequencing of the program elements. A suggested teaching sequence is provided below.

Topic

- Plan lesson (using Teacher Resource Booklet, pages 2–11).
- Introduce topic using topic engagement links (Teacher Resource Booklet, page 6).
- Administer diagnostic pre-assessment to students (by concept).
- Interview assessment with students.

Lessons

- Introduce each lesson by setting the purpose.
- Watch the Visual Learning Animation (VLA) and show students the Visual Learning Bridge on the Interactive Whiteboard or as a printed copy to support students in understanding the concept.
- Whole-class teaching focus: Consolidate the concept and include problem solving.
- Students complete activity in Student Activity Book.
- Small group work: Work with students who need further instruction (error intervention, extension) while rest of class work in groups on differentiated learning centre activities from the Activity Zone that are appropriate to their level, recording their work in their Maths Thinking Skills Book.
- Whole-class reflection.
- Students record reflections in the Maths Thinking Skills Book.
- Students do extra practice at home or school using Differentiated Worksheets.

Assessment

- Ongoing and throughout: Use assessment pages from the **enVisionMATHS** Teacher Resource Booklet and DVD, observations and recorded work in Maths Thinking Skills Book.
- Administer diagnostic post-assessment to students (by concept).

Note: Teachers are free to adapt this sequence to best suit their classes.

How Long Does a Topic or Lesson Take to Do?

Year 1 has 86 lessons across 13 topics. The topics range from 3 to 10 lessons. A lesson would take about 2 hours (two 1-hour blocks), so about 2 to 3 lessons could be covered in a week. A topic would therefore range from nearly 2 weeks for the shortest to about 4 weeks for the longest, with those with an average 6 to 8 lessons taking 2 to 3 weeks each including time needed for assessment.

In summary:

A lesson = 2 hours
A topic = average 3 weeks
13 Topics × 3 weeks = 39 weeks

See pages 26–38 for an approximate time allocation per topic.

The year 1 Teacher Resource DVD (at the back of this book) includes editable planning documents related to years F, 1 and 2 to assist with planning **enVisionMATHS** work throughout the year.

These planning documents are simple, flexible Microsoft® Excel® spreadsheets. They match Australian Curriculum strands and substrands to **enVisionMATHS** lessons, and provide the relevant Student Book and Teacher Booklet page references for each lesson. Other columns in the spreadsheet are left blank for teachers to use as they wish.

In developing **enVisionMATHS**, it was recognised that teachers need to fit in with their whole-school planning, so there is no prescribed sequence. The suggested teaching sequence can be used as a guide but the program has been designed to be flexible and can be implemented as a whole-class program or used with different ability groups.

Note that the Student Activity Books do not include extensive practice examples. The program focuses on understanding concepts and enrichment while providing the flexibility for teachers to introduce their own practice examples through the use of Differentiated Worksheets, if they wish.

The year 1 contents sequence on pages 26–38 provides an at-a-glance view of the program's components and suggested resources for each topic.

Year 1 Planning Document

Australian Curriculum Reference	**enVisionMATHS** Student Activity Book year 1	SAB 1* (page)	TRB 1* (booklet: page)
NUMBER AND ALGEBRA			
Number and place value			
NA012 Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero	**1.1** Counting and Writing Numbers 0 to 5	1	1:12
	1.2 Counting and Writing Numbers 6 to 10	2	1:14
	1.3 Counting and Writing Numbers 10, 11, 12	3	1:16
	1.4 Counting and Writing Numbers 13 to19	4	1:18
	1.5 Counting and Writing Numbers to 20	5	1:20
	1.6 Ordering Numbers Using a Number Line	6	1:22
	1.7 Counting Beyond 20	7	1:24
	1.8 Comparing Two Numbers	8	1:26
	1.9 Ordering Three Numbers	9	1:28
	4.1 Representing Numbers on a Ten Frame	22	4:12
	4.2 Understanding Parts of 10	23	4:14
	9.2 Identifying One More, One Less	61	9:14
	9.3 Counting to 100	62	9:16
	9.4 Comparing Numbers	63	9:18
	9.5 Identifying Before, After and Between	64	9:20
	9.6 Ordering Numbers on a Number Line	65	9:22
	12.1 Identifying Groups (extension NA031)	77	12:12
	12.2 Using Groups of 2, 5 and 10 (extension NA031)	78	12:14
	12.3 Understanding Division as Sharing (extension NA032)	79	12:16
	13.5 Counting Patterns of 2, 5 and 10	84	13:20
	13.6 Understanding Odd and Even Numbers	85	13:22
	13.7 Identifying Patterns on a Hundred Chart	86	13:24
NA013 Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line	**1.1** Counting and Writing Numbers 0 to 5	1	1:12
	1.2 Counting and Writing Numbers 6 to 10	2	1:14
	1.3 Counting and Writing Numbers 10, 11, 12	3	1:16
	1.4 Counting and Writing Numbers 13 to 19	4	1:18
	1.5 Counting and Writing Numbers to 20	5	1:20
	1.6 Ordering Numbers Using a Number Line	6	1:22
	1.7 Counting Beyond 20	7	1:24
	1.8 Comparing Two Numbers	8	1:26
	1.9 Ordering Three Numbers	9	1:28
	2.7 Making Numbers in Different Ways	16	2:24
	4.1 Representing Numbers on a Ten Frame	22	4:12
	4.2 Understanding Parts of 10	23	4:14

* SAB 1 = **enVisionMATHS** Student Activity Book Year 1, TRB 1 = **enVisionMATHS** Year 1 Teacher Resource Booklets

(cont.)

	4.4 Using Numbers with 10s and 1s	25	4:18
	4.5 Counting with 10s and 1s	26	4:20
	4.6 Writing Numbers in Different Ways	27	4:22
	5.1 Counting On	30	5:12
	8.6 Finding Missing Parts of 8	56	8:22
	8.7 Finding Missing Parts of 6 and 7	57	8:24
	8.8 Finding Missing Parts of 10	58	8:26
	8.9 Writing More Subtraction Sentences	59	8:28
	9.1 Making Numbers to 100	60	9:12
	9.2 Identifying One More, One Less	61	9:14
	9.3 Counting to 100	62	9:16
	9.4 Comparing Numbers	63	9:18
	9.5 Identifying Before, After and Between	64	9:20
	9.6 Ordering Numbers on a Number Line	65	9:22
	13.6 Understanding Odd and Even Numbers	85	13:22
	13.7 Identifying Patterns on a Hundred Chart	86	13:24
NA014 Count collections to 100 by partitioning numbers using place value	**1.4** Counting and Writing Numbers 13 to 19	4	1:18
	1.5 Counting and Writing Numbers to 20	5	1:20
	1.7 Counting Beyond 20	7	1:24
	4.2 Understanding Parts of 10	23	4:14
	4.3 Using Numbers Made with 10s	24	4:16
	4.4 Using Numbers with 10s and 1s	25	4:18
	4.5 Counting with 10s and 1s	26	4:20
	4.6 Writing Numbers in Different Ways	27	4:22
	5.6 Showing Addition Facts on a Ten Frame	35	5:22
	5.7 Making 10 on a Ten Frame	36	5:24
	5.8 Making 10 to Add 9	37	5:26
	9.1 Making Numbers to 100	60	9:12
	9.3 Counting to 100	62	9:16
	9.4 Comparing Numbers	63	9:18
NA015 Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts	**1.2** Counting and Writing Numbers 6 to 10	2	1:14
	2.1 Drawing Addition Stories	10	2:12
	2.2 Adding to 6 and 7	11	2:14
	2.3 Adding to 8 and 9	12	2:16
	2.4 Using the Plus Sign	13	2:18
	2.5 Writing Addition Number Sentences	14	2:20
	2.6 More Addition Number Sentences	15	2:22
	2.7 Making Numbers in Different Ways	16	2:24
	5.1 Counting On	30	5:12
	5.2 Adding 1 More	31	5:14
	5.3 Adding Doubles	32	5:16
	5.4 Using Near Doubles to Add	33	5:18
	5.5 Adding More Near Doubles	34	5:20
	5.6 Showing Addition Facts on a Ten Frame	35	5:22
	5.7 Making 10 on a Ten Frame	36	5:24
	5.8 Making 10 to Add 9	37	5:26
	5.9 Adding Three Numbers	38	5:28
	5.10 Adding with 0	39	5:30
	8.1 Using the Minus Sign	51	8:12
	8.2 Finding Difference	52	8:14
	8.3 Writing Subtraction Sentences	53	8:16
	8.4 Understanding Comparison Stories	54	8:18
	8.5 Subtracting with 0, 1 and 2	55	8:20
	8.6 Finding Missing Parts of 8	56	8:22
	8.7 Finding Missing Parts of 6 and 7	57	8:24
	8.8 Finding Missing Parts of 10	58	8:26
	8.9 Writing More Subtraction Sentences	59	8:28

Fractions and decimals			
NA016 Recognise and describe one-half as one of two equal parts of a whole	**10.1** Folding in Half	66	10:12
	10.2 Making Equal Parts	67	10:14
	10.3 Identifying Half of a Group	68	10:16
	10.4 Using Different Attributes to Find Half	69	10:18
	10.5 Making a Whole	70	10:20
Money and financial mathematics			
NA017 Recognise, describe and order Australian coins according to their value	**4.7** Identifying Features and Values of Coins	28	4:24
	4.8 Recognising the Values of Coins	29	4:26
	13.5 Counting Patterns of 2, 5 and 10	84	13:20
Patterns and algebra			
NA018 Investigate and describe number patterns formed by skip counting and patterns with objects	**9.3** Counting to 100	62	9:16
	9.4 Comparing Numbers	63	9:18
	9.6 Ordering Numbers on a Number Line	65	9:22
	13.1 Describing Patterns	80	13:12
	13.2 Using Patterns to Predict	81	13:14
	13.3 Extending Shape Patterns	82	13:16
	13.4 Using More Patterns to Predict	83	13:18
	13.7 Identifying Patterns on a Hundred Chart	86	13:24
MEASUREMENT AND GEOMETRY			
Using units of measurement			
MG019 Measure and compare the lengths and capacities of pairs of objects using uniform informal units	**3.1** Comparing and Ordering Length	17	3:12
	3.2 Measuring Length with Informal Units	18	3:14
	3.3 Estimating and Measuring Length	19	3:16
	3.4 Comparing and Ordering Capacity	20	3:18
	3.5 Comparing and Ordering Mass	21	3:20
MG020 Tell time to the half-hour	**7.3** Understanding Hour and Minute Hands	47	7:16
	7.4 Telling and Writing Time to the Hour	48	7:18
	7.5 Telling and Writing Time to Half an Hour	49	7:20
MG021 Describe duration using months, weeks, days and hours	**7.1** Estimating and Ordering Time Lengths	45	7:12
	7.2 Understanding Times of Events	46	7:14
	7.4 Telling and Writing Time to the Hour	48	7:18
	7.5 Telling and Writing Time to Half an Hour	49	7:20
Shape			
MG022 Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features	**6.1** Understanding Properties of 2D Shapes	40	6:12
	6.2 Identifying 2D Shapes	41	6:14
	6.3 Understanding Orientation of Shapes	42	6:16
	6.4 Identifying 3D Objects	43	6:18
	6.5 Sorting 3D Objects	44	6:20
Location and transformation			
MG023 Give and follow directions to familiar locations	**7.6** Giving and Following Directions	50	7:22
STATISTICS AND PROBABILITY			
Chance			
SP024 Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen'	**11.4** Identifying What Will, Won't or Might Happen	74	11:18
	11.5 Identifying More Likely	75	11:20
	11.6 Identifying Certain or Impossible	76	11:22
Data representation and interpretation			
SP262 Choose simple questions and gather responses	**11.1** Collecting Data	71	11:12
SP263 Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays	**11.1** Collecting Data	71	11:12
	11.2 Making Graphs with Objects	72	11:14
	11.3 Understanding Data	73	11:16

Topic 1

Year 1 Contents Sequence

Suggested time: 4 weeks

Topic

Numbers and Place Value to and Beyond 20

How old are you?
Do you know how old teenagers are?
In this topic you will learn more about tricky teen numbers.

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 1

Interview Assessment: Topic 1

Lessons

Year 1 ✪ Topic 1 ✪ Numbers and Place Value to and Beyond 20

	Lesson	SAB* page	TRB* page
1.1	Counting and Writing Numbers 0 to 5	1	12
1.2	Counting and Writing Numbers 6 to 10	2	14
1.3	Counting and Writing Numbers 10, 11, 12	3	16
1.4	Counting and Writing Numbers 13 to 19	4	18
1.5	Counting and Writing Numbers to 20	5	20
1.6	Ordering Numbers Using a Number Line	6	24
1.7	Counting Beyond 20	7	22
1.8	Comparing Two Numbers	8	26
1.9	Ordering Three Numbers	9	28

Activity Zone 1
Digital Card 1
Games Cards 1.1–1.9 (★ and ★★)
Investigations Cards 1A, 1B

Interactive Whiteboard DVD 1
Visual Learning Bridges 1.1–1.9
Visual Learning Animations 1.1–1.9
Tools4Maths: Counters; Place-value Blocks

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 1 lessons 1–9

AC Links
NA012, NA013, NA014, NA015

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 1

Ongoing assessment ● Diagnostic Post-assessment: Topic 1

Suggested time: 3 weeks

Topic

Addition Concepts

People often add numbers together in maths.
They want to know how many things there are in total.
It all adds up to an important topic!

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 2

Interview Assessment: Topic 2

Lessons

Year 1 ✪ Topic 2 ✪ Addition Concepts

Lesson		SAB* page	TRB* page
2.1	Drawing Addition Stories	10	12
2.2	Adding to 6 and 7	11	14
2.3	Adding to 8 and 9	12	16
2.4	Using the Plus Sign	13	18
2.5	Writing Addition Number Sentences	14	20
2.6	More Addition Number Sentences	15	22
2.7	Making Numbers in Different Ways	16	24

Activity Zone 1
Digital Card 2
Games Cards 2.1–2.7 (★ and ★★)
Investigations Cards 2A, 2B

Interactive Whiteboard DVD 1
Visual Learning Bridges 2.1–2.7
Visual Learning Animations 2.1–2.7
Tools4Maths: Notepad, Counters

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 2 lessons 1–7

AC Links
NA013, NA015

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 2

Ongoing assessment ● Diagnostic Post-assessment: Topic 2

Topic 3

Year 1 Contents Sequence

Suggested time: 2 weeks

Topic

Length, Capacity and Mass

This topic is all about measuring.
Do you know how long your foot is?
Do you know if your pencil or book is heavier?
Are all big things heavy?

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 3

Interview Assessment: Topic 3

Lessons

Year 1 ✪ Topic 3 ✪ Length, Capacity and Mass

Lesson		SAB* page	TRB* page
3.1	Comparing and Ordering Length	17	12
3.2	Measuring Length with Informal Units	18	14
3.3	Estimating and Measuring Length	19	16
3.4	Comparing and Ordering Capacity	20	18
3.5	Comparing and Ordering Mass	21	20

Activity Zone 1
Digital Card 3
Games Cards 3.1–3.5 (★ and ★★)
Investigations Cards 3A, 3B, 3C, 3D, 3E

Interactive Whiteboard DVD 1
Visual Learning Bridges 3.1–3.5
Visual Learning Animations 3.1–3.5
Tools4Maths: Measurement

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 3 lessons 1–5

AC Links
MG019

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 3

Ongoing assessment ● Diagnostic Post-assessment: Topic 3

Suggested time: 3.5 weeks

Topic

Place Value 10s and 1s and Money

**We often count in tens or to the nearest ten.
Our number system is based on tens. This topic will help you learn more about counting. Our money system is also based on tens.
Here you will learn all about our coins.**

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 4

Interview Assessment: Topic 4

Lessons

Year 1 ✪ Topic 4 ✪ Place Value 10s and 1s and Money

Lesson		SAB* page	TRB* page
4.1	Representing Numbers on a Ten Frame	22	12
4.2	Understanding Parts of 10	23	14
4.3	Using Numbers Made With 10s	24	16
4.4	Using Numbers with 10s and 1s	25	18
4.5	Counting with 10s and 1s	26	20
4.6	Writing Numbers in Different Ways	27	22
4.7	Identifying Features and Values of Coins	28	24
4.8	Recognising the Values of Coins	29	26

Activity Zone 1
Digital Card 4
Games Cards 4.1–4.8 (★ and ★★)
Investigations Cards 4A and 4B

Interactive Whiteboard DVD 1
Visual Learning Bridges 4.1–4.8
Visual Learning Animations 4.1–4.8
Tools4Maths: Counters, Place-value Blocks, Money

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 4 lessons 1–8

AC Links
NA012, NA013, NA014, NA017

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 4

Ongoing assessment ● Diagnostic Post-assessment: Topic 4

Topic 5

Year 1 Contents Sequence

Suggested time: 4 weeks

Topic

Addition Strategies

Adding is so important, we are adding another set of lessons! This topic will teach you addition facts to help you add quickly in your head.

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 5

Interview Assessment: Topic 5

Lessons

Year 1 ✪ Topic 5 ✪ Addition Strategies

Lesson		SAB* page	TRB* page
5.1	Counting On	30	12
5.2	Adding 1 More	31	14
5.3	Adding Doubles	32	16
5.4	Using Near Doubles to Add	33	18
5.5	Adding More Near Doubles	34	20
5.6	Showing Addition Facts on a Ten Frame	35	22
5.7	Making 10 on a Ten Frame	36	24
5.8	Making 10 to Add 9	37	26
5.9	Adding Three Numbers	38	28
5.10	Adding With 0	39	30

Activity Zone 1

Digital Card 5

Games Cards 5.1–5.10 (★ and ★★)

Investigations Cards 5A, 5B, 5C, 5D

Interactive Whiteboard DVD 1

Visual Learning Bridges 5.1–5.10

Visual Learning Animations 5.1–5.10

Tools4Maths: Counters, Place-value Blocks

Teacher Resource DVD 1

Replay, Practice, Challenge Worksheets Year 1 Topic 5 lessons 1–10

AC Links

NA013, NA014, NA015

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 5

Ongoing assessment ● Diagnostic Post-assessment: Topic 5

Suggested time: 2 weeks

Topic

Shapes and Objects

You know the names of shapes and how to draw them. Do you know how to move them around so they are the same?

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 6

Interview Assessment: Topic 6

Lessons

Year 1 ✪ Topic 6 ✪ Shapes and Objects

Lesson		SAB* page	TRB* page
6.1	Understanding Properties of 2D Shapes	40	12
6.2	Identifying 2D Shapes	41	14
6.3	Understanding Orientation of Shapes	42	16
6.4	Identifying 3D Objects	43	18
6.5	Sorting 3D Objects	44	20

Activity Zone 1

Digital Card 6

Games Cards 6.1–6.5 (★ and ★★)

Investigations Cards 6A ,6B, 6C, 6D, 6E

Interactive Whiteboard DVD 1

Visual Learning Bridges 6.1–6.5

Visual Learning Animations 6.1–6.5

Tools4Maths: Shapes and 3D Objects

Teacher Resource DVD 1

Replay, Practice, Challenge Worksheets Year 1 Topic 6 lessons 1–5

AC Links

MG022

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 6

Ongoing assessment ● Diagnostic Post-assessment: Topic 6

Topic 7

Year 1 Contents Sequence

Suggested time: 2.5 weeks

Topic

Time and Location

This topic is all about understanding time and location words like clockwise and anticlockwise to give directions.

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 7

Interview Assessment: Topic 7

Lessons

Year 1 ✪ Topic 7 ✪ Time and Location

Lesson		SAB* page	TRB* page
7.1	Estimating and Ordering Time Lengths	45	12
7.2	Understanding Times of Events	46	14
7.3	Understanding Hour and Minute Hands	47	16
7.4	Telling and Writing Time to the Hour	48	18
7.5	Telling and Writing Time to Half an Hour	49	20
7.6	Giving and Following Directions	50	22

Activity Zone 1
Digital Card 7
Games Cards 7.1–7.6 (★ and ★★)
Investigations Cards 7A, 7B

Interactive Whiteboard DVD 1
Visual Learning Bridges 7.1–7.6
Visual Learning Animations 7.1–7.6
Tools4Maths: Time

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 7 lessons 1–6

AC Links
MG020, MG021, MG023

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 7

Ongoing assessment ● Diagnostic Post-assessment: Topic 7

Suggested time: 4 weeks

Topic

Subtraction

**Topics 2 and 5 were about joining numbers in addition.
But you don't always get more, sometimes you get less.
Subtraction is all about when things are 'taken away'
or you are comparing less with more.**

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 8

Interview Assessment: Topic 8

Lessons

Year 1 ✪ Topic 8 ✪ Subtraction

Lesson		SAB* page	TRB* page
8.1	Using the Minus Sign	51	12
8.2	Finding Difference	52	14
8.3	Writing Subtraction Sentences	53	16
8.4	Understanding Comparison Stories	54	18
8.5	Subtracting with 0, 1 and 2	55	20
8.6	Finding Missing Parts of 8	56	22
8.7	Finding Missing Parts of 6 and 7	57	24
8.8	Finding Missing Parts of 10	58	26
8.9	Writing More Subtraction Sentences	59	28

Activity Zone 1
Digital Card 8
Games Cards 8.1–8.9 (★ and ★★)
Investigations Cards 8A, 8B, 8C

Interactive Whiteboard DVD 1
Visual Learning Bridges 8.1–8.9
Visual Learning Animations 8.1–8.9
Tools4Maths: Counters

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 8 lessons 1–9

AC Links
NA013, NA015

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 8

Ongoing assessment ● Diagnostic Post-assessment: Topic 8

Topic 9

Year 1 Contents Sequence

Suggested time: 2.5 weeks

Topic

Numbers and Place Value to 100

In this topic you will do more counting, all the way up to 100.

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 9

Interview Assessment: Topic 9

Lessons

Year 1 ✪ Topic 9 ✪ Numbers and Place Value to 100

Lesson		SAB* page	TRB* page
9.1	Making Numbers to 100	60	12
9.2	Identifying One More, One Less	61	14
9.3	Counting to 100	62	16
9.4	Comparing Numbers	63	18
9.5	Identifying Before, After and Between	64	20
9.6	Ordering Numbers on a Number Line	65	22

Activity Zone 1

Digital Card 9

Games Cards 9.1–9.6 (★ and ★★)

Investigations Cards 9A, 9B

Interactive Whiteboard DVD 1

Visual Learning Bridges 9.1–9.6

Visual Learning Animations 9.1–9.6

Tools4Maths: Place-value Blocks, Counters

Teacher Resource DVD 1

Replay, Practice, Challenge Worksheets Year 1 Topic 9 lessons 1–6

AC Links

NA012, NA013, NA014, NA018

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 9

Ongoing assessment ● Diagnostic Post-assessment: Topic 9

Suggested time: 2 weeks

Topic

Fractions: Equal Parts of Shapes

**We often need to make things into smaller parts,
or talk about parts of a whole group.
When we do this we are using fractions.**

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 10

Interview Assessment: Topic 10

Lessons

Year 1 ✪ Topic 10 ✪ Fractions: Equal Parts of Shapes

Lesson		SAB* page	TRB* page
10.1	Folding in Half	66	12
10.2	Making Equal Parts	67	14
10.3	Identifying Half of a Group	68	16
10.4	Using Different Attributes to Find Half	69	18
10.5	Making a Whole	70	20

Activity Zone 1
Digital Card 10
Games Cards 10.1–10.5 (★ and ★★)
Investigations Cards 10A, 10B, 10C

Interactive Whiteboard DVD 1
Visual Learning Bridges 10.1–10.5
Visual Learning Animations 10.1–10.5
Tools4Maths: Fractions, Counters

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 10 lessons 1–5

AC Links
NA016, MG019

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 10

Ongoing assessment ● Diagnostic Post-assessment: Topic 10

Topic 11

Year 1 Contents Sequence

Suggested time: 2.5 weeks

Topic

Data, Graphs and Chance

Is it likely that someone in your class has a loose tooth? If you know your classmates well, you might be able to guess who has a wobbly tooth. Or you could ask everyone and record what they say in a graph. The lessons in this topic will help you learn more about collecting information in different ways. You can collect information about anything!

