numicon

Introducing Numicon 5

Building a secure future in mathematics for every child

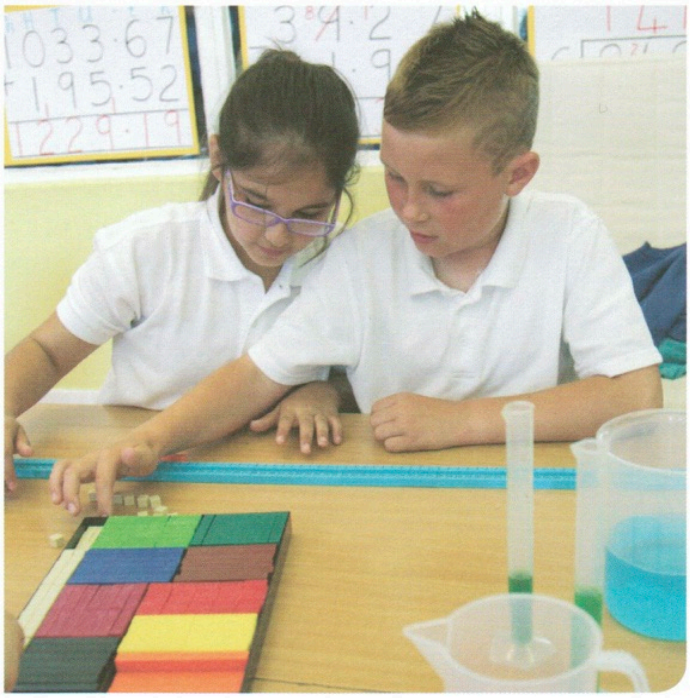
OXFORD

Building a secure future in mathematics for every child

Numicon is a multi-sensory approach to teaching mathematics based on a proven pedagogy that raises achievement across all ability levels and sustains it over time.

It is supported by tailored professional development that will support and inspire you to deliver the highest quality teaching.

With resources from early childhood to Year 5/6, plus support for intervention and inclusion, Numicon provides all you need to teach and enrich mathematics in your school.



Numicon fits well with the New Zealand Curriculum

Our teaching and learning resources:

- Develop fluency by using a visual, practical base to develop conceptual understanding and fluent recall.
- Help children to reason mathematically through the use of concrete objects and spoken language to explain and justify.
- Develop children into confident problem-solvers.
- Help you deliver the requirements of the new Programme of Study for each year group, and confidently assess children's progress.
- Allow you to differentiate for every child in your class through the same Activity Group, with 'low threshold, high ceiling' activities.

Numicon 5

2015

With resources for **Number, Pattern and Calculating**, and **Geometry, Measurement and Statistics** you can teach right across the new Year 5 maths curriculum, and face its increased demands and raised expectations with confidence.

Covering key topics such as fractions, percentages, factors, multiples and negative numbers, the **Activity Groups** have careful progression and adaptable, easy-to-follow steps built in. For assessment, the **Explorer Progress Books** allow you to gather evidence of each child's understanding, and the regular **Milestones** enable you to track their progress throughout the year. The **Explore More Copymasters** provide fun activities for children to practise and discuss maths at home.

All you need for Numicon 5:

- **Numicon Number, Pattern and Calculating 5 Easy Buy Pack**

  Contains:
  - Number, Pattern and Calculating 5 Teaching Resource Handbook and Implementation Guide.
  - Number, Pattern and Calculating 5 Explorer Progress Books A, B and C (30 copies of each).
  - Number, Pattern and Calculating 5 Explore More Copymasters

- **Numicon Geometry, Measurement and Statistics 5 Easy Buy Pack**

  Contains:
  - Geometry, Measurement and Statistics 5 Teaching Resource Handbook (includes Explore More Copymasters) and Implementation Guide.
  - Geometry, Measurement and Statistics 5 Explorer Progress Book (Pack of 30).

- **Starter Apparatus Pack C**

  Contains a new selection of apparatus ready for every element of the Year 5 curriculum.