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 11

Interview Assessment: Topic 11

Lessons

Year 1 ✪ Topic 11 ✪ Data, Graphs and Chance

Lesson		SAB* page	TRB* page
11.1	Collecting Data	71	12
11.2	Making Graphs With Objects	72	14
11.3	Understanding Data	73	16
11.4	Identifying What Will, Won't or Might Happen	74	18
11.5	Identifying More Likely	75	20
11.6	Identifying Certain or Impossible	76	22

Activity Zone 1
Digital Card 11
Games Cards 11.1–11.6 (★ and ★★)
Investigations Cards 11A, 11B, 11C

Interactive Whiteboard DVD 1
Visual Learning Bridges 11.1–11.6
Visual Learning Animations 11.1–11.6
Tools4Maths: Graphs, Probability

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 1 Topic 11 lessons 1–6

AC Links
SP024, SP262, SP263

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 11

Ongoing assessment ● Diagnostic Post-assessment: Topic 11

Suggested time: 1.5 weeks

Topic

Making and Sharing Groups

Can you see groups of things in your classroom? Does each group contain the same number of things? Sometimes in maths it is important to group things. Making groups in maths can help us to count quicker. Can you think of a time when it is important to have the same number of people in each group?

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 12

Interview Assessment: Topic 12

Lessons

Year 1 ✪ Topic 12 ✪ Making and Sharing Groups

Lesson		SAB* page	TRB* page
12.1	Identifying Groups	77	12
12.2	Using Groups of 2, 5 and 10	78	14
12.3	Understanding Division as Sharing	79	16

Activity Zone 1

Digital Card 12

Games Cards 12.1–12.3 (★ and ★★)

Investigations Cards 12A, 12B, 12C

Interactive Whiteboard DVD 1

Visual Learning Bridges 12.1–12.3

Visual Learning Animations 12.1–12.3

Tools4Maths: Counters, Place-value Blocks

Teacher Resource DVD 1

Replay, Practice, Challenge Worksheets Year 1 Topic 12 lessons 1–3

AC Links

NA012, NA031, NA032

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 12

Ongoing assessment ● Diagnostic Post-assessment: Topic 12

Topic 13

Year 1 Contents Sequence

Suggested time: 3 weeks

Topic

Patterns

Look around you. Patterns are everywhere.
Shapes, actions and numbers often repeat themselves in ways that you can guess.
Number patterns can help you count quickly.
Shape and colour patterns can help you decorate things quickly.

This description is found in the Contents pages of the year 1 Student Activity Book. Teachers can read this description to or with students at the start of a topic. Other topic engagement links can be found on page 6 of the Teacher Resource Booklet.

Diagnostic Pre-assessment: Topic 13

Interview Assessment: Topic 13

Lessons

Year 1 ✪ Topic 13 ✪ Patterns

Lesson		SAB* page	TRB* page
13.1	Describing Patterns	80	12
13.2	Using Patterns to Predict	81	14
13.3	Extending Shape Patterns	82	16
13.4	Using More Patterns to Predict	83	18
13.5	Counting Patterns of 2, 5 and 10	84	20
13.6	Understanding Odd and Even Numbers	85	22
13.7	Identifying Patterns on a Hundred Chart	86	24

Activity Zone 1
Digital Card 13
Games Cards 13.1–13.7 (★ and ★★)
Investigations Cards 13A, 13B, 13C, 13D, 13E

Interactive Whiteboard DVD 1
Visual Learning Bridges 13.1–13.7
Visual Learning Animations 13.1–13.7
Tools4Maths: Counters

Teacher Resource DVD 1
Replay, Practice, Challenge Worksheets Year 3 Topic 13 lessons 1–7

AC Links
NA012, NA013, NA017, NA018

* SAB = Student Activity Book 1; TRB = Year 1 Teacher Resource Booklet 13

Ongoing assessment ● Diagnostic Post-assessment: Topic 13

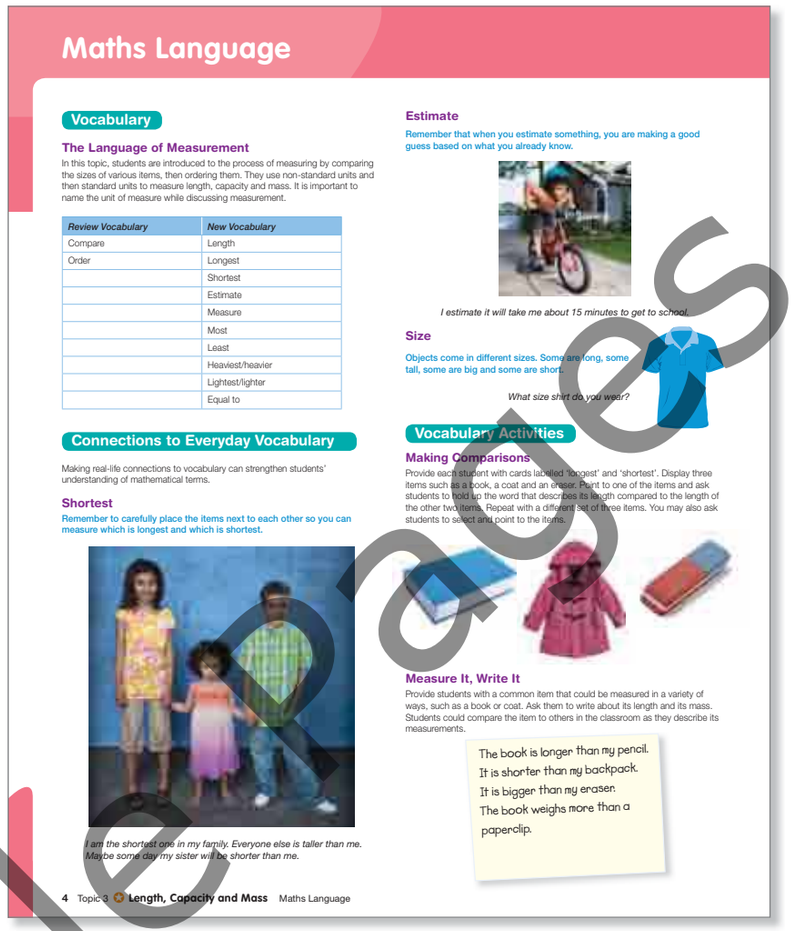
Literacy and Language

enVisionMATHS places a strong emphasis on mathematical language and terminology. The program allows for literacy to be embedded within the mathematical learning and also provides advice on introducing and explaining terminology and vocabulary to ESL students.

Level-appropriate lists of vocabulary are provided for each topic on page 4 of the Teacher Resource Booklets. The vocabulary for year 1 has been compiled alphabetically below for easy reference.

Students can record all new maths language in the My Maths Language pages in the Maths Thinking Skills Book.

'Research says mathematics is like a language and some techniques used to learn language can be used to learn the language of math' (Paris & Cunningham, 1996).



Maths Language

Vocabulary

The Language of Measurement

In this topic, students are introduced to the process of measuring by comparing the sizes of various items, then ordering them. They use non-standard units and then standard units to measure length, capacity and mass. It is important to name the unit of measure while discussing measurement.

Review Vocabulary	*New Vocabulary*
Compare	Length
Order	Longest
	Shortest
	Estimate
	Measure
	Most
	Least
	Heaviest/heavier
	Lightest/lighter
	Equal to

Connections to Everyday Vocabulary

Making real-life connections to vocabulary can strengthen students' understanding of mathematical terms.

Shortest

Remember to carefully place the items next to each other so you can measure which is longest and which is shortest.

I am the shortest one in my family. Everyone else is taller than me. Maybe some day my sister will be shorter than me.

Estimate

Remember that when you estimate something, you are making a good guess based on what you already know.

I estimate it will take me about 15 minutes to get to school.

Size

Objects come in different sizes. Some are long, some tall, some are big and some are short.

What size shirt do you wear?

Vocabulary Activities

Making Comparisons

Provide each student with cards labelled 'longest' and 'shortest'. Display three items such as a book, a coat and an eraser. Point to one of the items and ask students to hold up the word that describes its length compared to the length of the other two items. Repeat with a different set of three items. You may also ask students to select and point to the items.

Measure It, Write It

Provide students with a common item that could be measured in a variety of ways, such as a book or coat. Ask them to write about its length and its mass. Students could compare the item to others in the classroom as they describe its measurements.

The book is longer than my pencil.
It is shorter than my backpack.
It is bigger than my eraser.
The book weighs more than a paperclip.

4 Topic 3 **Length, Capacity and Mass** Maths Language

Year 1 Vocabulary

1 less	corner	forwards	lighter/lightest	part	square
1 more	cube	four	likely	pattern	subtract
2D shape	cylinder	fourteen	longest	plus (+)	subtraction sentence
3D object	date	graph	measure	predict	sum
add	day	greater	minus sign	real graph	table
addend	difference	greater than	minute	rectangle	take away
addition sentence	digit	greatest	minute hand	rectangular prism	ten
after	double/doubles	groups	missing part	repeats	tens
altogether	doubles plus 1	growing pattern	month	roll	thirteen
anti-clockwise	eight	half	more	row	three
backwards	eighteen	half an hour	more than	separate	total number
before	eleven	heavier/heaviest	most	seven	triangle
between	equal parts	hour	near double	seventeen	turn
break apart a ten	equals (=)	hour hand	nine	shape	twelve
calendar	equal share	hundred chart	nineteen	shortest	twenty
certain	equal sign	impossible	number	side	two
circle	equal to	join	o'clock	six	two-digit
clockwise	estimate	largest	odd	sixteen	under
closest ten	even	least	one	slide	unlikely
coins	fifteen	length	ones	smallest	value
column	five	less	order	sort	week
compare	flat surface	less than	pair	sphere	
cone	flip				

Materials

The following table lists the concrete materials you may need to use during the program for this year. To assist you in pre-preparation, the brackets indicate how many of each item you may need throughout the year, based on a class size of 25 students.

- ☐ analogue clock faces (25)
- ☐ assorted rhythm instruments, e.g. sticks, bells (25)
- ☐ attribute blocks (25 sets)
- ☐ bags to hold number tiles (50)
- ☐ balance scales (12)
- ☐ black paper
- ☐ building blocks (10 sets)
- ☐ card
- ☐ catalogues from shops
- ☐ chalk
- ☐ chart paper
- ☐ clock with second hand
- ☐ counters in several colours (at least 20 of each colour per student, 1000 of each colour)
- ☐ craft sticks (500)
- ☐ crayons
- ☐ dice (50)
- ☐ digital clock
- ☐ dominoes (25 sets)
- ☐ dot stickers (at least 2 colours, 200 of each colour)
- ☐ egg cartons (25)
- ☐ egg timers (15)
- ☐ empty boxes
- ☐ felt tip markers (10 sets)
- ☐ geared demonstration clock
- ☐ glue
- ☐ hundred charts (50)
- ☐ index cards
- ☐ large number cards 0–25 (5 sets)
- ☐ marble bags (25)
- ☐ marbles (500)
- ☐ masking tape
- ☐ modelling clay
- ☐ number cards 0–10 (25 sets)
- ☐ number tiles 0 to 30 (100 sets)
- ☐ paper bags (200)
- ☐ paper plates (100)
- ☐ paperclips (large and small)
- ☐ pasta shapes (e.g. spiral and tube)
- ☐ pattern blocks (25 sets)
- ☐ pencils
- ☐ place-value blocks
- ☐ plastic animals (100)
- ☐ plastic or paper cups (200)
- ☐ play money—coins (25 sets)
- ☐ playdough
- ☐ rubber bands
- ☐ rubber snakes (25)
- ☐ sand (or sugar, salt or glitter)
- ☐ scissors (25)
- ☐ small number cards 0–25 (25 sets)
- ☐ split pins
- ☐ stopwatches (25)
- ☐ straws (500)
- ☐ string
- ☐ ten frames (100)
- ☐ tin cans (25)
- ☐ toy cars (100)
- ☐ tracing paper
- ☐ Unifix cubes or similar (sets in at least 2 colours—red and blue)

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The Multi-age Classroom

enVisionMATHS is designed to allow for differentiation at all stages and provides resources that allow the planning of pathways for different ages and levels within the same classroom.

- **Skills Trace** in the Teacher Resource Book gives advice on which lessons from the preceding and following year levels relate to the topic.
- **Topics** starting with general knowledge and vocabulary make students think about the maths and the 'why' of the strategies, making real-life connections.
- Open-ended **problem solving**, catering to a variety of skill levels, is provided in every lesson.
- Topic-based **Activity Zone Cards** presenting differentiated learning activities:
  - **Investigations Cards**—progressively more advanced inquiry activities
  - **Games Cards**—provided at two different levels
  - **Digital Cards**—allow students to work at their own pace with **Tools4Maths**.
- **Differentiated Worksheets** on the Teacher Resource DVD provide three levels of activity to cover replays, practices and challenges.
- **Individual needs** activity ideas and strategies
- **ESL needs** strategies and activity ideas
- **Error intervention** tips
- **Extension** ideas

enVisionMATHS lends itself to an inquiry-based classroom through the investigations that encourage cross-curricular and interdisciplinary study. The abundance of separate resources such as Activity Zone cards, Visual Learning Animations (VLAs), Differentiated Worksheets and Tools4Maths can then be used with different age and ability groups as required. The Teacher Resource DVD, which covers three year level components, can provide the means to plan for this.

To aid in planning the program provides for year 1:

- Interview, Pre- and Post-assessments for years F, 1 and 2
- VLBs and planning documents for years F, 1 and 2
- Differentiated Worksheets for years F, 1 and 2
- Colour-coded strands throughout the program
- Easy-to-use sections of text in the Teacher Resource Booklets that are short but colourful and informative.

Sample Pathways

In a multi-age classroom, the teacher could organise the class to reflect a guided reading session, with students rotating around activities, including teacher focus groups. The teacher could show younger students the VLA and instruct while older students work on an Investigation card or other Activity Zone activity. Then, when the younger students are set to work on student books, the older students watch the VLA.

Some sample pathways are shown on the following pages.

The Multi-age Classroom

Year F/1 Classroom

Year 1 Topic 3 ✪ Length, Capacity and Mass ✪ Lesson 4: Comparing and Ordering Capacity

Skills Trace

Find a year F lesson that complements the year 1 lesson, according to the ability mix within the class.

Looking Back ✪ Foundation Lessons

Topic 4 Length, Capacity and Mass

- 4.1 Comparing and Ordering Size
- 4.2 Comparing Length
- 4.3 Ordering by Length
- 4.4 Ordering Many Objects by Length
- 4.5 Measuring Length with Informal Units
- 4.6 Measuring Length with Cubes
- 4.7 Comparing Capacity
- 4.8 Comparing Mass

Year 1 ✪ Topic 3 Lessons

- 3.1 Comparing and Ordering Length
- 3.2 Measuring Length with Informal Units
- 3.3 Estimating and Measuring Length
- 3.4 Comparing and Ordering Capacity
- 3.5 Comparing and Ordering Mass

Looking Ahead ✪ Year 2 Lessons

Topic 8 Length, Area, Capacity and Mass

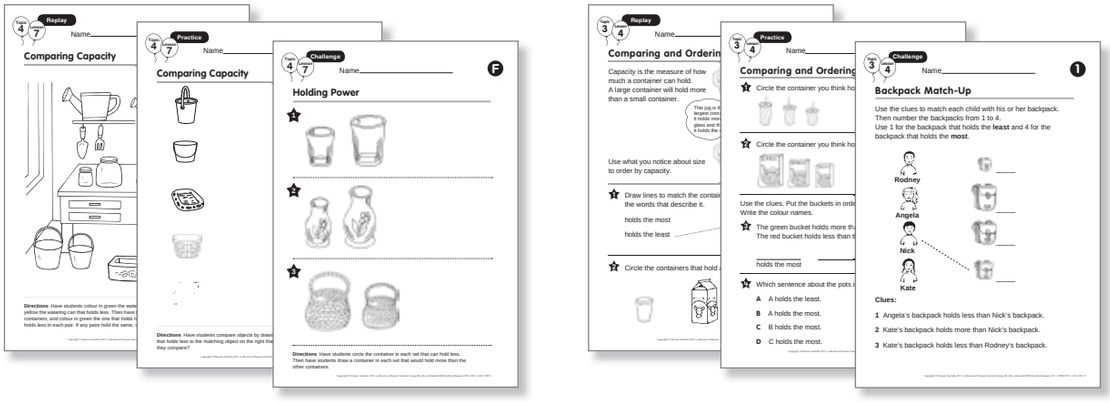
- 8.1 Exploring Length
- 8.2 Reasoning About Measurement
- 8.3 Estimating and Comparing Length Using Metres
- 8.4 Understanding Length Around
- 8.5 Understanding Area
- 8.6 Estimating and Comparing Capacity Using Litres
- 8.7 Measuring Mass
- 8.8 Estimating and Comparing Mass Using Kilograms
- 8.9 Understanding Attributes of Objects

VLB/VLA Groups

Show year F VLA 4.7 to whole class, then break into ability or age groups to use year 1 VLA 3.4 or VLBs from year F Lesson 4.7 or year 1 lesson 3.4. Students then work on SAB F lesson 4.7 or SAB 1 lesson 3.4. Year F topic 4 or year 1 topic 3 Activity Zone cards can then be used with or without supervision, as appropriate.

Differentiated Worksheets

Replay, Practice or Challenge worksheets for year F Lesson 4.7 or year 1 lesson 3.4, as appropriate. These can be used for extra class practice or homework.



Year 1/2 Classroom

Year 1 Topic 3 ✪ Length, Capacity and Mass ✪ Lesson 4: Comparing and Ordering Capacity

Skills Trace

Find a year 2 lesson that complements the year 1 lesson, according to the ability mix within the class.

Looking Back ✪ Foundation Lessons

Topic 4 Length, Capacity and Mass

- 4.1 Comparing and Ordering Size
- 4.2 Comparing Length
- 4.3 Ordering by Length
- 4.4 Ordering Many Objects by Length
- 4.5 Measuring Length with Informal Units
- 4.6 Measuring Length with Cubes
- 4.7 Comparing Capacity
- 4.8 Comparing Mass

Year 1 ✪ Topic 3 Lessons

- 3.1 Comparing and Ordering Length
- 3.2 Measuring Length with Informal Units
- 3.3 Estimating and Measuring Length
- 3.4 Comparing and Ordering Capacity
- 3.5 Comparing and Ordering Mass

Looking Ahead ✪ Year 2 Lessons

Topic 8 Length, Area, Capacity and Mass

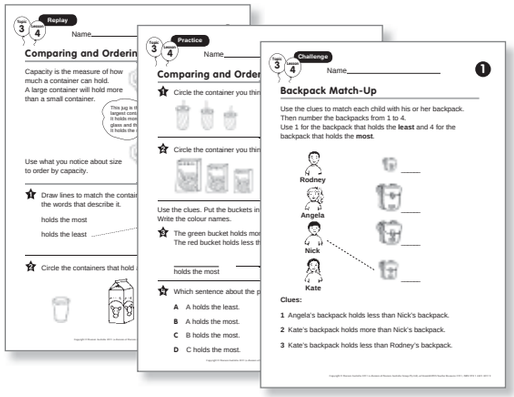
- 8.1 Exploring Length
- 8.2 Reasoning About Measurement
- 8.3 Estimating and Comparing Length Using Metres
- 8.4 Understanding Length Around
- 8.5 Understanding Area
- 8.6 Estimating and Comparing Capacity Using Litres
- 8.7 Measuring Mass
- 8.8 Estimating and Comparing Mass Using Kilograms
- 8.9 Understanding Attributes of Objects

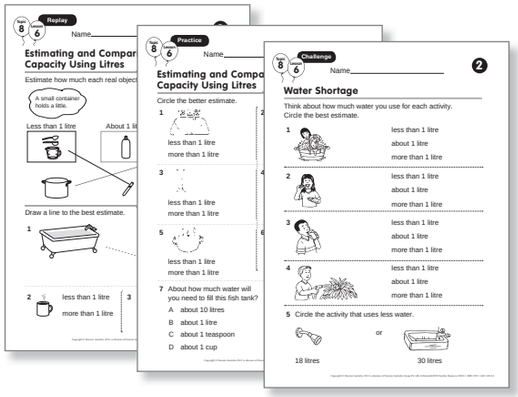
VLB/VLA Groups

Show year 1 VLA 3.4 to whole class, then break into ability or age groups to use year 2 VLA 8.6 or VLBs from year 2 Lesson 8.6 or year 1 lesson 3.4. Students then work on SAB 1 lesson 3.4 or SAB 2 lesson 8.6. Year 2 topic 8 or year 1 topic 3 Activity Zone cards can then be used with or without supervision, as appropriate.

Differentiated Worksheets

Replay, Practice or Challenge worksheets for year 1 Lesson 3.4 or year 2 lesson 8.6, as appropriate. These can be used for extra class practice or homework.





Teacher Resource Booklet

A teacher starts a topic using their set of **enVisionMATHS** Teacher Resource Booklets to assist in planning and assessment. The Maths Background section in each Teacher Resource Booklet enhances the professional development of generalist teachers and their implementation of each topic.

Each booklet contains reduced-sized copies of all components for the topic so that when working away from school, teachers need only take a lightweight booklet with them for their planning.

There is one Teacher Resource Booklet for each year 1 topic.

Skills Trace and Suggested Teaching Sequence

Looking Back: Foundation Lessons: signposts to earlier lessons that have dealt with the topics or which provide an introduction or good basis for the year 1 topic. These lessons may be useful for extra reinforcement of the topic basics.

Looking Ahead: Year 2 Lessons: signposts to later lessons that deal with year 1 topics. These lessons may be useful for more able students who require further challenges.

Topic 7 Time and Location

Skills Trace

Looking Back ✪ Foundation Lessons

Topic 7 Time
- 7.1 Reasoning to Find Times of the Day
- 7.2 Ordering Events
- 7.3 Understanding More Time, Less Time
- 7.4 Understanding Days of the Week
- 7.5 Yesterday, Today and Tomorrow
- 7.6 Identifying Numbers on a Clock
- 7.7 Telling Time on the Hour

Year 1 ✪ Topic 7 Lessons
- 7.1 Estimating and Ordering Time Lengths
- 7.2 Understanding Times of Events
- 7.3 Understanding Hour and Minute Hands
- 7.4 Telling and Writing Time to the Hour
- 7.5 Telling and Writing Time to Half an Hour
- 7.6 Giving and Following Directions

Looking Ahead ✪ Year 2 Lessons

Topic 5 Time
- 5.1 Estimating Time
- 5.2 Telling and Writing Time to the Half Hour
- 5.3 Telling and Writing Time to the Quarter Hour

Topic 6 Shapes and Location
- 6.6 Using Maps of Familiar Locations

Suggested Teaching Sequence

Topic
- Teacher planning (using pp. 2–11 of this booklet)
- Topic engagement activities (p. 6)
- Interview assessment given to students (p. 25)
- Pre-assessment given to students (p. 26)

Lessons
- Introduce each lesson by setting the purpose.
- Watch the VLA (Visual Learning Animation) and show students the Visual Learning Bridge (VLB) on the IWB or as a printed copy to support students in understanding the concept.
- Whole-class teaching focus, exploring and consolidating the concept.
- Students complete activity in the Student Activity Book.
- Small-group work with students who may need further instruction (error intervention, extension), rest of class work in groups on differentiated learning centre activities from the Activity Zone that are appropriate to their level (refer to pp. 8–11 of this booklet), recording their work in their Maths Thinking Skills Book.
- Whole-class reflection.
- Students record reflections in their Maths Thinking Skills Book.
- Differentiated worksheets used for extra practice at home or school.

Assessment
- Ongoing and throughout using pp. 24–33, including post-assessment, observations and recorded work in the Maths Thinking Skills Book.

Note
Blue text = suggested question/language for teachers to use.
Pink text = answer/solution.

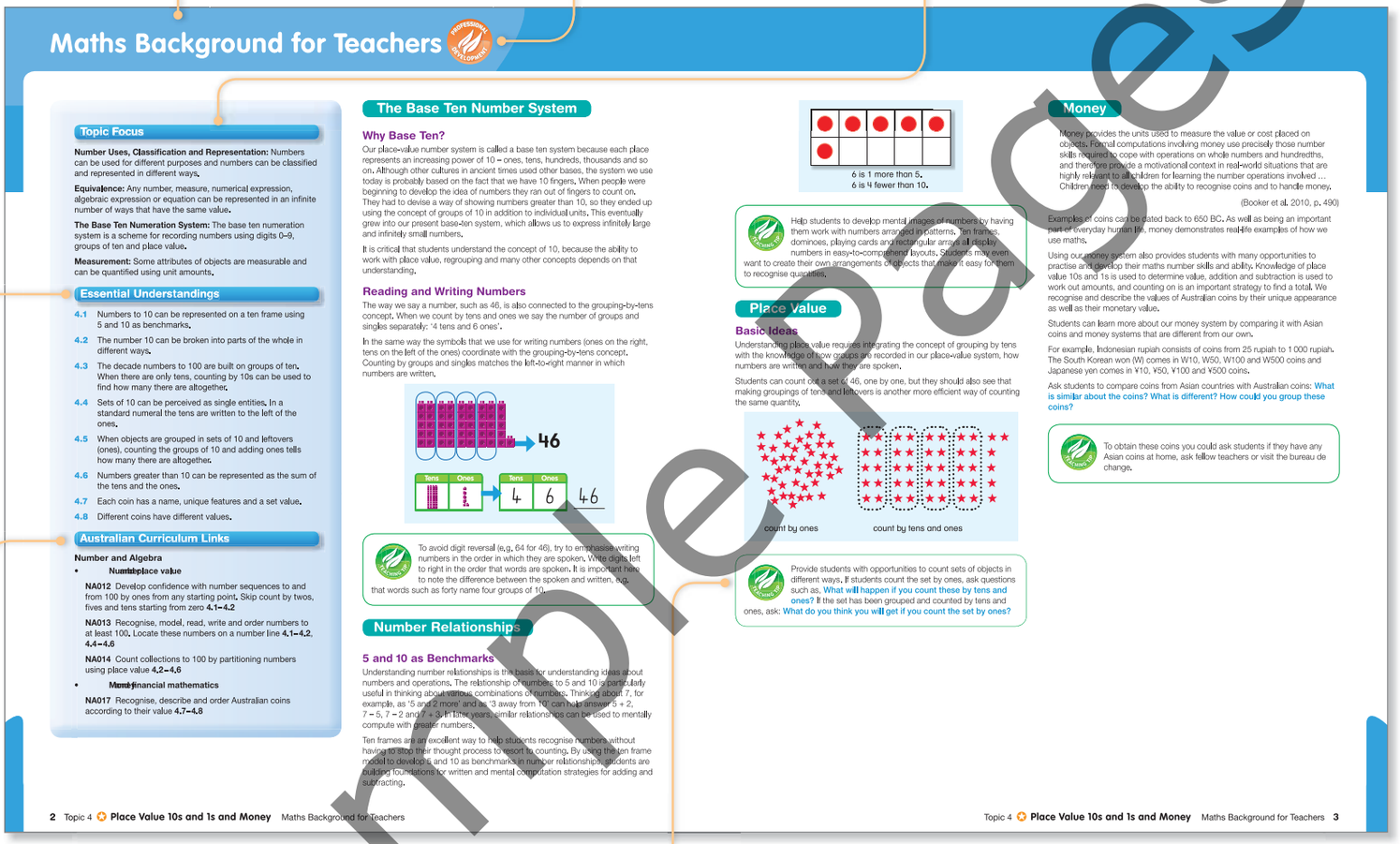
Suggested Teaching Sequence: a best-practice example for the use of **enVisionMATHS** in the classroom. Teachers are free to adapt this sequence to best suit their classes.

Maths Background for Teachers

Maths Background for Teachers: topic-focused information designed as professional development for teachers, to fill in gaps in knowledge or to provide teaching tips for the topic.

Professional development logo: indicates material designed for professional development.

Topic Focus: a reminder of the general focus for this topic.



Maths Background for Teachers

Topic Focus

Number Uses, Classification and Representation: Numbers can be used for different purposes and numbers can be classified and represented in different ways.

Equivalence: Any number, measure, numerical expression, algebraic expression or equation can be represented in an infinite number of ways that have the same value.

The Base Ten Numeration System: The base ten numeration system is a scheme for recording numbers using digits 0–9, groups of ten and place value.

Measurement: Some attributes of objects are measurable and can be quantified using unit amounts.

Essential Understandings

4.1 Numbers to 10 can be represented on a ten frame using 5 and 10 as benchmarks.

4.2 The number 10 can be broken into parts of the whole in different ways.

4.3 The decade numbers to 100 are built on groups of ten. When there are only tens, counting by 10s can be used to find how many there are altogether.

4.4 Sets of 10 can be perceived as single entities. In a standard numeral the tens are written to the left of the ones.

4.5 When objects are grouped in sets of 10 and leftovers (ones), counting the groups of 10 and adding ones tells how many there are altogether.

4.6 Numbers greater than 10 can be represented as the sum of the tens and the ones.

4.7 Each coin has a name, unique features and a set value.

4.8 Different coins have different values.

Australian Curriculum Links

Number and Algebra

- Number and place value

NA012 Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero 4.1–4.2

NA013 Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line 4.1–4.2, 4.4–4.6

NA014 Count collections to 100 by partitioning numbers using place value 4.2–4.6

- Money and financial mathematics

NA017 Recognise, describe and order Australian coins according to their value 4.7–4.8

The Base Ten Number System

Why Base Ten?

Our place-value number system is called a base ten system because each place represents an increasing power of 10 – ones, tens, hundreds, thousands and so on. Although other cultures in ancient times used other bases, the system we use today is probably based on the fact that we have 10 fingers. When people were beginning to develop the idea of numbers they ran out of fingers to count on. They had to devise a way of showing numbers greater than 10, so they ended up using the concept of groups of 10 in addition to individual units. This eventually grew into our present base-ten system, which allows us to express infinitely large and infinitely small numbers.

It is critical that students understand the concept of 10, because the ability to work with place value, regrouping and many other concepts depends on that understanding.

Reading and Writing Numbers

The way we say a number, such as 46, is also connected to the grouping-by-tens concept. When we count by tens and ones we say the number of groups and singles separately: '4 tens and 6 ones'.

In the same way the symbols that we use for writing numbers (ones on the right, tens on the left of the ones) coordinate with the grouping-by-tens concept. Counting by groups and singles matches the left-to-right manner in which numbers are written.

To avoid digit reversal (e.g. 64 for 46), try to emphasise writing numbers in the order in which they are spoken. Write digits left to right in the order that words are spoken. It is important here to note the difference between the spoken and written, e.g. that words such as forty name four groups of 10.

Number Relationships

5 and 10 as Benchmarks

Understanding number relationships is the basis for understanding ideas about numbers and operations. The relationship of numbers to 5 and 10 is particularly useful in thinking about various combinations of numbers. Thinking about 7, for example, as '5 and 2 more' and as '3 away from 10' can help to answer 5 + 2, 7 – 5, 7 – 2 and 8 + 3. If time spent similar relationships can be used to mentally compute with greater numbers.

Ten frames are an excellent way to help students recognise numbers without having to stop their thought process to resort to counting. By using the ten frame model to develop 5 and 10 as benchmarks in number relationships, students are building foundations for written and mental computation strategies for adding and subtracting.

6 is 1 more than 5.
6 is 4 fewer than 10.

Help students to develop mental images of numbers by having them work with numbers arranged in patterns, ten frames, dominoes, playing cards and irregular arrangements. Display numbers in easy-to-comprehend layouts. Students may even want to create their own arrangements of objects that make it easy for them to recognise quantities.

Place Value

Basic Ideas

Understanding place value requires integrating the concept of grouping by tens with the knowledge of how groups are recorded in our place-value system, how numbers are written and how they are spoken.

Students can count out a set of 46, one by one, but they should also see that making groupings of tens and leftovers is another more efficient way of counting the same quantity.

Provide students with opportunities to count sets of objects in different ways. If students count the set by ones, ask questions such as, What will happen if you count these by tens and ones? If the set has been grouped and counted by tens and ones, ask: What do you think you will get if you count the set by ones?

Money

Money provides the units used to measure the value or cost placed on objects. Formal computations involving money use precisely those number skills required to cope with operations on whole numbers and hundredths, and therefore provide a motivational context in real-world situations that are highly relevant to all children for learning the number operations involved … Children need to develop the ability to recognise coins and to handle money.

(Booker et al. 2010, p. 490)

Examples of coins can be dated back to 650 BC. As well as being an important part of everyday human life, money demonstrates real-life examples of how we use maths.

Using our money system also provides students with many opportunities to practise and develop their maths number skills and ability. Knowledge of place value 10s and 1s is used to determine value, addition and subtraction is used to work out amounts, and counting on is an important strategy to find a total. We recognise and describe the values of Australian coins by their unique appearance as well as their monetary value.

Students can learn more about our money system by comparing it with Asian coins and money systems that are different from our own.

For example, Indonesian rupiah consists of coins from 25 rupiah to 1 000 rupiah. The South Korean won (W) comes in W10, W50, W100 and W500 coins and Japanese yen comes in ¥10, ¥50, ¥100 and ¥500 coins.

Ask students to compare coins from Asian countries with Australian coins: What is similar about the coins? What is different? How could you group these coins?

To obtain these coins you could ask students if they have any Asian coins at home, ask fellow teachers or visit the bureau de change.

2 Topic 4 Place Value 10s and 1s and Money Maths Background for Teachers

Topic 4 Place Value 10s and 1s and Money Maths Background for Teachers 3

Australian Curriculum Links: a quick reference relating each lesson to the relevant content description of the Australian Curriculum: Mathematics.

Essential Understandings: the specific understandings related to each lesson in this topic.

Teaching tip logo: indicates specific quick teaching tips.

'Research says that teaching for understanding results in better performance that lasts longer' (Pesek & Kirshner, 2000).

Maths Language/Meeting Individual Needs

Vocabulary: a list of the specific new and review vocabulary that should be used within this topic, and suggestions for encouraging students to connect with this vocabulary.

ESL: strategies for encouraging effective vocabulary understandings for ESL students.

Additional Needs: strategies and activities to suit additional needs students.

Maths Language

Vocabulary

The Language of Addition

As students learn addition facts the strategies they will be using become more sophisticated. Knowing the correct mathematical terminology will make learning those strategies easier. Some addition strategies will require students to estimate, compare and order numbers. Understanding terms related to these strategies will help students to understand the strategies more fully.

In this topic students will use a range of terms related to addition. Understanding and practising the use of these terms will help increase their ability to write number sentences in problem-solving situations.

The following vocabulary will be encountered in this topic.

Review Vocabulary	*New Vocabulary*
More	Double
Less	Near double
Altogether	Greater
Addition sentence	Doubles
Sum	Doubles plus 1
Plus (+)	
Equals (=)	
Addend	
Join	

Connections to Everyday Vocabulary

Making real-life connections to vocabulary can strengthen students' understanding of mathematical terms.

Greater

Remember, greater is another way to say that something is more than something else.

The amount of fruit in the basket is greater than the amount of fruit in the bowl.

Less

Remember when one number comes before another number it is less than the first number.

The number of books on the table is less than the number of books on the shelf.

Doubles

Remember, doubles are two numbers that are exactly the same, such as 7 and 7.

My 2 cats are doubles. They look exactly alike.

Near doubles

Near doubles are two numbers that differ by one, such as 2 and 3 or 8 and 9.

My two dogs are near doubles. They look alike, except one is bigger than the other.

Doubles Plus 1

2 + 2 is a doubles fact.

2 + 3 is 1 more than 2 + 2

It is a doubles-plus-1 fact.

The clown had 2 juggling balls. Then he doubled that amount. Now he is adding 1 more!

Doubles Plus 2

3 + 3 is a doubles fact.

3 + 5 is 2 more than 3 + 3

It's a doubles-plus-2 fact.

There were 3 flowers. Now there will be double that amount plus 2.

Vocabulary Activities

What's the Double?

Call on a volunteer to think of a number. The other students will take turns trying to guess that number's double. Each time someone guesses a number the student needs to answer 'Too high', 'Too low' or 'Near double'. The student who guesses the number has the next turn to pick a number and the game continues.

Secret Number	*Guess*
7	3 too low
	9 too high
	6 near double
	7 That's the double!

Double Up

Write an addition fact on each of three index cards. Include a doubles fact, a doubles-plus-1 fact and a doubles-plus-2 fact. Put the cards on a table along with vocabulary cards that say *doubles*, *doubles plus 1* and *doubles plus 2*. Have students find an addition fact to go with each vocabulary card. Repeat the activity on a different day with a different set of addition facts.

Meeting Individual Needs

ESL

Considerations for ESL Students

Help English language learners connect the language of addition to the skills and concepts in this topic. Present the material using multiple representations.

- **Beginning** Emphasise the number words and the language of addition while you are teaching the skills and concepts. When you write the number sentence or model one with concrete materials, read it in English while pointing to each part of the problem. When helping students individually, begin by helping them read the problem aloud.
- **Intermediate** Help English language learners connect words such as altogether, sum, plus and add with addition. Have students act out situations such as *'I have 3 red pencils and 2 yellow pencils. How many pencils do I have altogether?'* As students act out situations write the addition sentences on the board.
- **Extending** Challenge students to go beyond the vocabulary needed to give the correct answers. Ask them Why? How do you know this? and other questions to help them develop the ability to explain the reasons behind correct answers.

ESL Activity: Show and Tell

Use with lesson 5.6

10 minutes

Materials

None

- Write a problem similar to those in lesson 5.6 on the board. Call two volunteers to the board. Have one work out the problem while the other explains the process. Repeat with other volunteers.
- When necessary, ask clarifying questions to help the student explain the problem more thoroughly. Model the required vocabulary when a student is struggling.

Additional Needs

Considerations for Additional Needs Students

Additional needs students may require extra practice with concrete and visual materials. It is important to give them enough repetition to fully develop each concept before progressing to the next.

When beginning a new concept, briefly reinforce previously learnt material that you will refer to in that lesson. For example, ask questions such as Who remembers what a double is? or What does it mean to find the sum? before asking students to apply doubles or sums in new contexts.

Additional Needs Activity: Seeing Double

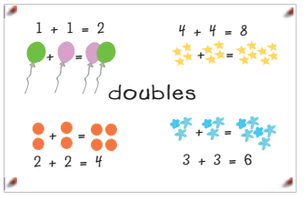
Use with lesson 5.3

10 minutes

Materials

Paper and crayons

- Write the word *doubles* on the board and have the students copy it. Model how to illustrate 'double 1' with the corresponding number sentence underneath.
- Have students represent doubles for 2 through to 6 with both a picture and a number sentence.



Activity icons (clock and student numbers): suggestions for how activities could be structured and how much time might be needed for each one.

'Research says there are a number of effective strategies for teaching math to English learners. These include strategies to enhance reading, writing, speaking and listening' (Cuevas et al. 1986).

'Research says that students learn best when instruction is designed to accommodate diverse types of learner' (Fillmore and Meyer, 1996).

Topic Engagement Links/Problem Solving

Topic Engagement Links: ideas and resources for engaging students with the topic and connecting the concepts to real-life contexts.

Problem-Solving icon: identifies problem-solving activities throughout the **enVisionMATHS** year 1 program.

Problem Solving: guidance for use alongside the problem-solving activities in the Student Activity Book. These can be set as individual student tasks or done as whole-class activities. These activities are based on the following problem solving process:

- Read and Understand: What am I trying to find? How do I know?
- Plan and Solve: What strategy or strategies should I try? Can I show the problem? How will I solve the problem? What is the answer?
- Look Back and Check: Did I check my work? Is my answer reasonable?

Topic Engagement Links

The following are suggested as ideas and resources for engaging students with the topic and connecting the concepts to real-life contexts.

Prior Knowledge

Ask students to fill in a form with answers to these questions.

What is a half?
What is an equal part?

Encourage students to use words, pictures and symbols to show what they know.

Displays

Display large, colourful shapes with a line through them to show equal parts. Display bottles (with lids) that are half-full of rice, sand or coloured water.

Books and Stories

Pat Hutchins, *The Doorbell Rang*, Morrow, 1986
When a fresh batch of biscuits are baked they need to be shared among all the visitors. What would happen to the left-over biscuits? This well-known picture storybook can be used to introduce the concepts of equal parts – a precursor to more complicated fractional ideas. Innovate on the book by asking students how they could share 1 biscuit between 2 friends; 3 biscuits between 2 friends; etc.

Activities

Half-full!

Organise for students to have access to a sand pit or sand tray. Provide the students with a range of containers. Give them time to explore the sand by filling and refilling their containers. Ask students to show a container that is half-full with sand. **How do you know it is half-full?** [Sample answer: sand takes up about half of the container.] Back in the classroom, students could draw their half-full container. They could then sit with a partner and take turns to explain why their container is half-full.

Making Half

Ask students to work with a partner and use playdough to make a variety of fruit, e.g. a banana, some grapes, an apple, some strawberries, etc. Ask students to then share their collection of fruit equally between the two of them, e.g. a banana and 10 grapes shared between two students will give each student half a banana and 5 grapes.

Games

Showing Half

Play some music and ask the students to move around the room to it. When you stop the music ask the students to form groups of even numbers, e.g. **Make a group of 4. Make a group of 8.** Then ask each group to show half of their group. For example, **Can half of your group sit down? Can half of your group put their hands on their heads? Can half of your group stand on one leg?**

Problem Solving

An understanding of fractions begins with students being able to identify the whole. It can be a single item such as a cake or a collection such as a class of students, with the whole being the number of students in the class, e.g. 25. Students experience fractions by dividing the whole into equal parts, e.g. two equal parts or four equal parts, then recognising that one of those two equal parts is a half and one of those four equal parts is a quarter. Expose students to multiple concrete and visual models.

The following information is for use alongside the problem-solving activities in the Student Activity Book.

1:10-1 Folding in Half

What shapes have students drawn? Do students have two equal parts? Ask: **How can you prove each part is equal?**

1:10-2 Making Equal Parts

Possible ways to show the two parts could include using a paper circle and making a fold, drawing a picture, using pieces from fraction modelling kits, providing a written explanation. Have students shown two equal parts? Share all the ways they thought of. Ask students to make up some What if? questions and answer them: **What if there were three friends? What if four friends wanted to share a pizza?**

1:10-3 Identifying Half of a Group

Drawings should show the same number of boys and girls. Share class drawings so that students can see the range of possibilities: one of each, two of each, three of each.

1:10-4 Using Different Attributes to Find Half

Multiple ways are possible. This is an open question. A half can be shown in many ways with the obvious one being six cubes (half of 12). If colour is used as the identifying attributes half the cubes are green. Also each of the different sets of coloured cubes can be divided into two equal groups to show a half, as there are even numbers of green, red and yellow cubes (so half of each set can be shown).

1:10-5 Making a Whole

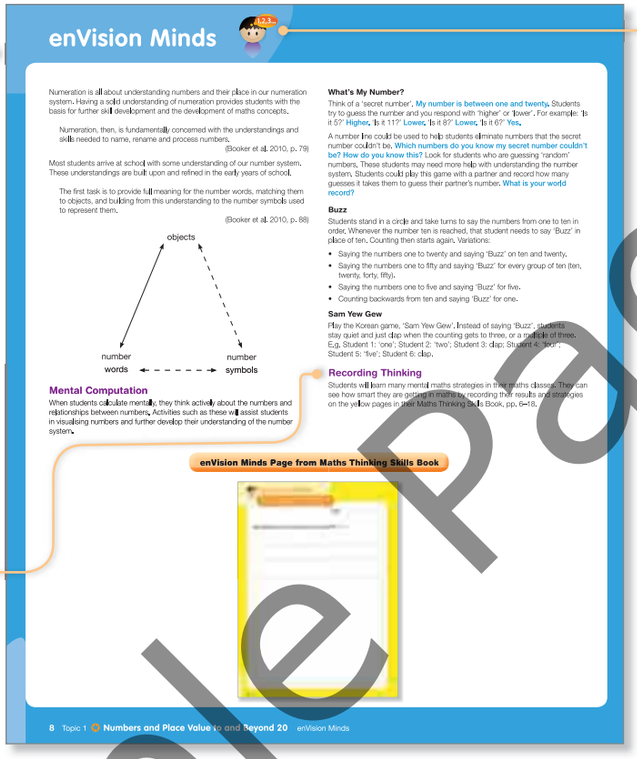
The solution is any multiple of 4, so there are infinite possibilities. Ask students: **What is the whole in this problem?** [The total number of pencils in the pencil case.] How did students solve this problem? Share the strategies – model using real pencils or coloured manipulatives, draw a picture, write an equation and look for a pattern. **How did you record your solution?** Using the beginning letters of each colour is a good shortcut for students to get into the habit of using. **Who noticed a pattern?** [one of each colour = 4, two of each colour = 8, three of each colour = 12 (counting by fours).]

Prior Knowledge task: allows teachers to gain an understanding of a student's prior knowledge in order to plan for differentiation in the classroom.

Problem-Solving responses: suggested responses and advice for each problem-solving activity in the topic.

enVision Minds and Reflections

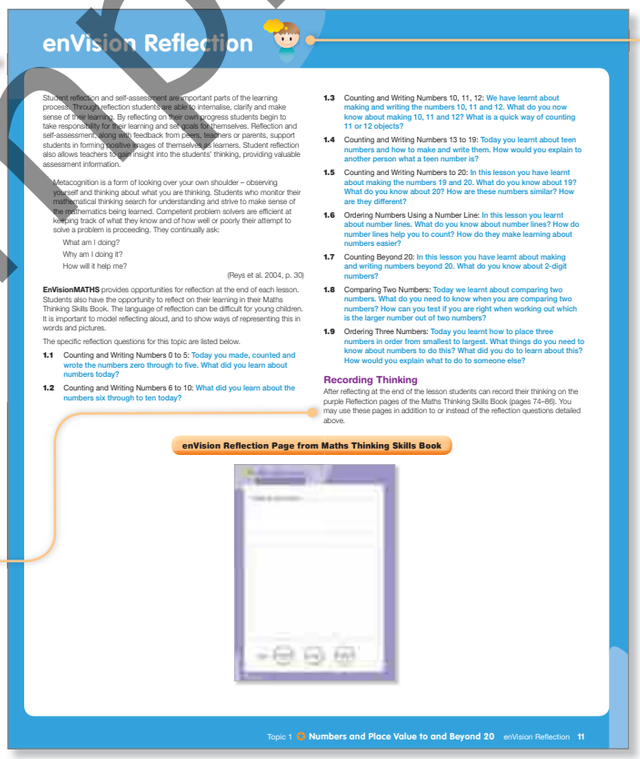
enVision Minds: guidance and strategies for initiating and guiding mental computation skills.



enVision Minds Icon: identifies mental computation activities throughout the year 1 **enVisionMATHS** program.

Recording Thinking: guidance for how students can record their mental computation thinking in the Maths Thinking Skills Book.

enVision Reflection: guidance and strategies for initiating and guiding student metacognitive reflection skills.

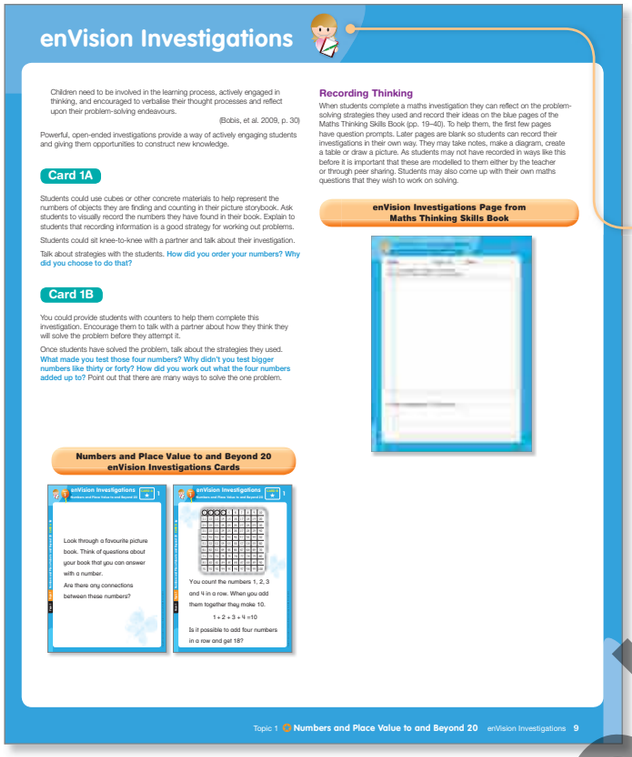


enVision Reflection Icon: identifies reflection tasks and suggestions throughout the year 1 **enVisionMATHS** program.