Early Childhood to NZ Curriculum Level 4

Numicon overview chart

- First Steps with Numicon in the Nursery
- First Steps with Numicon at Home
- Numicon at the Seaside
- Firm Foundations and *New* Firm Foundations
- Breaking Barriers
- Big Ideas – intervention for older students
- Teaching Resources for Numicon 1- 6:

Teaching Resource Handbook
Implementation Guide
Explore More – extra activities or for home work
Explorer Progress – assessment

- Pupil Books – Numicon 4 - 6
- Investigations with Numicon

Numicon 5

Easy Buy Packs for NPC and GMS
Which include:
Teaching Packs for NPC
Teaching Packs for GMS
Explorer Progress Books:
NPC: 3 per student
GMS: 1 book per student
Explore More -Photocopy Masters

Apparatus Packs

Apparatus Packs – Starter Class and Starter 1:1

- Apparatus Pack a – Supports Numicon 1 and 2
- Apparatus Pack b – Supports Numicon 3 and 4
- Apparatus Pack c – Supports Numicon 5 and 6
- Breaking Barriers – Breaking Barriers Teaching Pack
- Firm Foundations Apparatus Packs – Firm Foundations
- Big Ideas Apparatus Pack – Big Ideas

Number, Pattern and Calculating 5 Teaching Resource Handbook

Sample activity group

Key mathematical ideas Fractions, Equivalence, Ordering, Mathematical thinking and reasoning

Numbers and the Number System

Comparing and ordering fractions

6

Educational context

This activity group develops work from Numbers and the Number System 2 and from the *Number, Pattern and Calculating 4 Teaching Resource Handbook*. Essentially, the activities are about using fractions to describe proportions, recognizing that a whole range of equivalent fractions can be used to describe the same proportion, and that proportions expressed as fractions can be ordered. Children are thus using fractions in these activities to develop their communicating about proportions, both within specific contexts and more generally. Later in Calculating 10, children will explore similar activities to help them make connections between proportion and ratio.

At the heart of this work, children are developing ways of recognizing and producing equivalent fractions. They then use this ability to compare fractions (or proportions) and order them in terms of size (magnitude).

These ideas are both important and challenging so children will need plenty of time, discussion and illustration to develop their communicating about fractions and proportions in these ways.

Learning opportunities

- To compare and order fractions whose denominators are all multiples of the same number.
- To use < and > signs to record the ordering of fractions.
- To simplify fractions to their lowest forms by finding common factors.
- To use equivalent fractions in context to scale up or down.

Words and terms for use in conversation

part-whole relationships, comparing, equivalent fractions, denominator, numerator, proportion, 'in every', unit fraction, proper fraction, improper fraction, mixed fraction, factors, common factor, divisible by, multiple, times, divide, equivalence, scale up, reduce, simplest forms, common denominator, proper fraction, improper fraction, greater than, less than

Assessment opportunities

Look and listen for children who:

- Use the words and terms for use in conversation effectively.
- Explain comparisons between fractions whose denominators are multiples of the same number and notice the effect of odd and even numerators.
- Use knowledge of multiples to convert fractions into equivalent fractions and illustrate this with structured apparatus.
- Compare fractions and order them using < > symbols.
- Make connections between scaling up and multiplying with the inverse of scaling down and dividing.
- Use knowledge of multiples and factors to simplify fractions to their lowest forms.

Explorer Progress Book 5b, pp. 4–5

After completing work on this activity group, give small focus groups of children their Explorer Progress Books and ask them to work through the challenges on the pages. As children complete the pages, assess what progress they are making with the central ideas from the activity group. Refer to the assessment opportunities for assistance.

Explore More Copymaster 13: Who Gets More?

After completing work on Activity 3, give children Explore More Copymaster 13: Who Gets More? to take home.

Clear assessment opportunities for every activity group.

Explorer Progress Book pages help you assess children's understanding of the central ideas from the activity group.

Explore More Copymasters give children a further opportunity to practise at home what they have been learning in class.

Topics are introduced through real-life scenarios. In this activity group, children learn about fractions.

Activities are focused on the children doing maths. Through the use of concrete objects, children's mathematics lessons are active.

Focus activities

6

Activity 1: Comparing and ordering proper fractions whose denominators are multiples of the same number

Have ready: Numicon Shapes, Numicon Coloured Counters, number rods, interlocking cubes

Step 1

Remind children about the lemonade activity from Numbers and the Number System 2, Activity 6. Ask them if they made two batches of lemonade, one with 2 cups of lemon juice in every 5 cups and the other with 3 cups of lemon juice in every 5 cups, which lemonade would taste stronger. Look and listen for children who can reason that having more lemon juice in the lemonade would make a stronger lemony taste. Help children to compare the different recipes with fractions and agree that we could write that one recipe has $\frac{2}{5}$ of lemon juice and the other has $\frac{3}{5}$.