Recording Thinking: guidance for how students can record their reflection thinking in the Maths Thinking Skills Book.

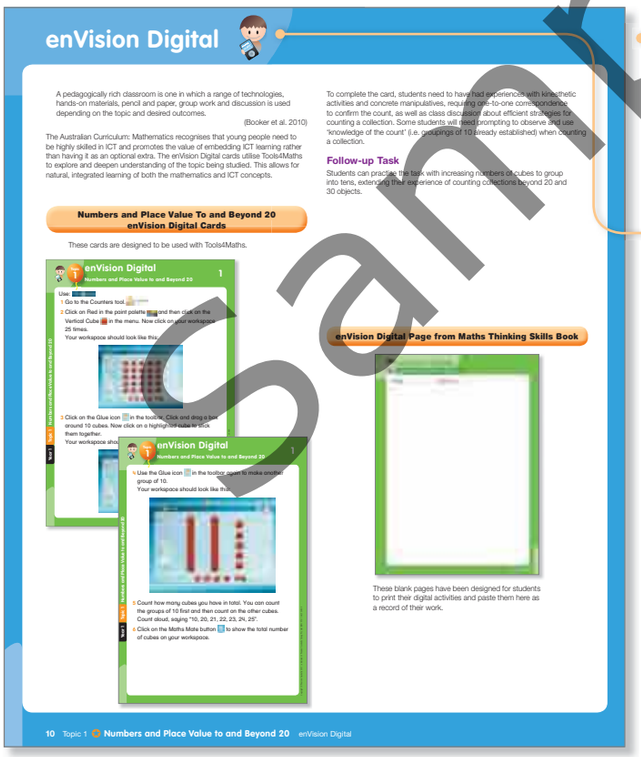
Activity Zone

Each Activity Zone card is reproduced in the Teacher Resource Booklet for ease of planning, together with the relevant Maths Thinking Skills Book pages. The Games cards appear within each lesson page in the Teacher Resource Booklets.



enVision Investigations Cards

enVision Investigations Icon: identifies use of Investigations cards throughout year 1 **enVisionMATHS** program.



enVision Digital Cards: designed to be used with Tools4Maths.

enVision Digital Icon: identifies the use of the Digital cards throughout year 1 **enVisionMATHS** program.

Lesson Page

Topic and lesson identifier

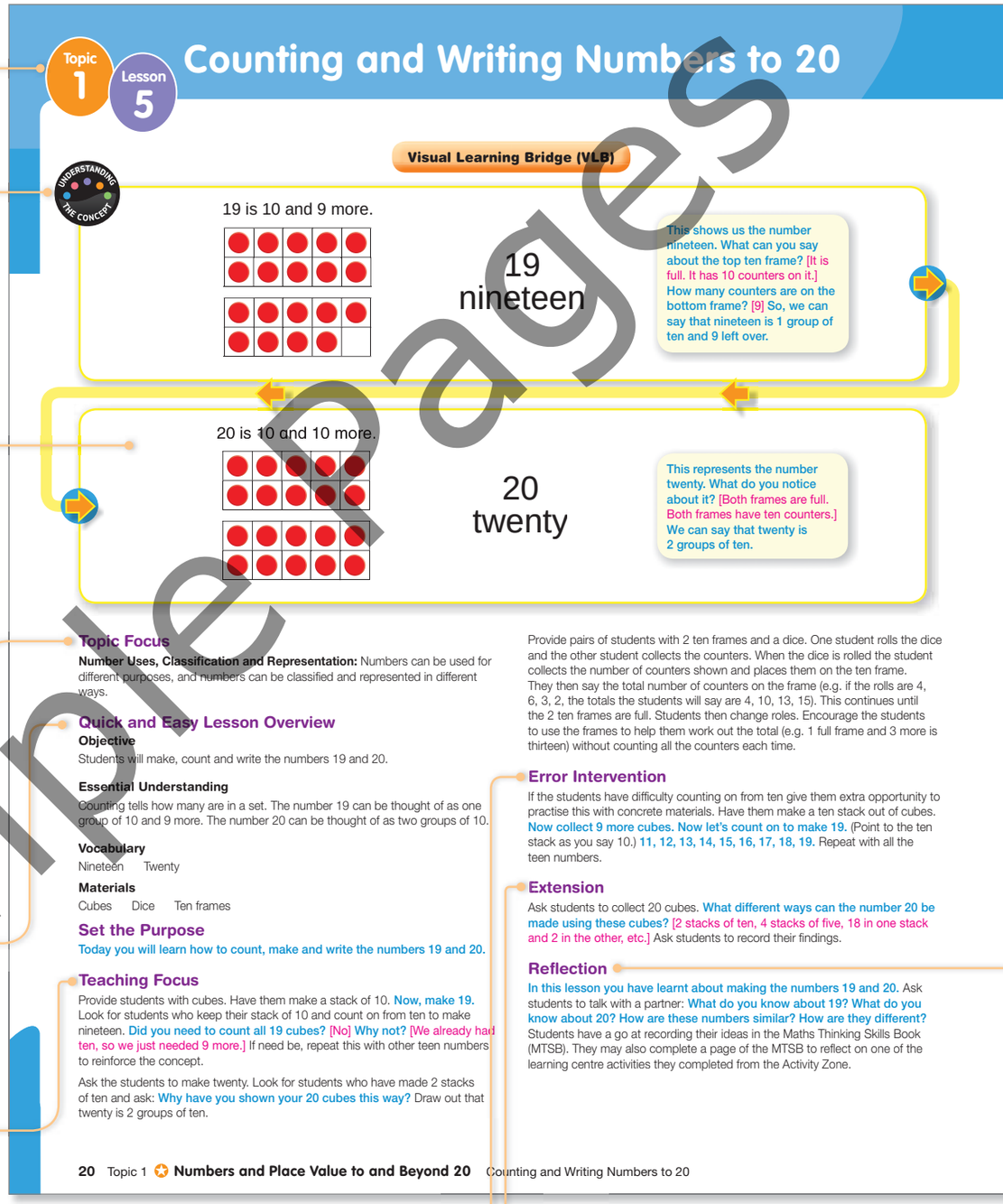
Understanding the Concept Icon: indicates text where the main lesson concept is outlined and explained.

Visual Learning Bridge: the VLB for each lesson is reproduced in full in the Teacher Resource Booklet, along with guiding questions in blue type and expected sample answers in pink. The VLB is a pictorial, step-by-step bridge between the interactive learning activity and the lesson exercises. It helps students focus on one idea at a time, as well as see connections within a sequence of ideas. Visual Learning Animations (VLAs) can be used to present the VLB digitally with animation. These VLAs are on the Interactive Whiteboard DVD.

Topic Focus: clarifies and explains the overall mathematical focus for the lesson.

Quick and Easy Lesson Overview: at-a-glance overview of the lesson, including the objective, the essential understanding, the new vocabulary and any materials required.

Teaching Focus: guidance for teachers on how to introduce and facilitate the lesson in the classroom.



Topic 1 Lesson 5

Counting and Writing Numbers to 20

Visual Learning Bridge (VLB)

19 is 10 and 9 more.

19
nineteen

This shows us the number nineteen. What can you say about the top ten frame? [It is full. It has 10 counters on it.] How many counters are on the bottom frame? [9] So, we can say that nineteen is 1 group of ten and 9 left over.

20 is 10 and 10 more.

20
twenty

This represents the number twenty. What do you notice about it? [Both frames are full. Both frames have ten counters.] We can say that twenty is 2 groups of ten.

Topic Focus

Number Uses, Classification and Representation: Numbers can be used for different purposes, and numbers can be classified and represented in different ways.

Quick and Easy Lesson Overview

Objective

Students will make, count and write the numbers 19 and 20.

Essential Understanding

Counting tells how many are in a set. The number 19 can be thought of as one group of 10 and 9 more. The number 20 can be thought of as two groups of 10.

Vocabulary

Nineteen Twenty

Materials

Cubes Dice Ten frames

Set the Purpose

Today you will learn how to count, make and write the numbers 19 and 20.

Teaching Focus

Provide students with cubes. Have them make a stack of 10. Now, make 19. Look for students who keep their stack of 10 and count on from ten to make nineteen. Did you need to count all 19 cubes? [No] Why not? [We already had ten, so we just needed 9 more.] If need be, repeat this with other teen numbers to reinforce the concept.

Ask the students to make twenty. Look for students who have made 2 stacks of ten and ask: Why have you shown your 20 cubes this way? Draw out that twenty is 2 groups of ten.

Provide pairs of students with 2 ten frames and a dice. One student rolls the dice and the other student collects the counters. When the dice is rolled the student collects the number of counters shown and places them on the ten frame. They then say the total number of counters on the frame (e.g. if the rolls are 4, 6, 3, 2, the totals the students will say are 4, 10, 13, 15). This continues until the 2 ten frames are full. Students then change roles. Encourage the students to use the frames to help them work out the total (e.g. 1 full frame and 3 more is thirteen) without counting all the counters each time.

Error Intervention

If the students have difficulty counting on from ten give them extra opportunity to practise this with concrete materials. Have them make a ten stack out of cubes. Now collect 9 more cubes. Now let's count on to make 19. (Point to the ten stack as you say 10.) 11, 12, 13, 14, 15, 16, 17, 18, 19. Repeat with all the teen numbers.

Extension

Ask students to collect 20 cubes. What different ways can the number 20 be made using these cubes? [2 stacks of ten, 4 stacks of five, 18 in one stack and 2 in the other, etc.] Ask students to record their findings.

Reflection

In this lesson you have learnt about making the numbers 19 and 20. Ask students to talk with a partner: What do you know about 19? What do you know about 20? How are these numbers similar? How are they different? Students have a go at recording their ideas in the Maths Thinking Skills Book (MTSB). They may also complete a page of the MTSB to reflect on one of the learning centre activities they completed from the Activity Zone.

20 Topic 1 ✪ Numbers and Place Value to and Beyond 20 Counting and Writing Numbers to 20

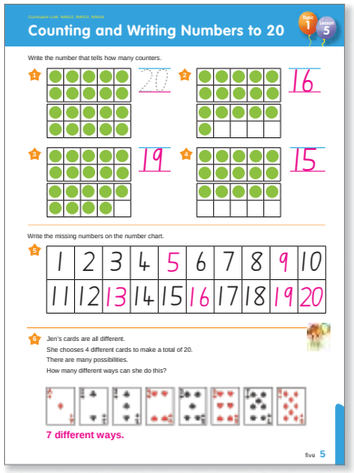
Error Intervention: simple and immediate intervention strategies if students are having consistent difficulties.

Extension: concept-based extension ideas either to reinforce concepts or provide additional challenges

Student Activity Book Page: the relevant SAB lesson page is reproduced in full here to allow teachers to plan lessons easily, without needing to access separate copies of all the program components. The answers to all the activities are included in pink.

Topic 1 Lesson 5

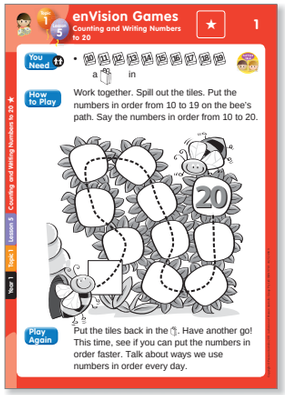
Student Activity Book Page

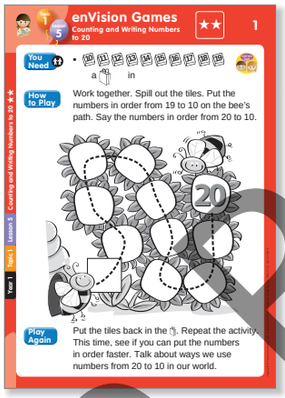


Solution to problem-solving question is on p. 7.

enVision Games

These games can be used to practise recognising and ordering numbers 10 to 20.



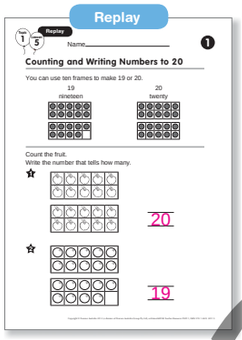


Materials needed: Number tiles 10 to 19 in a bag

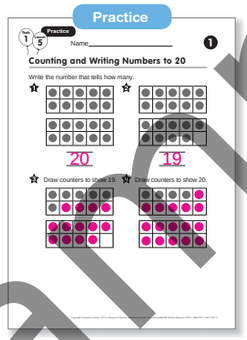
enVision Games: the relevant games cards from the Activity Zone are reproduced in full here, together with suggested guidance for their use.

Differentiated Worksheets

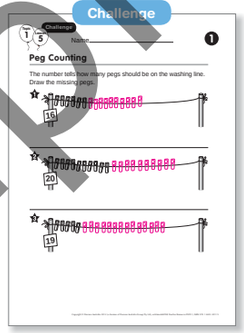
Replay



Practice



Challenge



Differentiated Worksheets: the three worksheets for this lesson are reproduced in full here, with answers in pink, to allow for easy class planning. These Replay, Practice and Challenge worksheets allow for differentiated activities related to the lesson.

Reflection: guided reflection questions for each lesson.

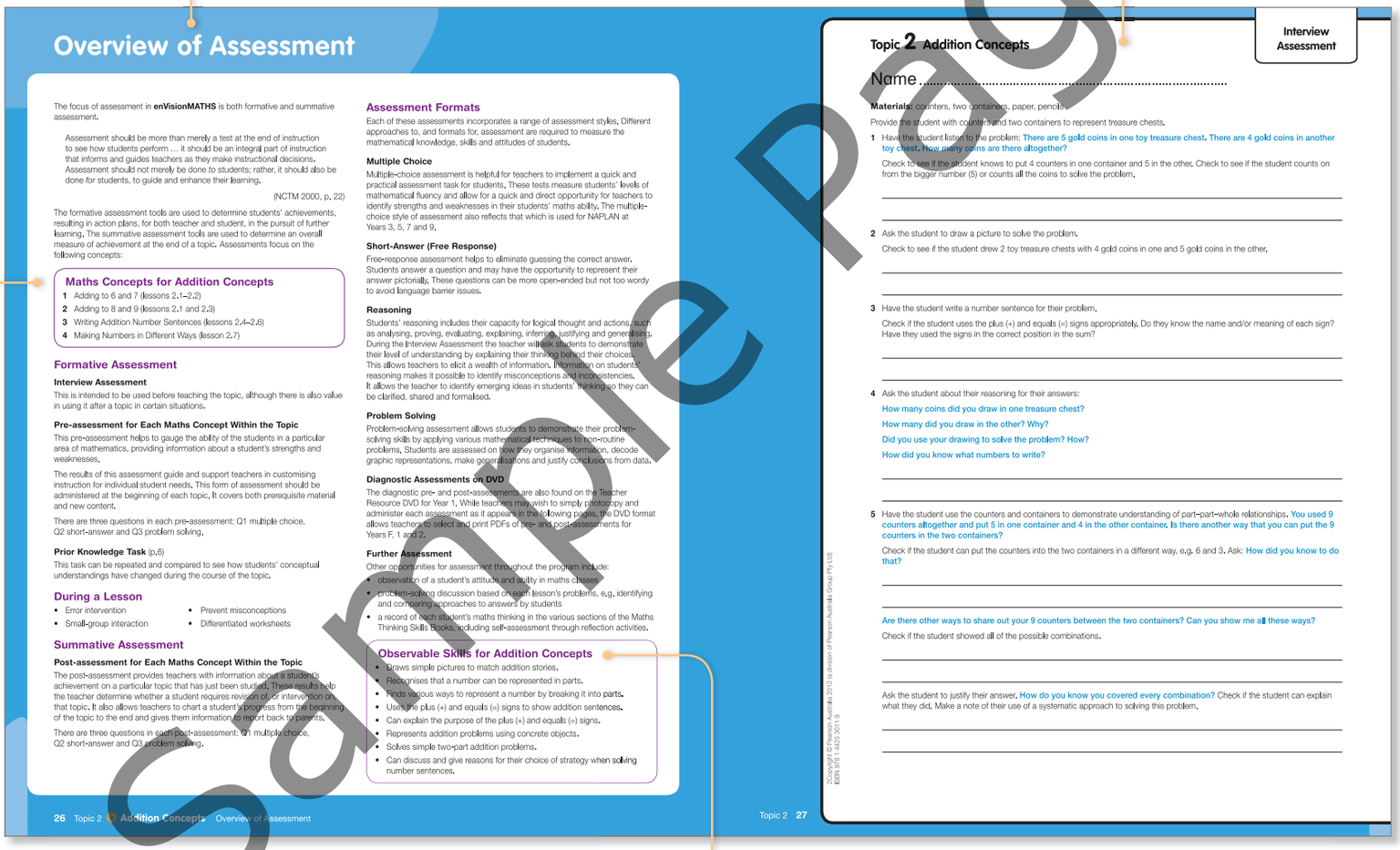
'Research says it's best to teach new content by connecting it to prior knowledge with a sustained focus over time' (Empson, 2003).

Assessment

Overview of Assessment: an outline of the different assessments possible within **enVisionMATHS**.

Interview Assessment: This one-on-one assessment can be used as a Pre- or Post-assessment as required.

These assessments have been designed and placed on the page to facilitate copying. They are also available on the Teacher Resource DVD.



Overview of Assessment

The focus of assessment in **enVisionMATHS** is both formative and summative assessment.

> Assessment should be more than merely a test at the end of instruction to see how students perform … it should be an integral part of instruction that informs and guides teachers as they make instructional decisions. Assessment should not merely be done to students; rather, it should also be done for students, to guide and enhance their learning.
>
> (NCTM 2000, p. 22)

The formative assessment tools are used to determine students' achievements, resulting in action plans, for both teacher and student, in the pursuit of further learning. The summative assessment tools are used to determine an overall measure of achievement at the end of a topic. Assessments focus on the following concepts:

Maths Concepts for Addition Concepts
1 Adding to 6 and 7 (lessons 2.1–2.2)
2 Adding to 8 and 9 (lessons 2.1 and 2.3)
3 Writing Addition Number Sentences (lessons 2.4–2.6)
4 Making Numbers in Different Ways (lesson 2.7)

Formative Assessment

Interview Assessment
This is intended to be used before teaching the topic, although there is also value in using it after a topic in certain situations.

Pre-assessment for Each Maths Concept Within the Topic
This pre-assessment helps to gauge the ability of the students in a particular area of mathematics, providing information about a student's strengths and weaknesses.

The results of this assessment guide and support teachers in customising instruction for individual student needs. This form of assessment should be administered at the beginning of each topic. It covers both prerequisite material and new content.

There are three questions in each pre-assessment: Q1 multiple choice, Q2 short-answer and Q3 problem solving.

Prior Knowledge Task (p.6)
This task can be repeated and compared to see how students' conceptual understandings have changed during the course of the topic.

During a Lesson

- Error intervention
- Small-group interaction
- Prevent misconceptions
- Differentiated worksheets

Summative Assessment

Post-assessment for Each Maths Concept Within the Topic
The post-assessment provides teachers with information about a student's achievement on a particular topic that has just been studied. These results help the teacher determine whether a student requires revision of, or intervention on, that topic. It also allows teachers to chart a student's progress from the beginning of the topic to the end and gives them information to report back to parents.

There are three questions in each post-assessment: Q1 multiple choice, Q2 short-answer and Q3 problem solving.

Assessment Formats

Each of these assessments incorporates a range of assessment styles. Different approaches to, and formats for, assessment are required to measure the mathematical knowledge, skills and attitudes of students.

Multiple Choice
Multiple-choice assessment is helpful for teachers to implement a quick and practical assessment task for students. These tests measure students' levels of mathematical fluency and allow for a quick and direct opportunity for teachers to identify strengths and weaknesses in their students' maths ability. The multiple-choice style of assessment also reflects that which is used for NAPLAN at Years 3, 5, 7 and 9.

Short-Answer (Free Response)
Free-response assessment helps to eliminate guessing the correct answer. Students answer a question and may have the opportunity to represent their answer pictorially. These questions can be more open-ended but not too wordy to avoid language barrier issues.

Reasoning
Students' reasoning includes their capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising. During the Interview Assessment the teacher will ask students to demonstrate their level of understanding by explaining their thinking behind their choices. This allows teachers to elicit a wealth of information. Information on students' reasoning makes it possible to identify misconceptions and inconsistencies. It allows the teacher to identify emerging ideas in students' thinking so they can be clarified, shared and formalised.

Problem Solving
Problem-solving assessment allows students to demonstrate their problem-solving skills by applying various mathematical techniques to non-routine problems. Students are assessed on how they organise information, decode graphic representations, make generalisations and justify conclusions from data.

Diagnostic Assessments on DVD
The diagnostic pre- and post-assessments are also found on the Teacher Resource DVD for Year 1. While teachers may wish to simply photocopy and administer each assessment as it appears in the following pages, the DVD format allows teachers to select and print PDFs of pre- and post-assessments for Years F, 1 and 2.

Further Assessment
Other opportunities for assessment throughout the program include:
- observation of a student's attitude and ability in maths classes
- problem-solving discussion based on each lesson's problems, e.g. identifying and comparing approaches to answers by students
- a record of each student's maths thinking in the various sections of the Maths Thinking Skills Books, including self-assessment through reflection activities.

Observable Skills for Addition Concepts
- Draws simple pictures to match addition stories.
- Recognises that a number can be represented in parts.
- Finds various ways to represent a number by breaking it into parts.
- Uses the plus (+) and equals (=) signs to show addition sentences.
- Can explain the purpose of the plus (+) and equals (=) signs.
- Represents addition problems using concrete objects.
- Solves simple two-part addition problems.
- Can discuss and give reasons for their choice of strategy when solving number sentences.

Interview Assessment

Topic 2 Addition Concepts

Name .....

Materials: counters, two containers, paper, pencils

Provide the student with counters and two containers to represent treasure chests.

1 Have the student listen to the problem: There are 5 gold coins in one toy treasure chest. There are 4 gold coins in another toy chest. How many coins are there altogether?
Check to see if the student knows to put 4 counters in one container and 5 in the other. Check to see if the student counts on from the bigger number (5) or counts all the coins to solve the problem.

2 Ask the student to draw a picture to solve the problem.
Check to see if the student drew 2 toy treasure chests with 4 gold coins in one and 5 gold coins in the other.

3 Have the student write a number sentence for their problem.
Check if the student uses the plus (+) and equals (=) signs appropriately. Do they know the name and/or meaning of each sign? Have they used the signs in the correct position in the sum?

4 Ask the student about their reasoning for their answers:
How many coins did you draw in one treasure chest?
How many did you draw in the other? Why?
Did you use your drawing to solve the problem? How?
How did you know what numbers to write?

5 Have the student use the counters and containers to demonstrate understanding of part–part–whole relationships. You used 9 counters altogether and put 5 in one container and 4 in the other container. Is there another way that you can put the 9 counters in the two containers?
Check if the student can put the counters into the two containers in a different way, e.g. 6 and 3. Ask: How did you know to do that?

Are there other ways to share out your 9 counters between the two containers? Can you show me all these ways?
Check if the student showed all of the possible combinations.

Ask the student to justify their answer. How do you know you covered every combination? Check if the student can explain what they did. Make a note of their use of a systematic approach to solving this problem.

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Mathematics Concepts: The concepts related to the topic, which form the basis of the **enVisionMATHS** diagnostic assessments. There are between 3 and 5 concepts per topic.

Observable skills: specific to each lesson.

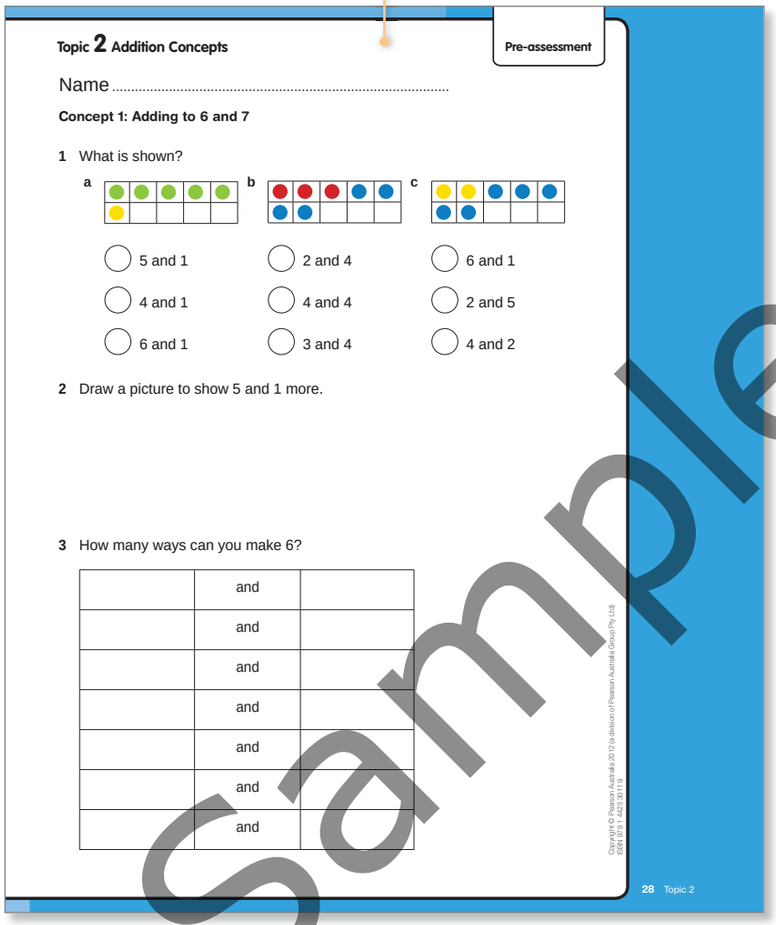
'Research says that ongoing assessment prevents misconceptions and provides valuable information to guide data-driven instruction' (Vye et al., 1998).

Diagnostic Pre-assessment: A copyable test to be provided to students at the start of a topic. These are concept-based, with one Pre-assessment per concept.

These assessments have been designed and placed on the page to facilitate copying. They are also available on the Teacher Resource DVD.

Diagnostic Post-assessment: A copyable, concept-based test to assess understanding and proficiency at the end of a topic. These are concept-based, with one Post-assessment per concept.

These assessments have been designed and placed on the page to facilitate copying. They are also available on the Teacher Resource DVD.



Topic 2 Addition Concepts

Pre-assessment

Name .....

Concept 1: Adding to 6 and 7

1 What is shown?

a

b

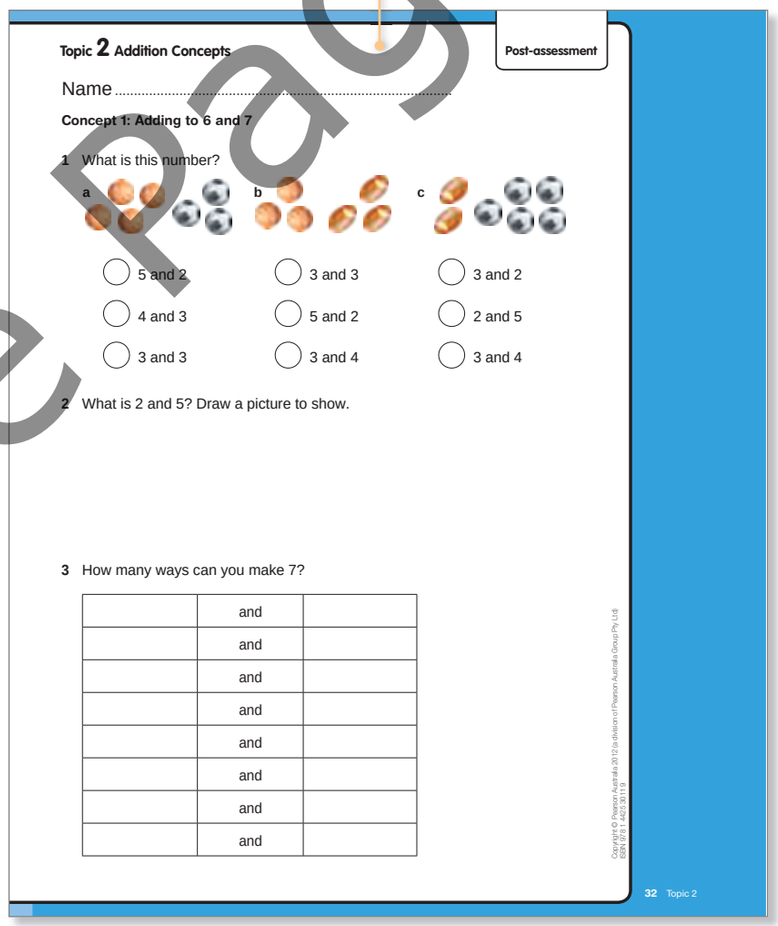
c

◯ 5 and 1	◯ 2 and 4	◯ 6 and 1
◯ 4 and 1	◯ 4 and 4	◯ 2 and 5
◯ 6 and 1	◯ 3 and 4	◯ 4 and 2

2 Draw a picture to show 5 and 1 more.

3 How many ways can you make 6?

	and	
	and	
	and	
	and	
	and	
	and	
	and	



Topic 2 Addition Concepts

Post-assessment

Name .....

Concept 1: Adding to 6 and 7

1 What is this number?

a

b

c

◯ 5 and 2	◯ 3 and 3	◯ 3 and 2
◯ 4 and 3	◯ 5 and 2	◯ 2 and 5
◯ 3 and 3	◯ 3 and 4	◯ 3 and 4

2 What is 2 and 5? Draw a picture to show.

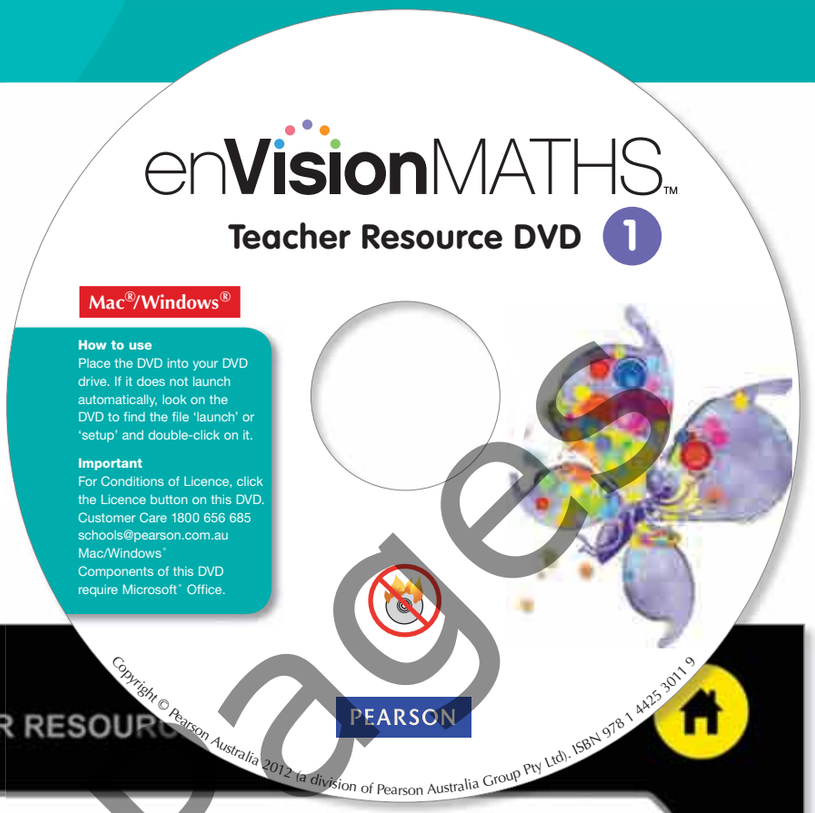
3 How many ways can you make 7?

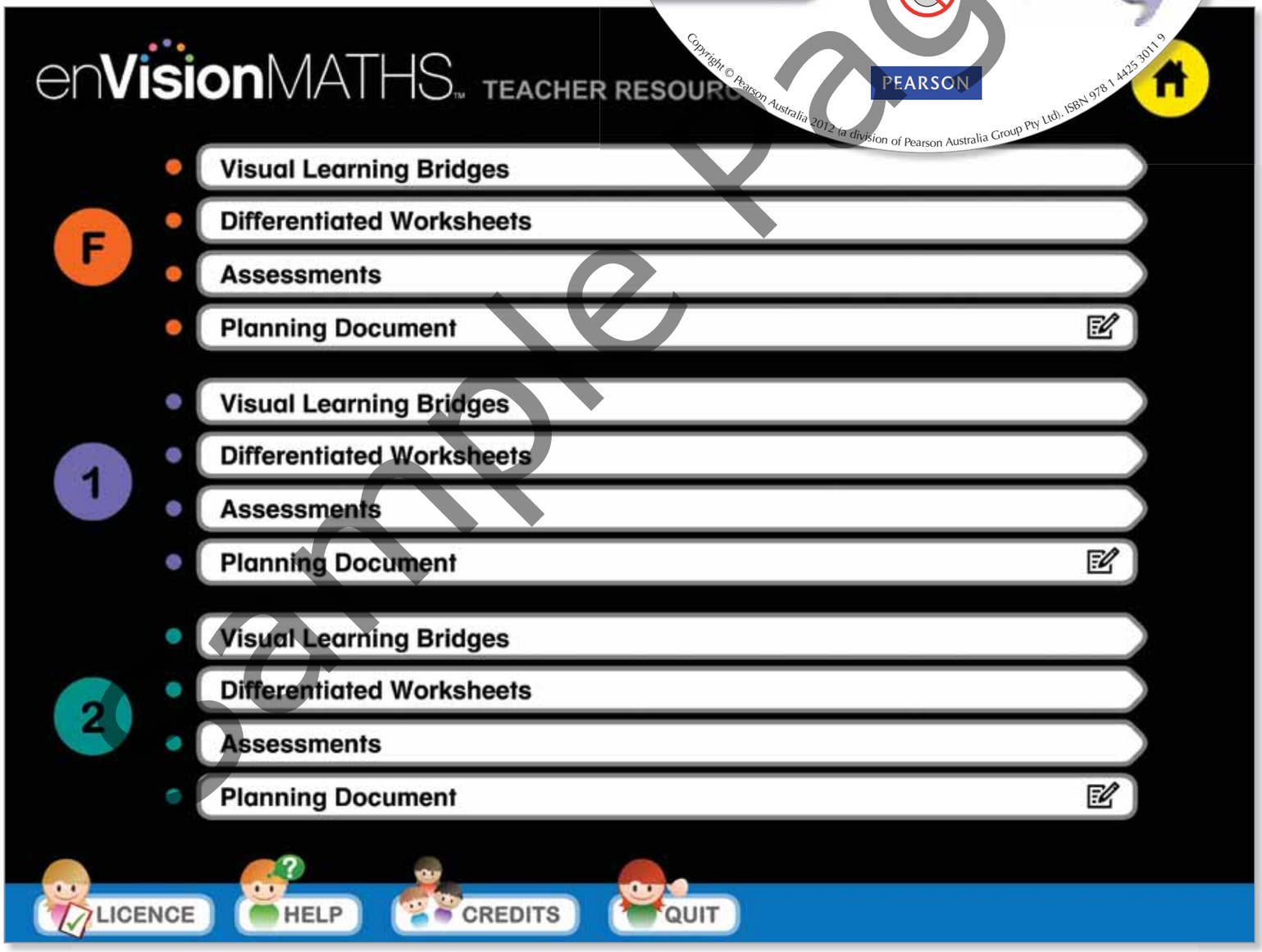
	and	
	and	
	and	
	and	
	and	
	and	
	and	

Teacher Resource DVD

The Teacher Resource DVD is found at the back of each Overview and Implementation Guide. For year 1, the DVD includes planning and recording documents, VLBs, diagnostic assessments and Differentiated Worksheets for years F, 1 and 2. This allows for differentiation in a multi-age or multi-ability classroom.

Teachers search by year level for the component they need. The VLBs, Interview Assessment, Diagnostic Pre- and Post-assessments and Differentiated Worksheets are in PDF format, allowing teachers to print sufficient quantities for their class. The planning and recording documents are Microsoft® Excel® documents that can be edited and tailored to a teacher's requirements.





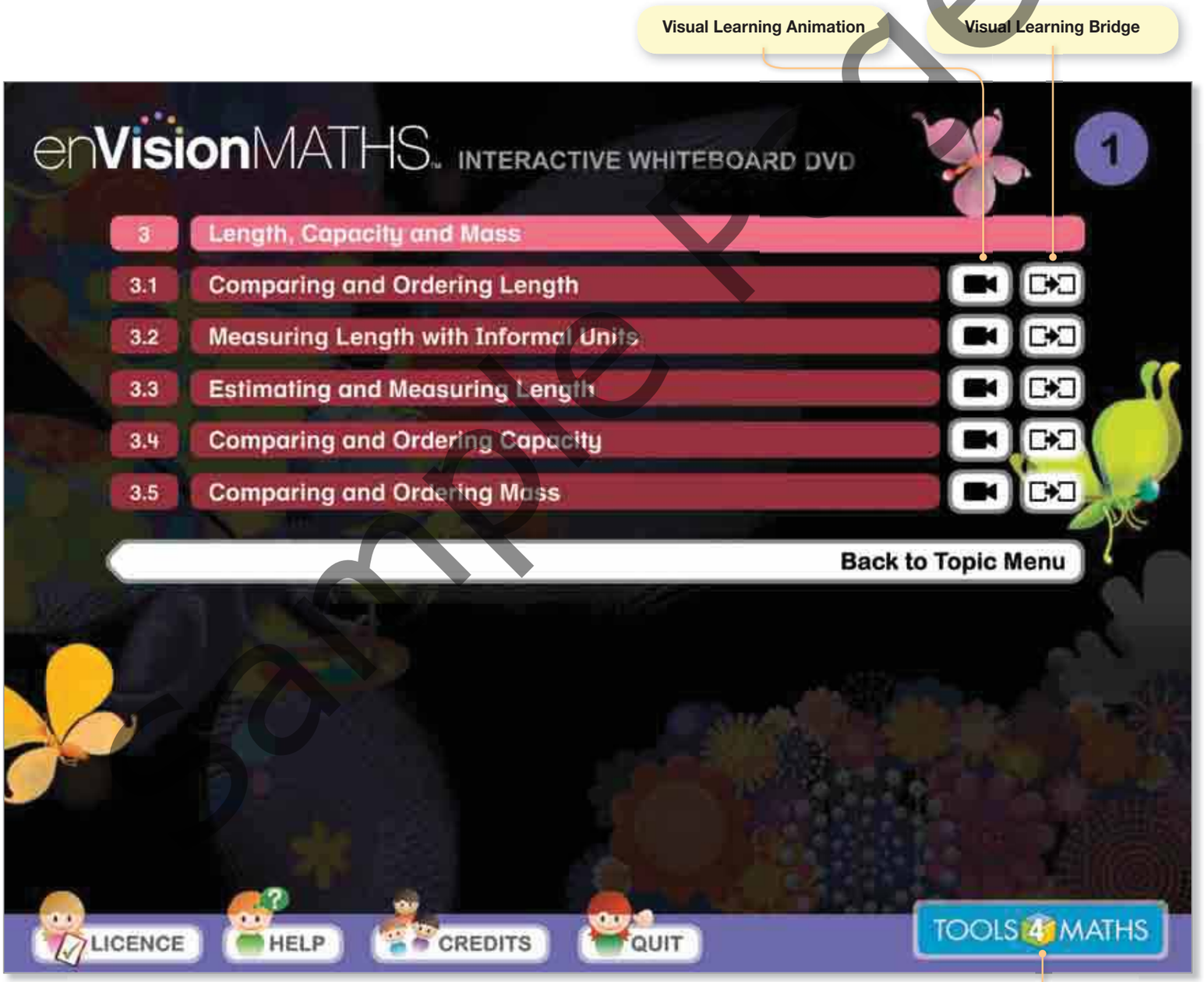
Interactive Whiteboard DVD

The Interactive Whiteboard DVD for year 1 contains the Visual Learning Animations and Bridges for year 1, as well as Tools4Maths.

Teachers introduce each lesson to students through the Visual Learning Animation (VLA) on this DVD. Each lesson then begins with a focus on conceptual understanding through use of the Visual Learning Bridge provided on this DVD and in the Student Activity Books.

Tools4Maths can be used in any number of ways: alongside the Digital Cards in the Activity Zone; as a tool for further explanation or enrichment in whole-class, small-group or individual work; or as individual or group extension activities.

The enVision Digital Cards provide structured formats for students to use Tools4Maths. Students can then explore each of the 11 digital tool sets on their own or with supervision. The tools themselves are neither structured in any order nor related to specific activities, and so provide any number of opportunities for discovery within different mathematics contexts.



Lesson Pages

The Student Activity Book (SAB) has been designed for students to enjoy playing, thinking, practising and writing about maths.

Curriculum Link: shows where this lesson fits into the Australian Curriculum: Mathematics. A small number of pages have links to the Foundation or year 2 curricula, so are revision or extension for year 1.

Lesson title: clearly indicates what the lesson involves.

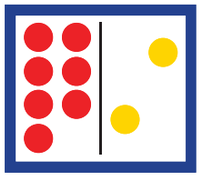
Instructions: instructions have been set in a print style suitable for teachers to read to or with the students.

Topic 2 Lesson 3

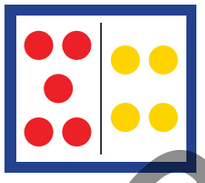
Curriculum Link: NA015

Adding to 8 and 9

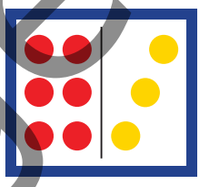
Write the numbers for ● and ●.

1 

7 ● and 2 ●

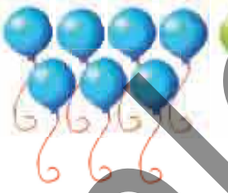
2 

___ ● and ___ ●

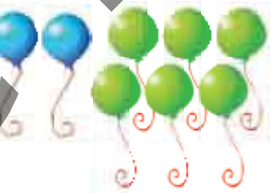
3 

___ ● and ___ ●

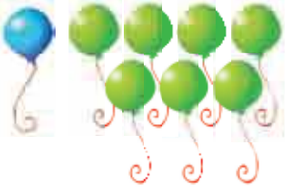
Write the numbers for 🎈 and 🎈.

4 

7 🎈 and ___ 🎈

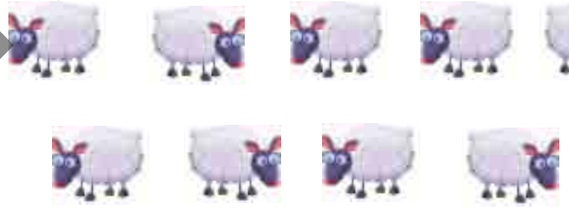
5 

___ 🎈 and ___ 🎈

6 

___ 🎈 and ___ 🎈

7 Draw hats on all the sheep. How many wear  and  ?



___ in total

8 Tammy and Lisa looked through a set of dominoes to find how many had a total of 8 dots.

Tammy said she was sure there were 3 dominoes that have a total of 8 dots.

Lisa said that Tammy was wrong and there are only 2 dominoes with a total of 8 dots.

Who do you think is right? What could you do to find out?

12 twelve

Curriculum Link: NA015

Using the Plus Sign

Topic 2 Lesson 4

Write the number of objects in each group. Trace the plus sign to show joining groups.

1 

2 

3 

4 

5 ◯ + 2 = □

There are many solutions to this problem.

What numbers could the circle and square be?

Topic and lesson identifier

Strand colour: the colour shows which strand is being worked on: Number and Algebra is blue; Measurement and Geometry is pink; and Statistics and Probability is green.

The design of questions allows for working-out space. Students should be encouraged to write or draw their maths thinking in these spaces.

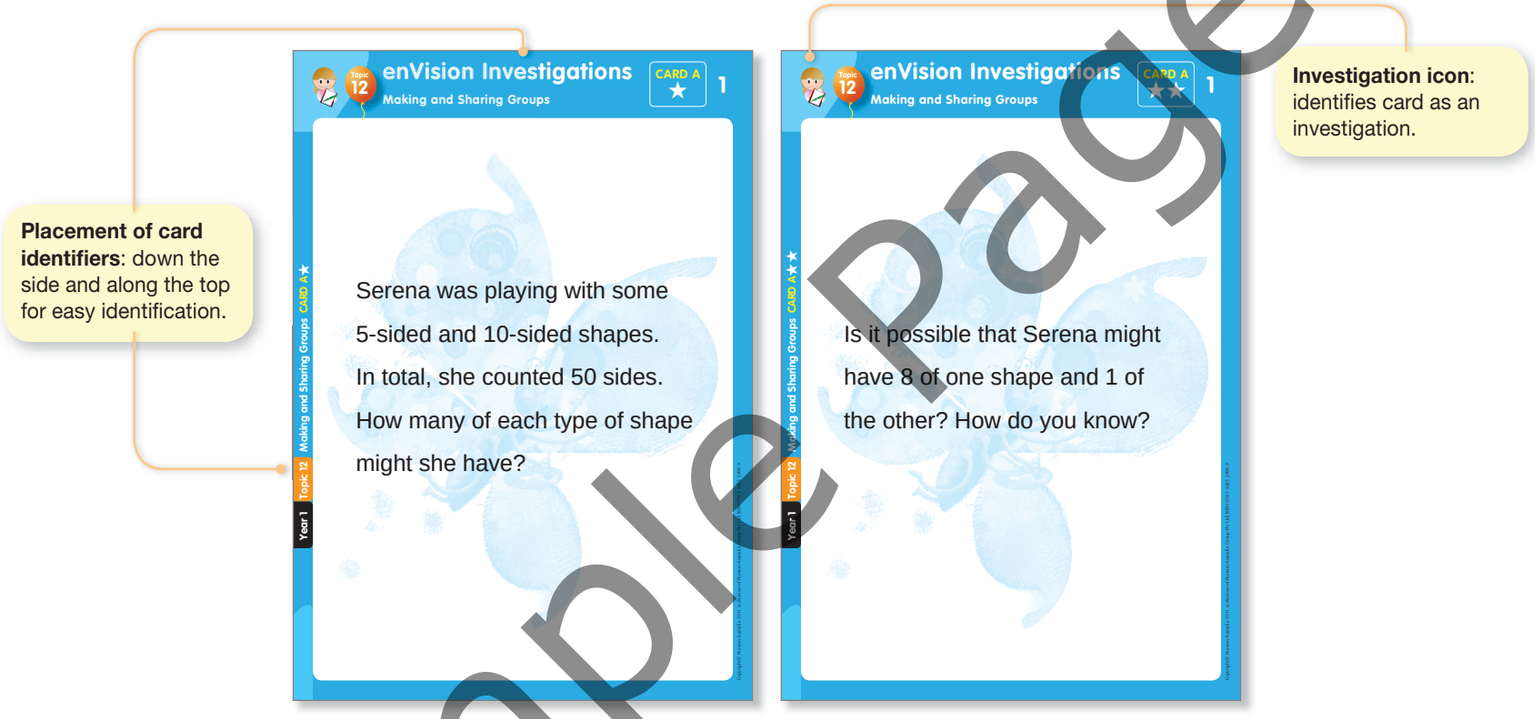
Problem-solving icon: used whenever problem solving is specifically addressed.

Problem solving: Each lesson includes a problem-solving question that students will need to think about and solve.

Activity Zone

The class splits into ability groups to use the Activity Zone. This year 1 class set of investigations, games and digital cards supports the learning of each topic and differentiates the curriculum. Providing ready-made resources that are topic-linked and differentiated saves time for teachers, engages students and is sound pedagogy across Australia. Students record their Activity Zone work in the Maths Thinking Skills Book.

enVision Investigations Cards

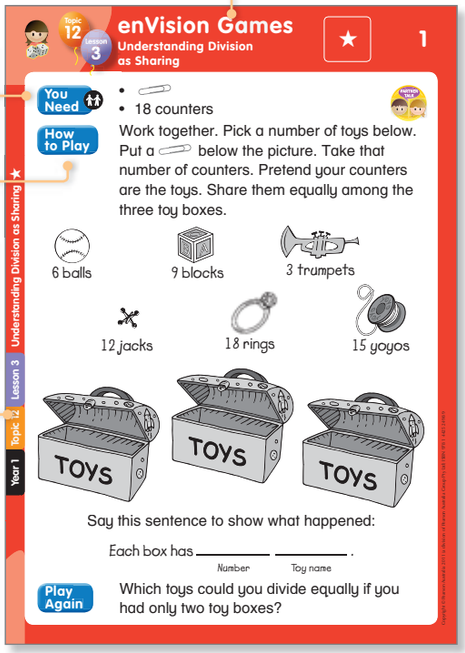


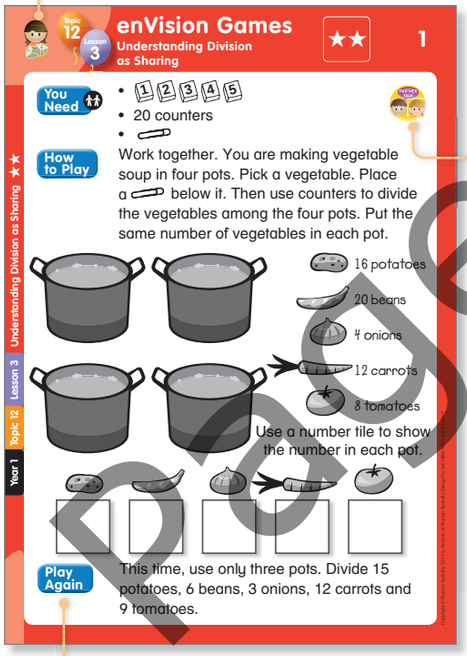
enVision Games Cards

You Need icon: shows at a glance what you need and how many students can play at any one time.

How to Play icon: immediately identifiable instructions. Designed to be read by teacher to or with students.

Placement of card identifiers: down the side and along the top for easy identification.





enVision Games icon: identifies card as part of enVision Games.

Partner Talk: indicates clearly if a partner is needed.

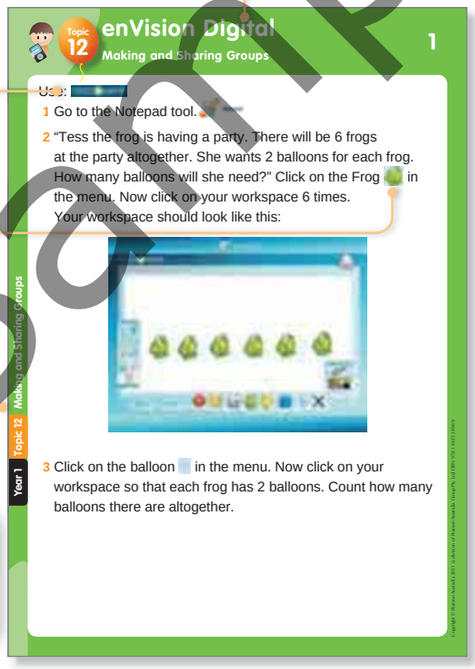
Play again: extension activities.

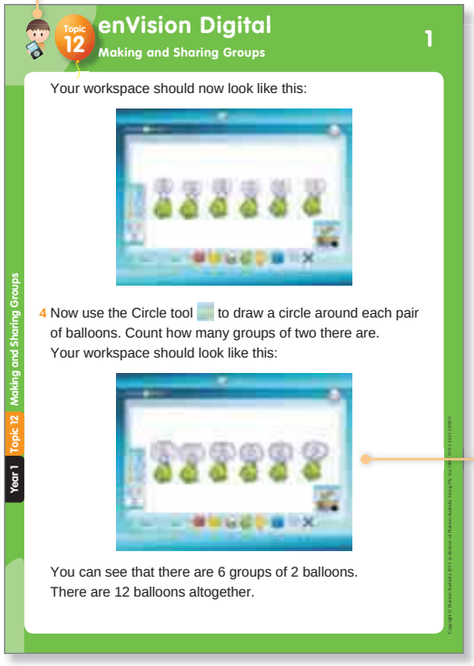
enVision Digital Cards

Tools4Maths icon: indicates the use of Tools4Maths.

Visual representation: of Tools4Maths tools and icons.

Placement of card identifiers: down the side and along the top for easy identification.





enVision Digital icon: identifies card as a digital activity card.

Screen shots: show students what their work should look like at each stage.

Maths Thinking Skills Book

The Maths Thinking Skills Book acts as a student record/ self-reflection journal for each year of the program. There is one book suitable for use in years 3, 4, 5 or 6 and another book suitable for use in years F, 1 or 2.

In these books, students are able to write and draw their own maths thinking. The pages are divided into different colours/sections corresponding to the Activity Zone cards, reflection questions and language presented in each topic.

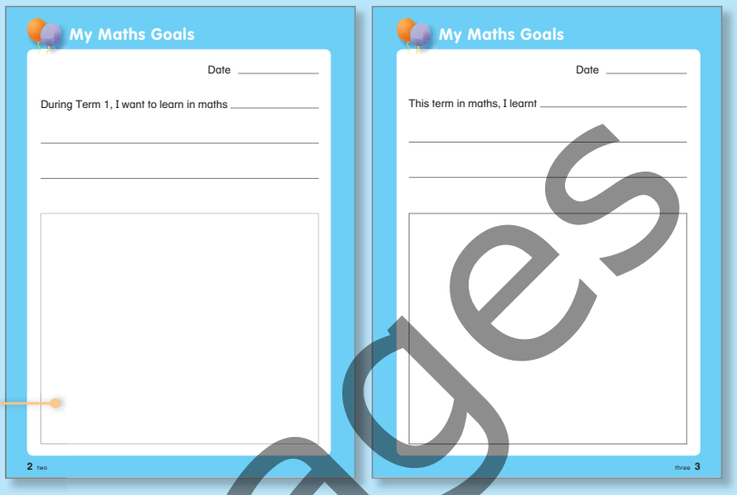
The completed Maths Thinking Skills Book can form a record of that student's maths learning for the year, and can then be used as a self-reflection tool for students and to inform parents and teachers.

My Maths Goals: There are two Maths Goals pages for each school term. Students can record their maths goals at the start of each term and reflect on what they have learnt at the end of each term.

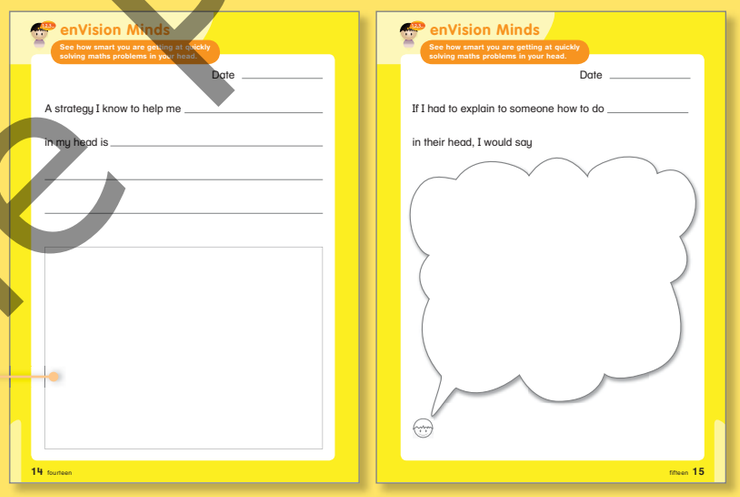
enVision Minds: Students can see how smart they are getting at maths by recording their strategies on these pages.

enVision Investigations: Students record their working out for their chosen investigation in these pages. The first few blue pages have questions to guide students, but as their investigation skills improve, students are able to work on the blank blue pages, setting out their answers in their own way.

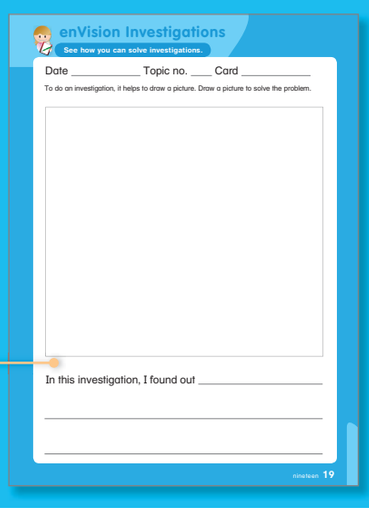
My Maths Goals



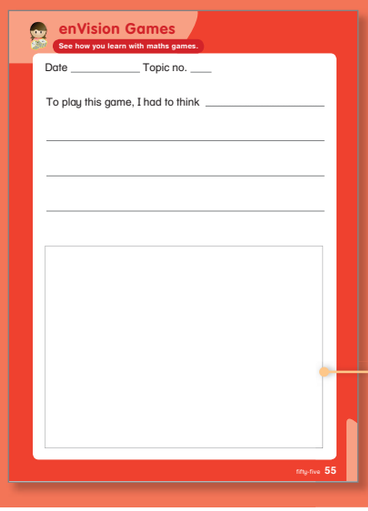
enVision Minds



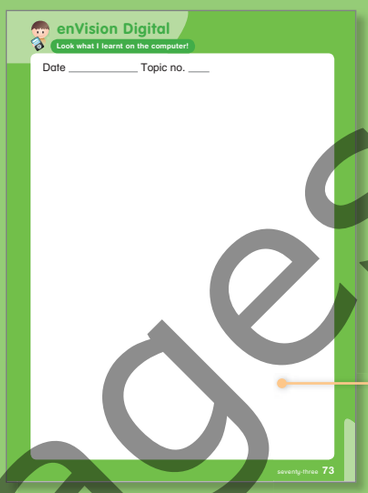
enVision Investigations



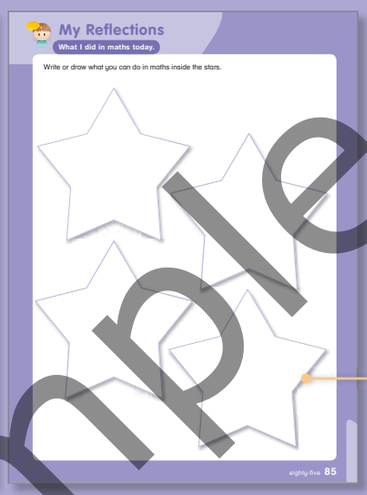
enVision Games



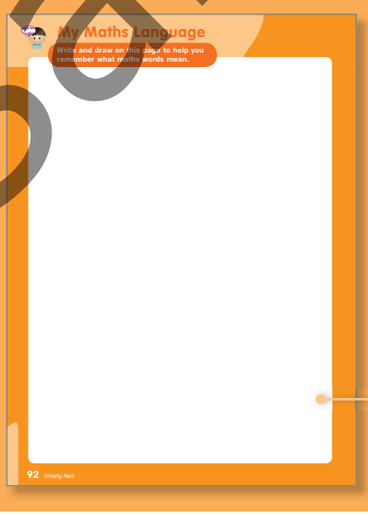
enVision Digital



My Reflections



My Maths Language



enVision Games: Students can record the strategies they use to play the games in these pages. They can also add their own ideas to an enVision game and record the ideas on these pages.

enVision Digital: Students can print out the work they have done on the Digital Cards and paste it into these pages.

My Reflections: Students can record their reflections on their maths learning on these pages. These reflections may be the result of an end-of-lesson reflection activity or a class discussion.

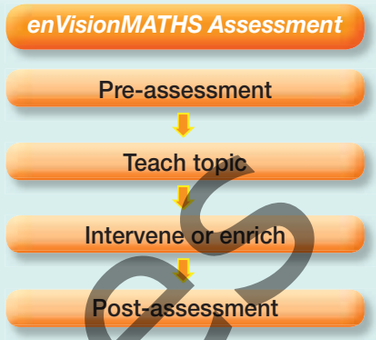
My Maths Language: As students learn new maths language, they can record this vocabulary, together with any diagrams, on this page.

Overview of Assessment

Assessment should be more than merely a test at the end of instruction to see how students perform … it should be an integral part of instruction that informs and guides teachers as they make instructional decisions. Assessment should not merely be done to students; rather it should also be done *for* students, to guide and enhance their learning.

NCTM, 2000, p. 22

The focus of assessment in **enVisionMATHS** is both formative and summative assessment. The formative assessment tools are used to determine students' achievements, resulting in action plans (for both you and the student) in the pursuit of further learning. The summative assessment tools are used to determine an overall measure of achievement at the end of a topic.



The following assessment tools are available for **enVisionMATHS** topics in years F to 2.

Formative Assessment

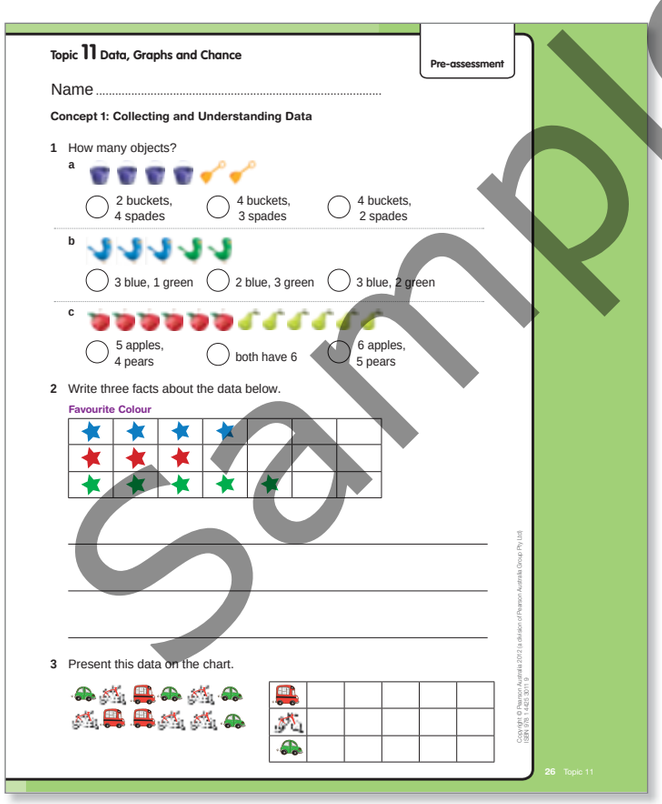
Diagnostic Pre-assessment for each maths concept within the topic

This Pre-assessment helps to gauge the ability of students in a particular area of mathematics, providing information about their strengths and weaknesses. The results of this assessment will guide and support teachers in customising instruction for individual student needs. This form of assessment should be administered at the beginning of each topic. It covers both prerequisite material and new content.

Summative Assessment

Diagnostic Post-assessment for each maths concept within the topic

Post-assessment provides teachers with information about a student's achievement on a particular topic that has just been studied. These results help determine whether an individual student requires revision of, or intervention on, their topic. It also allows teachers to chart a student's progress from the beginning of the topic to the end and gives them information to report back to parents.


Topic 11 Data, Graphs and Chance

Pre-assessment

Name .....

Concept 1: Collecting and Understanding Data

1 How many objects?

a

2 buckets, 4 spades | 4 buckets, 3 spades | 4 buckets, 2 spades

b

3 blue, 1 green | 2 blue, 3 green | 3 blue, 2 green

c

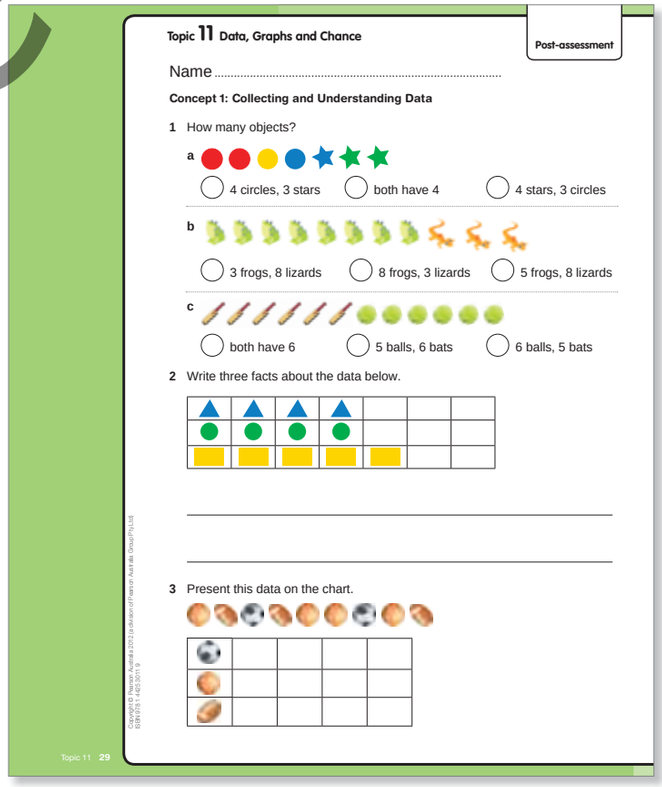
5 apples, 4 pears | both have 6 | 6 apples, 5 pears

2 Write three facts about the data below.

Favourite Colour

3 Present this data on the chart.

26 Topic 11


Topic 11 Data, Graphs and Chance

Post-assessment

Name .....

Concept 1: Collecting and Understanding Data

1 How many objects?

a

4 circles, 3 stars | both have 4 | 4 stars, 3 circles

b

3 frogs, 8 lizards | 8 frogs, 3 lizards | 5 frogs, 8 lizards

c

both have 6 | 5 balls, 6 bats | 6 balls, 5 bats

2 Write three facts about the data below.

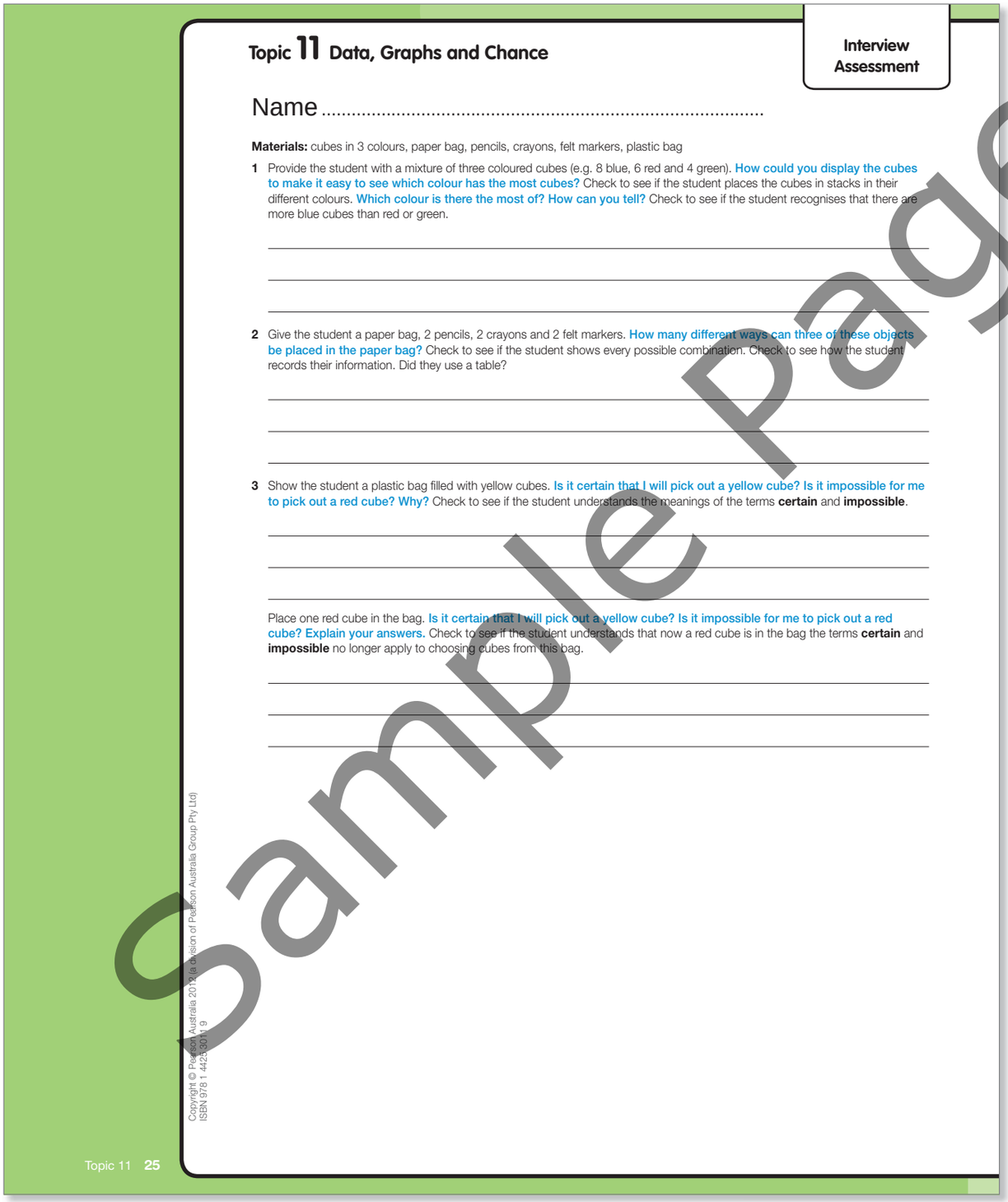
3 Present this data on the chart.

Topic 11 29

The assessments for year 1 are found in the year 1 Teacher Resource Booklets and also on the year 1 Teacher Resource DVD. While teachers may wish to simply photocopy and administer each assessment as it appears in the Teacher Resource Booklet, the DVD format allows teachers to select and print appropriate Interview, Pre- and Post-assessments for any year 1 concept. Assessments for years F and 2 are also provided on the year 1 DVD to allow for differentiated tests to suit individual students.

Interview Assessment

This is a one-on-one informal, oral assessment strategy. Although intended as a pre-assessment, there is also value in using it as a post-assessment.



Topic 11 Data, Graphs and Chance

Interview Assessment

Name .....

Materials: cubes in 3 colours, paper bag, pencils, crayons, felt markers, plastic bag

1 Provide the student with a mixture of three coloured cubes (e.g. 8 blue, 6 red and 4 green). **How could you display the cubes to make it easy to see which colour has the most cubes?** Check to see if the student places the cubes in stacks in their different colours. **Which colour is there the most of? How can you tell?** Check to see if the student recognises that there are more blue cubes than red or green.

2 Give the student a paper bag, 2 pencils, 2 crayons and 2 felt markers. **How many different ways can three of these objects be placed in the paper bag?** Check to see if the student shows every possible combination. Check to see how the student records their information. Did they use a table?

3 Show the student a plastic bag filled with yellow cubes. **Is it certain that I will pick out a yellow cube? Is it impossible for me to pick out a red cube? Why?** Check to see if the student understands the meanings of the terms **certain** and **impossible**.

Place one red cube in the bag. **Is it certain that I will pick out a yellow cube? Is it impossible for me to pick out a red cube? Explain your answers.** Check to see if the student understands that now a red cube is in the bag the terms **certain** and **impossible** no longer apply to choosing cubes from this bag.

Topic 11 25

Overview of Assessment

Concepts for Assessment

The following table lists the maths concepts used in the diagnostic pre-assessments and post-assessments for year 1.

Topic	Concept
1 Numbers and Place Value to and Beyond 20	**1** Counting and Writing Numbers to 20 **2** Counting and Writing Numbers Beyond 20 **3** Comparing Two Numbers **4** Ordering Three Numbers
2 Addition Concepts	**1** Adding to 6 and 7 **2** Adding to 8 and 9 **3** Writing Addition Number Sentences **4** Making Numbers in Different Ways
3 Length, Capacity and Mass	**1** Comparing and Ordering Length **2** Measuring Length with Informal Units **3** Comparing and Ordering Capacity **4** Comparing and Ordering Mass
4 Place Value 10s and 1s and Money	**1** Using Numbers Made with 10s **2** Using Numbers Made with 10s and 1s **3** Counting with 10s and 1s **4** Identifying Features and Values of Coins
5 Addition Strategies	**1** Counting On and One More Strategies **2** Adding Using Doubles and Near Doubles **3** Making 10 to Add 9 **4** Adding Three Numbers
6 Shapes and Objects	**1** Identifying and Understanding Properties of 2D Shapes **2** Understanding Orientation of Shapes **3** Identifying and Sorting 3D Objects
7 Time and Location	**1** Estimating and Ordering Time Length of Events **2** Understanding Hour and Minute Hands **3** Telling and Writing Time to the Hour and Half Hour **4** Giving Directions
8 Subtraction	**1** Using the Minus Sign to Write Subtraction Sentences **2** Finding the Difference **3** Understanding Comparison Stories **4** Finding Missing Parts of 6, 7 and 8 **5** Finding Missing Parts of 10
9 Numbers and Place Value to 100	**1** Making Numbers to 100 **2** Identifying One More, One Less **3** Counting and Comparing Numbers to 100 **4** Identifying Before, After and Between
10 Fractions: Equal Parts of Shapes	**1** Making Equal Parts **2** Identifying Half of a Group **3** Making a Whole
11 Data, Graphs and Chance	**1** Collecting and Understanding Data **2** Making Graphs with Objects **3** Identifying Language of Chance Events
12 Making and Sharing Groups	**1** Identifying Groups **2** Using Groups of 2, 5 and 10 **3** Understanding Division as Sharing
13 Patterns	**1** Predicting and Extending Patterns **2** Counting Patterns of 2, 5 and 10 **3** Understanding Odd and Even Numbers

Assessment Formats

Each of the diagnostic assessments incorporates a range of assessment styles. Different approaches to, and formats for, assessment are required to measure the mathematical knowledge, skills and attitudes of students.

Multiple-choice (Question 1)

Multiple-choice assessment is helpful in implementing a quick and practical assessment task for students. These tests measure students' levels of mathematical fluency and allow for a quick and direct opportunity for identifying strengths and weaknesses in students' maths ability. The multiple-choice style of assessment also reflects that which is used for NAPLAN at Years 3, 5, 7 and 9.

Short answer (free-response) (Question 2)

Free-response assessment helps to eliminate students guessing the correct answer. Students answer a question and may have the opportunity to represent their answer pictorially.

These questions can be more open-ended but should not be too wordy as they could restrict some students' access to maths learning due to language barriers.

Problem solving (Question 3)

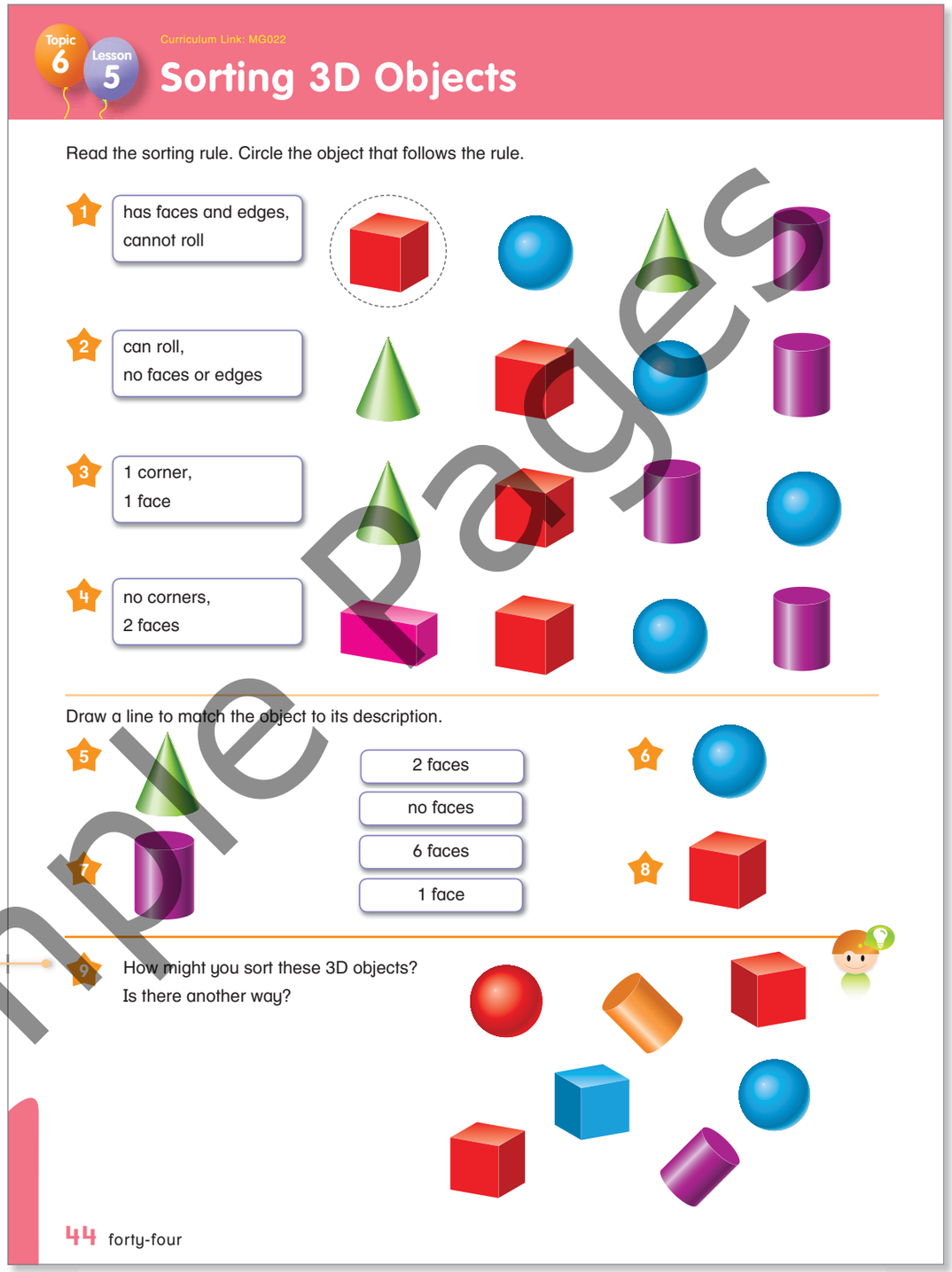
Problem-solving assessment allows students to demonstrate their problem-solving skills by applying various mathematical problem-solving techniques to non-routine problems. Students are assessed on how they organise information, decode graphic representations, make generalisations and justify conclusions from data.

The problem-solving assessment questions appear together at the end so students are challenged to think about which maths tools or processes they need to apply to formulate their answers.

Overview of Assessment

Problem Solving

Students demonstrate their problem-solving skills by applying various mathematical techniques to non-routine problems. Students are assessed on how they organise information, decode graphic representations, make generalisations and justify conclusions from data. The problem-solving question appears at the end of the lesson so students are challenged to think about which maths tools or processes they need to apply to formulate their answer.



Topic 6 Lesson 5

Curriculum Link: MG022

Sorting 3D Objects

Read the sorting rule. Circle the object that follows the rule.

1. has faces and edges, cannot roll
2. can roll, no faces or edges
3. 1 corner, 1 face
4. no corners, 2 faces

Draw a line to match the object to its description.

5.
6.
7.
8.

2 faces
no faces
6 faces
1 face

Problem Solving

9. How might you sort these 3D objects? Is there another way?

44 forty-four

Problem Solving

Students need a lot of kinaesthetic experiences and manipulation with a variety of 2D shapes and 3D objects so that they can learn to identify, sort and describe properties. Experiences in changing the orientation of shapes and objects will develop visualisation. Understanding of symmetry comes from folding shapes on a line that makes both sides exactly the same (a mirror reflection). Opportunities for describing shapes and objects are important in developing the correct mathematical language of shapes and objects.

The following information is for use alongside the problem-solving activities in the Student Activity Book.

1:6-1 Understanding Properties of 2D Shapes

Multiple shapes may be found. Did students find varied shapes? Share their findings. Extend the problem by asking students how else they could sort their shapes.

1:6-2 Identifying 2D Shapes

Drawings will vary. This is reverse thinking. Normally we ask students to find things that do have four sides. List all the things students came up with.

1:6-3 Understanding Orientation of Shapes

Answers will vary. Did students recognise that the three triangles are exactly the same but turned around? Do they understand that shapes are the same size and shape if they fit on top of one another, despite their orientation?

1:6-4 Identifying 3D Objects

Answers will vary. How many reasons did students think of? Examples include: the ball is a sphere so that it will roll and bounce and so it is easy to throw and catch; the tissue box is a rectangular prism so that it is easy to stack on a shelf or inside a bigger box for transport.

1:6-5 Sorting 3D Objects

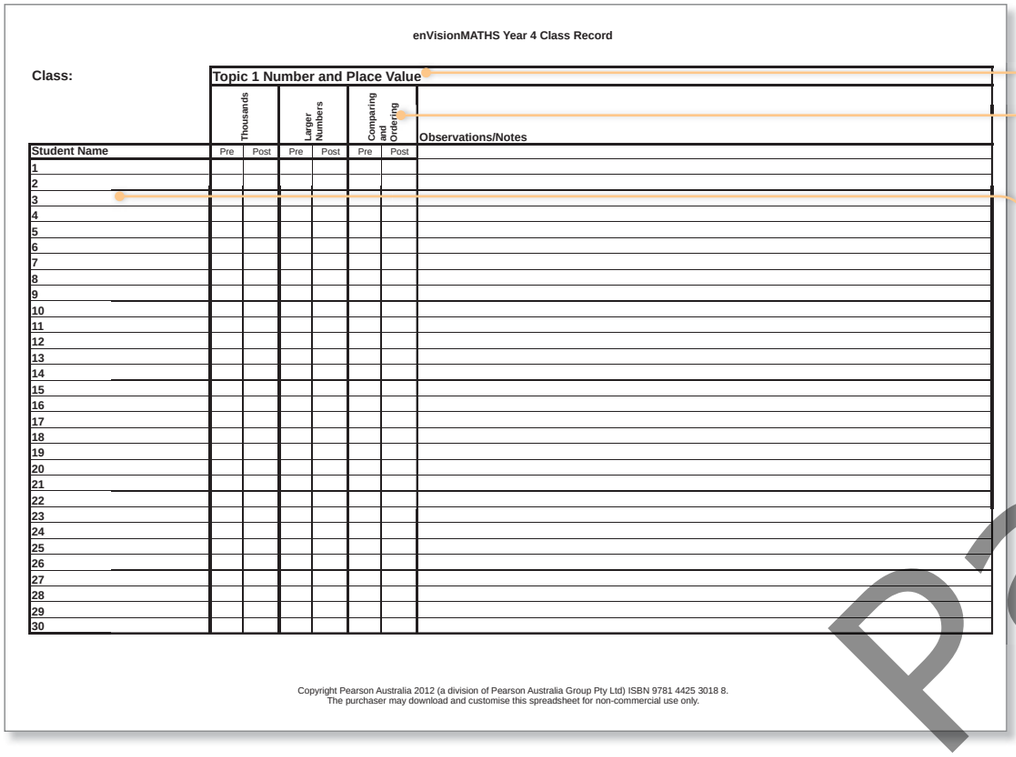
Answers will vary. Ask students to describe their groups. Did they use correct language such as **spheres**, **cylinders**, **cubes**? Did they think to use more than two groups? An interesting idea is to model a Venn diagram showing 3D objects with flat sides, 3D objects with no flat sides and in the intersection 3D objects with both.

Answers and discussion of Problem-solving questions are shown on the corresponding Teacher Resource page.

Self-assessment: Maths Thinking Skills Book

A record of each student's maths thinking can be recorded in the various sections of the Maths Thinking Skills Book. This includes self-assessment through reflection activities that are suggested in each lesson topic.

Assessment Recording



enVisionMATHS Year 4 Class Record

Class:

	Topic 1 Number and Place Value						
	Thousands		Larger Numbers		Comparing and Ordering		
Student Name	Pre	Post	Pre	Post	Pre	Post	Observations/Notes
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

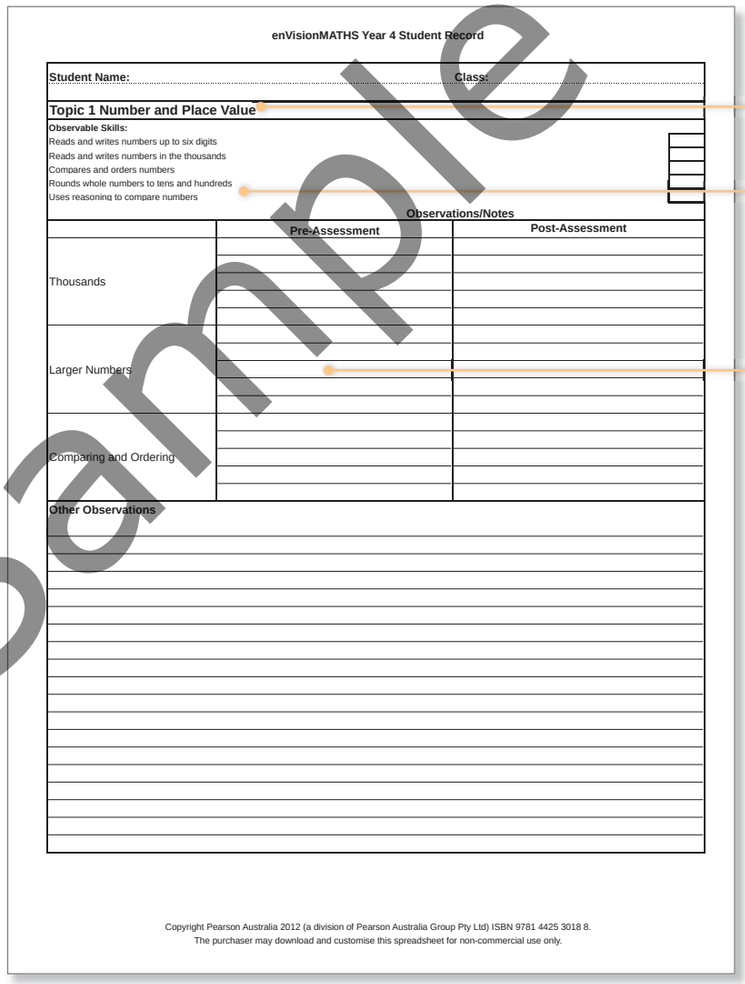
Class and Student Record templates are provided within the planning documents on the year 1 Teacher Resource DVD.

These are Microsoft® Excel® documents that can be tailored for individual class needs. They have been arranged by **enVisionMATHS** topic and assessment concept, with space for teachers to record notes or add formulae, as appropriate.

Topic name

Assessment concepts

Student names: once a student's name is entered in Topic 1, the name will automatically appear in the Class Record for all other year 1 topics.



enVisionMATHS Year 4 Student Record

Student Name: Class:

Topic 1 Number and Place Value

Observable Skills:
Reads and writes numbers up to six digits
Reads and writes numbers in the thousands
Compares and orders numbers
Rounds whole numbers to tens and hundreds
Uses reasoning to compare numbers

Observations/Notes

	Pre-Assessment	Post-Assessment
Thousands		
Larger Numbers		
Comparing and Ordering		

Other Observations

Topic name

Observable skills for the topic

Assessment concepts

Scope and Sequence

Australian Curriculum Reference	enVisionMATHS Scope and Sequence		
	Foundation	Year 1	Year 2
	Number and Algebra		
Number and place value	**3.1** Counting and Writing 1, 2 and 3 **3.2** Counting and Writing 4 and 5 **3.3** Identifying One More Than **3.4** Reading and Writing 0 **3.5** Counting and Writing 6 and 7 **3.6** Counting and Writing 8 and 9 **3.7** Counting and Writing 10 **3.8** Ordering Numbers on a Number Line **3.9** Comparing Numbers to 10 **5.1** Adding Groups **5.2** Making Numbers in Different Ways **5.3** Adding to 4 and 5 **5.4** Adding to 6 and 7 **5.5** Adding to 8 and 9 **5.6** Adding to 10 **5.7** Using Objects to Add **9.1** Revising 10 **9.2** Counting and Writing 11 and 12 **9.3** Counting and Writing 13, 14 and 15 **9.4** Counting and Writing 16 and 17 **9.5** Counting and Writing 18 and 19 **9.6** Counting and Writing 20 **10.1** Identifying and Creating Groups **10.2** Identifying More Than One Group **10.3** Sharing Objects **10.4** Sharing Equally **12.1** Skip Counting by 5s **12.2** Skip Counting by 2s **12.3** Counting Groups of 10 **12.4** Counting Backwards **12.5** Looking for a Pattern **12.6** Understanding Ordinal Numbers **13.1** Acting Out Subtraction Stories **13.2** Understanding Separation Stories **13.3** Understanding Take Away Stories **13.4** Understanding Comparison Stories	**1.1** Counting and Writing Numbers 0 to 5 **1.2** Counting and Writing Numbers 6 to 10 **1.3** Counting and Writing Numbers 10, 11, 12 **1.4** Counting and Writing Numbers 13 to 19 **1.5** Counting and Writing Numbers to 20 **1.6** Ordering Numbers Using a Number Line **1.7** Counting Beyond 20 **1.8** Comparing Two Numbers **1.9** Ordering Three Numbers **2.1** Drawing Addition Stories **2.2** Adding to 6 and 7 **2.3** Adding to 8 and 9 **2.4** Using the Plus Sign **2.5** Writing Addition Number Sentences **2.6** More Addition Number Sentences **2.7** Making Numbers in Different Ways **4.1** Representing Numbers on a Ten Frame **4.2** Understanding Parts of 10 **4.3** Using Numbers Made With 10s **4.4** Using Numbers With 10s and 1s **4.5** Counting with 10s and 1s **4.6** Writing Numbers in Different Ways **5.1** Counting On **5.2** Adding 1 More **5.3** Adding Doubles **5.4** Using Near Doubles to Add **5.5** Adding More Near Doubles **5.6** Showing Addition Facts on a Ten Frame **5.7** Making 10 on a Ten Frame **5.8** Making 10 to Add 9 **5.9** Adding Three Numbers **5.10** Adding With 0 **8.1** Using the Minus Sign **8.2** Finding Difference **8.3** Writing Subtraction Sentences **8.4** Understanding Comparison Stories **8.5** Subtracting with 0, 1 and 2	**1.1** Counting and Writing Numbers 11 to 20 **1.2** Counting by 10s **1.3** Using Models for 10s and 1s **1.4** Reading and Writing Numbers to 99 **1.5** Using Models to Compare Numbers **1.6** Identifying Before, After and Between **1.7** Ordering Numbers **1.8** Ordering Numbers on a Hundred Chart **1.9** Making 100 **1.10** Counting by 10s Past 100 **2.1** Writing Addition Number Sentences **2.2** Understanding Addition Stories **2.3** Understanding More Addition Stories **2.4** Adding in Any Order **2.5** Adding 0, 1 and 2 **2.6** Adding Using Doubles **2.7** Adding Using Near Doubles **2.8** More Adding in Any Order **2.9** Making 10 to Add Two Numbers **2.10** Adding Three Numbers **3.1** Identifying Missing Parts **3.2** Writing Subtraction Number Sentences **3.3** Using Separation Stories **3.4** Using Comparison Stories **3.5** Subtracting 0, 1 and 2 **3.6** Drawing Subtraction Stories **3.7** Using Doubles Facts to Subtract **3.8** Using Addition to 10 to Subtract **4.3** Skip Counting **4.4** Understanding Odd and Even Numbers **4.5** Understanding Ordinal Numbers **11.1** Multiplication as Repeated Addition **11.2** Writing Multiplication Stories **11.3** Building Arrays Using Counters **11.4** Building Arrays Using Pictures **11.5** Understanding Division as Sharing **11.6** Writing Division Stories

Scope and Sequence

enVisionMATHS Scope and Sequence

Number and Algebra

Year 3	Year 4	Year 5	Year 6
1.1 Reading and Writing Hundreds	**1.1** Reading and Writing Thousands	**1.1** Representing Thousands in Different Ways	**1.1** Representing Millions in Different Ways
1.2 Reading and Writing Numbers to 1 000	**1.2** Reading and Writing Larger Numbers	**1.2** Representing Millions in Different Ways	**1.2** Comparing and Ordering Whole Numbers
1.3 Building Numbers Beyond 1 000	**1.3** Comparing and Ordering Whole Numbers	**1.3** Comparing and Ordering Whole Numbers	**1.3** Understanding Positive and Negative Numbers
1.4 Understanding Odd and Even Numbers	**1.4** Rounding Whole Numbers	**2.1** Using Mental Maths to Find Missing Parts	**1.7** Multiplying and Dividing by 10, 100 and 1 000
1.5 Using Clues to Identify Numbers	**2.1** Using Mental Maths to Add	**2.2** Rounding and Estimating Whole Numbers	**2.1** Understanding Commutative and Associative Properties of Addition
1.6 Using Place Value to Add and Subtract	**2.2** Using Models to Add 3-Digit Numbers	**2.3** Using Mental Strategies to Add and Subtract	**2.2** Understanding Multiplication Properties
1.7 Ordering Three Numbers	**2.3** Adding Whole Numbers	**2.4** Adding and Subtracting Large Numbers	**2.3** Using the Distributive Property
1.8 Comparing Numbers	**2.4** Adding Three or More Numbers	**3.6** Asking Questions to Solve Multiple-Step Problems	**2.4** Using Mental Maths to Apply Properties of Operations
1.9 Rounding Whole Numbers	**2.5** Using Diagrams to Connect Addition and Subtraction	**4.1** Finding Factors Using Multiplication	**2.5** Understanding Properties and Relationships Between Operations
2.1 Using Mental Maths to Make 10	**3.1** Using Models to Subtract 2-Digit Numbers	**4.2** Understanding Multiplication Properties	**2.6** Finding Elapsed Time
2.2 Adding Tens to a 2-Digit Number	**3.2** Subtracting on a Hundred Chart	**4.3** Multiplying with Three Factors	**2.7** Using Mental Maths to Multiply
2.3 Adding Tens	**3.3** Subtracting 2-Digit Numbers	**4.4** Multiplying 2-Digit by 1-Digit Numbers	**2.8** Using Mental Maths to Multiply and Divide
2.4 Adding Tens and Ones	**3.4** Using Models to Subtract 3-Digit Numbers	**4.5** Using Mental Maths to Multiply	**2.9** Dividing with 1 and 0
2.5 Using Models to Add	**3.5** Subtracting 3-Digit Numbers	**4.6** Identifying Missing or Extra Information	**2.10** Relating Factors and Divisibility
2.6 Add 9 by Adding 10	**3.7** Subtracting With Zero	**5.1** Understanding Factors	**2.12** Using Operations to Solve Problems
2.7 Adding Larger Numbers	**3.8** Subtracting With More Than One Zero	**5.2** Using Patterns to Divide	**3.1** Looking for Patterns in a Decimal Chart
2.8 Adding More Than Two Numbers	**3.9** Solving Subtraction Problems in Two Steps	**5.3** Dividing 3-Digit by 1-Digit Numbers	**6.1** Understanding Prime and Composite Numbers
3.1 Identifying the Missing Part	**4.1** Using Arrays to Multiply	**5.4** Dividing Using Zeroes	**6.2** Identifying Prime Factors
3.3 Reasons to Subtract	**4.2** Using Arrays to Multiply with 4 and 8	**5.5** Understanding Remainders	**6.3** Finding Common and Greatest Common Factors
3.4 Using Addition to 20 to Subtract	**4.3** Using Arrays to Multiply with 3, 6 and 9	**5.6** Dividing with Remainders	**6.4** Finding Greatest Common Factors
3.5 Subtracting Tens	**4.4** Multiplying in Any Order	**5.7** Connecting Models with Symbols	**6.6** Drawing a Diagram to Solve an Equation
3.6 Sorting Tens on a Hundred Chart	**4.5** Solving Multiplication Problems in Two Steps	**5.8** Checking for Reasonableness in Division Problems	**6.7** Understanding Properties of Equality
3.7 Subtracting on a Hundred Chart	**4.6** Using Mental Maths to Multiply		**6.8** Solving Addition and Subtraction Equations
3.8 Estimating Differences	**4.7** Recording Multiplication in Different Ways		**6.10** Identifying Square and Triangular Numbers
5.1 Representing Multiplication	**4.8** Multiplying 2-Digit by 1-Digit Numbers		**8.6** Finding the Percentage of a Number
5.2 Writing Multiplication Sentences	**4.9** Multiplying by Multiples of 10 and 100		**8.7** Checking for Reasonableness in Percentage Problems
5.3 Using Arrays to Show Multiplication	**7.1** Using Diagrams to Divide		
5.4 Solving Multiplication Problems	**7.2** Using a Table to Show Division		
5.5 Using Number Patterns to Multiply	**7.3** Using Materials to Divide 2-Digit Numbers		
8.1 Understanding Division as Sharing	**7.4** Relating Multiplication and Division Facts		
8.2 Writing Division Stories			
8.3 Relating Division to Multiplication			
8.4 Representing Money Values Using Division			
9.5 Identifying Patterns for Multiples			
13.1 Using Mental Strategies to Subtract			
13.2 Using a Number Line to Subtract 2-Digit Numbers			
13.3 Using Models to Subtract 2-Digit Numbers			

Scope and Sequence

Australian Curriculum Reference	enVisionMATHS Scope and Sequence		
	Foundation	Year 1	Year 2
Number and Algebra			
Number and place value (cont.)		**8.6** Finding Missing Parts of 8 **8.7** Finding Missing Parts of 6 and 7 **8.8** Finding Missing Parts of 10 **8.9** Writing More Subtraction Sentences **9.1** Making Numbers to 100 **9.2** Identifying One More, One Less **9.3** Counting to 100 **9.4** Comparing Numbers **9.5** Identifying Before, After and Between **9.6** Ordering Numbers on a Number Line **12.1** Identifying Groups **12.2** Using Groups of 2, 5 and 10 **12.3** Understanding Division as Sharing **13.5** Counting Patterns of 2, 5 and 10 **13.6** Understanding Odd and Even Numbers **13.7** Identifying Patterns on a Hundred Chart	**11.7** Relating Multiplication and Division **12.1** Adding Groups of Tens **12.2** Counting 10 More Than, 10 Less than **12.3** Comparing Numbers **12.4** Understanding Place Value up to 1 000 **12.5** Building 1 000 **12.6** Using Numbers to 1 000 **12.7** Ordering Numbers to 1 000
Fractions and decimals		**10.1** Folding In Half **10.2** Making Equal Parts **10.3** Identifying Half of a Group **10.4** Using Different Attributes to Find Half **10.5** Making a Whole	**7.1** Identifying Parts of Collections **7.2** Drawing Pictures of Fractions **7.3** Identifying Equal Parts **7.4** Naming One Part of a Whole **7.5** Naming Fractions of Collections

enVisionMATHS Scope and Sequence

Year 3	Year 4	Year 5	Year 6
Number and Algebra			
13.4 Using Written Methods to Subtract 2-Digit Numbers **13.5** Using Other Mental Strategies to Subtract **13.6** Using Addition to Check Subtraction **13.7** Solving Two-step Problems	**7.5** Using Inverse Operations **7.6** Using Multiplication Facts to Find Division Facts **7.7** Using Mental Maths to Divide **7.8** Dividing Multiples of 10, 100 and 1 000 **7.9** Dividing With 2-Digit Numbers **7.10** Dividing With Remainders **8.1** Looking for a Pattern **8.2** Looking for a Pattern to Solve a Problem **8.5** Working Backwards to Solve Problems **8.7** Finding Equality		
11.1 Dividing a Whole into Equal Parts **11.2** Writing Fractions of a Whole **11.3** Naming Groups Using Fractions **11.4** Finding Equivalent Fractions **11.5** Finding a Fraction of a Group **11.6** Explaining Fractions	**9.1** Using Fractions to Name Parts of Wholes or Sets **9.2** Writing a Maths Explanation **9.3** Finding Equivalent Fractions **9.4** Finding More Equivalent Fractions **9.5** Defining Fractions **9.6** Using Improper Fractions and Mixed Numbers **9.7** Representing Tenths and Hundredths as Decimals **9.8** Writing Fractions and Decimals	**1.4** Representing Decimals in Different Ways **1.5** Comparing Decimals **1.6** Comparing and Ordering Decimals **1.7** Ordering Decimals on a Number Line **1.8** Writing Fractions as Decimals—Tenths **1.9** Writing Fractions as Decimals—Hundredths **1.10** Ordering Fractions on a Number Line **1.11** Ordering Fractions and Decimals on a Number Line **1.12** Extending Beyond Hundredths **3.1** Writing Fractions and Decimals **3.2** Using Number Lines to Represent Fractions and Decimals **3.3** Comparing Fractions **3.4** Finding Equivalent Fractions **3.5** Ordering Mixed Numbers and Decimals on a Number Line **3.6** Asking Questions to Solve Multiple-Step Problems	**1.4** Using Decimals **1.5** Understanding Decimal Place Value **1.6** Comparing and Ordering Decimals **1.7** Multiplying and Dividing by 10, 100 and 1 000 **3.2** Estimating Sums and Differences **3.3** Multiplying Decimals by 10, 100 or 1 000 **3.4** Multiplying Decimals **3.5** Dividing Decimals by 10, 100 or 1 000 **3.6** Using Models and Number Lines to Add and Subtract Decimals **3.7** Adding and Subtracting Decimals **3.8** Multiplying a Whole Number by a Decimal **3.9** Dividing a Decimal by a Whole Number **5.1** Expressing a Fraction as a Whole Number **5.2** Representing Fractions in Different Ways **5.3** Using Fractions to Represent Division **5.4** Using Models to Compare Fractions **5.5** Finding Equivalent Fractions

Scope and Sequence

Australian Curriculum Reference	enVisionMATHS Scope and Sequence		
	Foundation	Year 1	Year 2
Number and Algebra			
Fractions and decimals (cont.)			
Money and financial mathematics		**4.7** Identifying Features and Values of Coins **4.8** Recognising the Values of Coins **13.5** Counting Patterns of 2, 5 and 10	**9.1** Counting Collections of Coins **9.2** Showing the Same Amount in Different Ways **9.3** Making Larger Amounts **9.4** Estimating Sums **9.5** Recognising and Counting Notes and Coins **9.6** Using Money
Patterns and algebra	**1.1** Classifying Shapes and Objects **1.2** Sorting by One Attribute **1.3** Sorting in Different Ways **1.4** Sorting by More Than One Attribute **1.5** Sorting Using Logical Reasoning **8.1** Identifying Sound and Other Patterns **8.2** Identifying Colour Patterns	**13.1** Describing Patterns **13.2** Using Patterns to Predict **13.3** Extending Shape Patterns **13.4** Using More Patterns to Predict **13.7** Identifying Patterns on a Hundred Chart	**1.10** Counting by 10s Past 100 **2.2** Understanding Addition Stories **2.3** Understanding More Addition Stories **2.5** Adding 0, 1 and 2 **2.6** Adding Using Doubles **2.7** Adding Using Near Doubles **2.8** More Adding in Any Order

enVisionMATHS Scope and Sequence

Number and Algebra

Year 3	Year 4	Year 5	Year 6
		7.1 Using Models to Add Fractions **7.2** Using Models to Subtract Fractions **7.3** Adding and Subtracting Fractions with Like Denominators **7.4** Adding Mixed Numbers with Like Denominators	**5.6** Writing Fractions in Simplest Form **5.7** Ordering Fractions **5.8** Writing Equivalent Fractions and Decimals **5.9** Understanding Improper and Mixed Number Fractions **5.10** Comparing and Ordering Fractions and Mixed Number Fractions **7.1** Adding and Subtracting Fractions with Like Denominators **7.2** Adding Fractions with Related Denominators **7.3** Subtracting Fractions with Related Denominators **7.4** Adding and Subtracting Fractions with Related Denominators **7.5** Adding Mixed Numbers with Related Denominators **7.6** Subtracting Mixed Numbers **8.1** Understanding Percentage **8.2** Using Models to Represent Percentage **8.3** Relating Fractions, Decimals and Percentage **8.4** Expressing Percentages Greater Than 100 and Less Than 1 **8.5** Estimating Percentage **8.6** Finding the Percentage of a Number
2.4 Adding Tens and Ones **8.4** Representing Money Values Using Division	**3.10** Calculating Change from Money	**10.4** Solving Money-Related Problems	**8.5** Estimating Percentage **8.6** Finding the Percentage of a Number **8.7** Checking for Reasonableness in Percentage Problems
3.2 Drawing Subtraction Stories **9.1** Continuing a Pattern **9.2** Finding a Rule for a Pattern **9.3** Using Tables to Identify Patterns **9.4** Extending Tables **9.6** Writing to Explain How to Use Patterns **9.7** Using Addition and Subtraction Expressions	**2.5** Using Diagrams to Connect Addition and Subtraction **3.5** Subtracting 3-Digit Numbers **3.6** Drawing a Diagram to Solve Subtraction Problems **4.2** Using Arrays to Multiply with 4 and 8 **4.3** Using Arrays to Multiply with 3, 6 and 9	**4.2** Understanding Multiplication Properties **4.3** Multiplying with Three Factors **4.4** Multiplying 2-Digit by 1-Digit Numbers **4.5** Using Mental Maths to Multiply **4.6** Identifying Missing or Extra Information	**2.7** Using Mental Maths to Multiply **2.8** Using Mental Maths to Multiply and Divide **2.9** Dividing with 1 and 0 **2.11** Ordering Operations **3.1** Looking for Patterns in a Decimal Chart **6.5** Writing Algebraic Expressions

Scope and Sequence

Australian Curriculum Reference	enVisionMATHS Scope and Sequence		
	Foundation	Year 1	Year 2
Number and Algebra			
Patterns and algebra (cont.)	**8.3** Identifying Shape Patterns **8.4** Comparing Patterns **8.5** Creating Patterns		**2.9** Making 10 to Add Two Numbers **2.10** Adding Three Numbers **3.2** Writing Subtraction Number Sentences **3.3** Using Separation Stories **3.4** Using Comparison Stories **3.5** Subtracting 0, 1 and 2 **3.6** Drawing Subtraction Stories **3.7** Using Doubles Facts to Subtract **3.8** Using Addition to 10 to Subtract **4.1** Revising Shape Patterns **4.2** Identifying Number Patterns **4.3** Skip Counting **9.4** Estimating Sums **12.2** Counting 10 More Than, 10 Less than **12.6** Using Numbers to 1 000 **12.7** Ordering Numbers to 1 000
Measurement and Geometry			
Using units of measurement	**4.1** Comparing and Ordering Size **4.2** Comparing Length **4.3** Ordering by Length **4.4** Ordering Many Objects by Length **4.5** Measuring Length with Informal Units **4.6** Measuring Length with Cubes **4.7** Comparing Capacity **4.8** Comparing Mass **7.1** Reasoning to Find Times of the Day **7.2** Ordering Events **7.3** Understanding More Time, Less Time	**3.1** Comparing and Ordering Length **3.2** Measuring Length with Informal Units **3.3** Estimating and Measuring Length **3.4** Comparing and Ordering Capacity **3.5** Comparing and Ordering Mass **7.1** Estimating and Ordering Time Lengths **7.2** Understanding Times of Events **7.3** Understanding Hour and Minute Hands **7.4** Telling and Writing Time to the Hour **7.5** Telling and Writing Time to Half an Hour	**5.1** Estimating Time **5.2** Telling and Writing Time to the Half Hour **5.3** Telling and Writing Time to the Quarter Hour **5.4** Understanding Months and Seasons **5.5** Using a Calendar **8.1** Exploring Length **8.2** Reasoning About Measurement **8.3** Estimating and Comparing Length Using Metres **8.4** Understanding Length Around

enVisionMATHS Scope and Sequence

Number and Algebra

Year 3	Year 4	Year 5	Year 6
	4.4 Multiplying in Any Order **4.5** Solving Multiplication Problems in Two Steps **4.8** Multiplying 2-Digit by 1-Digit Numbers **4.9** Multiplying by Multiples of 10 and 100 **7.1** Using Diagrams to Divide **7.2** Using a Table to Show Division **7.3** Using Materials to Divide 2-Digit Numbers **7.6** Using Multiplication Facts to Find Division Facts **7.7** Using Mental Maths to Divide **7.8** Dividing Multiples of 10, 100 and 1 000 **7.9** Dividing With 2-Digit Numbers **7.10** Dividing With Remainders **8.1** Looking for a Pattern **8.2** Looking for a Pattern to Solve a Problem **8.3** Describing Geometric Patterns Using a Table **8.4** Using Expressions to Find Missing Numbers **8.5** Working Backwards to Solve Problems **8.6** Using Multiplication and Division Expressions **8.7** Finding Equality **8.8** Identifying Equal or Unequal Number Sentences **10.6** Understanding Temperature	**4.7** Using Equivalent Number Sentences **5.2** Using Patterns to Divide **5.3** Dividing 3-Digit by 1-Digit Numbers **5.4** Dividing Using Zeroes **5.5** Understanding Remainders **5.6** Dividing with Remainders **5.8** Checking for Reasonableness in Division Problems **7.1** Using Models to Add Fractions **7.2** Using Models to Subtract Fractions **7.3** Adding and Subtracting Fractions with Like Denominators **7.4** Adding Mixed Numbers with Like Denominators **10.1** Using Patterns to Show Relationships **10.2** Making a Table to Show Patterns **10.3** Working Backwards to Solve Problems	**6.6** Drawing a Diagram to Solve an Equation **6.7** Understanding Properties of Equality **6.8** Solving Addition and Subtraction Equations **6.9** Creating Number Sequences Using Whole Numbers, Fractions and Decimals

Measurement and Geometry

Year 3	Year 4	Year 5	Year 6
4.1 Using Different Tools to Measure **4.2** Estimating and Measuring with Centimetres **4.3** Estimating and Measuring with Centimetres and Metres **4.4** Estimating and Measuring with Metres and Kilometres **4.5** Estimating and Measuring with Millilitres and Litres **4.6** Estimating and Measuring with Grams and Kilograms **4.7** Understanding Perimeter **4.8** Identifying Different Shapes with the Same Perimeter	**10.1** Telling Time to the Minute **10.2** Relating Units of Time **10.3** Comparing Units of Time **10.4** Finding Elapsed Time **10.5** Working Backwards to Solve Time Problems **10.6** Understanding Temperature **11.1** Measuring with Formal Units of Length **11.2** Finding Perimeter **11.3** Identifying Different Shapes with Same Perimeter **11.4** Understanding Area	**8.1** Finding Perimeter **8.2** Identifying Different Shapes with the Same Perimeter **8.3** Finding Area of Rectangles and Squares **8.4** Exploring Perimeter and Area of Rectangles **8.5** Solving Problems with Perimeter and Area **8.6** Measuring Units of Capacity **8.7** Understanding Units of Mass **8.8** Measuring Volume **11.1** Finding Elapsed Time	**2.6** Finding Elapsed Time **9.1** Finding Perimeter **9.2** Converting Measurements **9.3** Identifying Decimals in the Metric System **9.4** Finding Area of Irregular Shapes **9.5** Finding Surface Area **9.6** Finding Volume of a Prism **9.7** Finding Volume and Capacity of Rectangular Prisms

Scope and Sequence

Australian Curriculum Reference	enVisionMATHS Scope and Sequence		
	Foundation	Year 1	Year 2
Measurement and Geometry			
Using units of measurement (cont.)	**7.4** Understanding Days of the Week **7.5** Yesterday, Today and Tomorrow **7.6** Identifying Numbers on a Clock **7.7** Telling Time on the Hour **7.8** Understanding Hot and Cold **7.9** Understanding the Seasons		**8.5** Understanding Area **8.6** Estimating and Comparing Capacity Using Litres **8.7** Measuring Mass **8.8** Estimating and Comparing Mass Using Kilograms **8.9** Understanding Attributes of Objects
Shape	**6.1** Recognising 2D Shapes **6.2** Describing Properties of Shapes **6.3** Making Pictures Using Shapes **6.4** Identifying 3D Objects	**6.1** Understanding Properties of 2D Shapes **6.2** Identifying 2D Shapes **6.3** Understanding Orientation of Shapes **6.4** Identifying 3D Objects **6.5** Sorting 3D Objects	**6.1** Identifying Shapes and Objects Using Reasoning **6.2** Describing Features of Polygons **6.3** Identifying Features of 3D Objects
Location and transformation	**2.1** Identifying Inside and Outside **2.2** Identifying Over, Under and On **2.3** Identifying Top, Middle and Bottom **2.4** Identifying In Front Of, Between and Behind **2.5** Identifying Near and Far **2.6** Identifying Left and Right **2.7** Describing Position and Movement	**7.6** Giving and Following Directions	**6.4** Moving Shapes: Flip, Slide, Turn **6.5** Understanding Half and Quarter Turns **6.6** Using Maps of Familiar Locations
Geometric reasoning			

enVisionMATHS Scope and Sequence

Measurement and Geometry

Year 3	Year 4	Year 5	Year 6
10.1 Telling Time to the Nearest Five Minutes **10.2** Telling Time to the Minute **10.3** Reading Timetables **10.4** Converting Units of Time **10.5** Understanding Elapsed Time Using a Calendar **10.6** Solving Multi-step Time Problems	**11.5** Estimating and Measuring Area **11.6** Estimating and Measuring with Millilitres and Litres **11.7** Estimating and Measuring with Grams and Kilograms **11.8** Introducing Volume **11.9** Enlarging and Reducing Measurements **11.10** Reading Scales	**11.2** Solving Problems Using Elapsed Time **11.3** Solving More Problems Using Elapsed Time **11.4** Reading 24-Hour Time **11.5** Reading Schedules	
6.3 Identifying Polygons **6.4** Making Generalisations About Polygons **6.5** Identifying 3D Objects **6.6** Identifying Faces on 3D Objects **6.7** Relating 2D Shapes and 3D Objects	**5.2** Relating 2D Shapes and 3D Objects **5.3** Describing and Classifying Objects **5.4** Acting Out to Reason About 3D Objects **5.5** Identifying 2D Shapes in Other Shapes	**6.5** Making and Testing Generalisations about Rectangles **6.6** Identifying 3D Objects **6.7** Understanding Polyhedrons **6.8** Relating 2D Shapes and 3D Objects **6.9** Relating 2D Shapes and 3D Objects Using Nets **6.10** Viewing Perspectives of 3D Objects **9.6** Understanding Pentominoes **9.7** Using Pentominoes to Solve Problems	**4.3** Using Properties of Shapes to Solve Problems **4.4** Constructing Simple Prisms and Pyramids **4.6** Identifying Properties of Different Quadrilaterals **4.7** Identifying Properties of Circles **10.1** Viewing Perspectives of 3D Objects **10.2** Using Objects to Solve a Simpler Problem
7.1 Giving and Following Directions **7.2** Using Ordered Pairs on a Grid **7.3** Identifying Lines of Symmetry **7.4** Creating and Using Tangrams	**6.1** Using Compass Directions **6.2** Using Compass Points to Describe Location **6.3** Understanding Scale Drawings **6.4** Drawing Shapes with Lines of Symmetry **6.5** Understanding Tessellating Shapes	**6.5** Making and Testing Generalisations about Rectangles **6.11** Enlarging and Reducing Shapes **9.1** Moving Shapes: Flip, Slide, Turn **9.2** Moving Congruent Shapes: Flip, Slide, Turn **9.3** Translating Shapes **9.4** Reflecting Shapes **9.5** Rotating Shapes **9.6** Understanding Pentominoes **9.7** Using Pentominoes to Solve Problems **9.8** Creating and Using Tessellations **9.9** Identifying Lines of Symmetry **9.10** Understanding Symmetry **9.11** Using Maps to Describe and Interpret Location	**4.3** Using Properties of Shapes to Solve Problems **10.1** Viewing Perspectives of 3D Objects **10.2** Using Objects to Solve a Simpler Problem **10.3** Investigating Translations, Reflections and Rotations **10.4** Locating and Plotting Coordinates **10.5** Introducing the Cartesian Plane
6.1 Understanding Lines and Line Segments **6.2** Introducing Angles	**5.1** Describing Angles	**6.1** Understanding Lines and Angles **6.2** Measuring Angles **6.3** Classifying Triangles **6.4** Classifying Quadrilaterals	**4.1** Measuring and Drawing Angles **4.2** Measuring and Predicting Angles **4.5** Classifying Triangles **4.6** Identifying Properties of Different Quadrilaterals

Scope and Sequence

Australian Curriculum Reference	enVisionMATHS Scope and Sequence		
	Foundation	Year 1	Year 2
Statistics and Probability			
Chance		**11.4** Identifying What Will, Won't or Might Happen **11.5** Identifying More Likely **11.6** Identifying Certain or Impossible	**10.6** Identifying Likely and Unlikely **10.7** Identifying Certain, Possible and Impossible **10.8** Understanding Probability
Data representation and interpretation	**11.1** Collecting Data **11.2** Understanding Data **11.3** Representing Data on a Picture Graph **11.4** Making a Graph	**11.1** Collecting Data **11.2** Making Graphs with Objects **11.3** Understanding Data	**10.1** Using Tally Marks **10.2** Making a Picture Graph to Show Data **10.3** Making a Bar Graph to Show Data **10.4** Graphing to Show Data **10.5** Interpreting Graphs **10.8** Understanding Probability

enVisionMATHS Scope and Sequence

Year 3	Year 4	Year 5	Year 6
Statistics and Probability			
12.7 Predicting and Comparing Outcomes **12.8** Comparing Outcomes with Predictions **12.9** Finding Combinations	**12.7** Predicting and Comparing Outcomes **12.8** Identifying Related Events **12.9** Identifying Independent Events	**12.8** Understanding Averages **12.9** Using Tree Diagrams to Present Outcomes **12.10** Making an Organised List to Record Outcomes **12.11** Exploring Probability	**12.1** Conducting Chance Experiments **12.2** Counting Methods **12.3** Using Statistics to Make Predictions **12.4** Making a List to Record Outcomes **12.5** Comparing Outcomes with Predictions **12.6** Using Fractions, Decimals and Percentages to Describe Probability
12.1 Organising Data **12.2** Posing Questions to Collect Data **12.3** Reading Picture Graphs and Bar Graphs **12.4** Making Bar Graphs **12.5** Using Tables to Construct Bar Graphs **12.6** Using Tables and Graphs to Draw Conclusions	**12.1** Using Surveys **12.2** Organising Data **12.3** Reading Pie Graphs **12.4** Making a Graph **12.5** Understanding Venn Diagrams **12.6** Using Reasoning to Draw Conclusions	**12.1** Displaying Data from Surveys **12.2** Selecting Samples for Surveys **12.3** Interpreting Graphs **12.4** Making and Interpreting Bar and Picture Graphs **12.5** Using Line Graphs **12.6** Interpreting Line Graphs **12.7** Organising Data Using a Dot Plot **12.10** Making an Organised List to Record Outcomes	**11.1** Comparing Graphs **11.2** Presenting Multiple Sets of Data on One Graph **11.3** Labelling Pie Graphs **11.4** Representing and Interpreting Data on a Line Graph **11.5** Making a Graph to Represent Data **11.6** Understanding Stem and Leaf Plots **11.7** Using Statistics to Draw Conclusions **11.8** Interpreting Secondary Data **12.2** Counting Methods

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