Step 2

…mpare these fractions and …o make connections between …of the drink. As they work, …hese relationships on a number …

…st lemonade they need to …st on the number line to pure …derstand that 5 cups of lemon …drink that is purely lemon juice …r line as $\frac{1}{2}$ or 1 whole. Agree that …than $\frac{2}{5}$ so the recipe made with …5 cups would be stronger than …y 5 cups.

…4 cups of lemon juice in every 5 …s of lemon juice in every 10 cups …nade whether they could write …elp children to recognize that …resent the amount of lemonade …out these recipes and fractions. …ho can explain that these …

Step 4

Tell children to use, draw or write anything that might help them to compare these fractions. Look and listen for children trying out their own ideas, before asking them if finding equivalent fractions or using apparatus and number lines might be useful.

Step 5

Encourage children to explore how they could represent $\frac{2}{5}$ and $\frac{3}{5}$ on number lines or with apparatus. Look and listen for children who draw number lines which are the same length, dividing one line into fifths and the other into tenths (see Fig. 2).

Step 6

Show children how a double number line (see Fig. 3) with fifths at the top and tenths at the bottom can be useful when comparing these fractions and agree that we can see that $\frac{2}{5}$ is equivalent to $\frac{4}{10}$ and that this is closer to 1 than $\frac{3}{5}$.

Step 7

Help children also to use Shapes and Counters or rods to illustrate that $\frac{2}{5}$ is equivalent to $\frac{4}{10}$, e.g. Fig.4.

Look and listen for children who can now explain that if a recipe has $\frac{2}{5}$ or $\frac{4}{10}$ of lemon juice the one with $\frac{4}{10}$ or 8 cups in every 10 cups will have a stronger taste of lemon.

Step 8

Repeat the activity with other pairs of fractions whose denominators are multiples of the same number, e.g. $\frac{2}{3}$ and $\frac{5}{6}$. Look and listen for children who realize that they can compare the fractions as the denominators are multiples of the same number.

Step 9

Allow plenty of time for children to explore these ideas with pairs of fractions with common denominators. Include examples like $\frac{2}{3}$ and $\frac{1}{3}$ or $\frac{2}{3}$ and $\frac{5}{6}$ and encourage children to explain that they can sometimes compare fractions with common denominators in two ways, e.g. for $\frac{2}{3}$ and $\frac{5}{6}$ we can compare these as sixths ($\frac{4}{6}$ and $\frac{5}{6}$) and twelfths ($\frac{8}{12}$ and $\frac{10}{12}$) but this would not be the case for $\frac{2}{3}$ and $\frac{3}{5}$. Help children explain …erence to odd and even numerators.

6

Activity 2: Comparing and ordering proper fractions in a different context

Have ready: Numicon Shapes, Numicon Coloured Counters, number rods

Step 1

Explain to children that during a music lesson with percussion instruments, a group of children have been composing some rhythms. One child plays their instrument for the first 2 beats out of every 10, another plays the first 3 beats out of every 4 and a third plays the first 4 beats out of every 5. The children all count at the same speed and start at the so…

Step 2

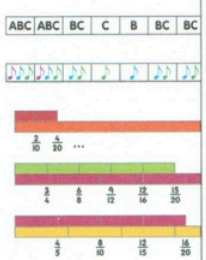
Practise counting and clapping the beats that e… chosen to play and then ask children if they ca… to illustrate these on paper to see which childre… their instruments at the same time. Explore chil… and help them to draw number lines to show t… using letters to represent the different children, … different coloured music notes or Counters, e.g…

Step 3

Ask children which instrument is played the m… look and listen for children who can reason th… who plays their instrument 4 beats in every 5 … often. Next ask children if they can write the nu… played by each child as a fraction of beats eac… Look and listen for children who can write the … and $\frac{4}{5}$.

Step 4

Ask children to talk about which of these fracti… largest or smallest and how this relates to the … beats played in the composition. Look and liste… who can remember that a good way to compa… is to convert them into equivalent fractions with … denominator and to illustrate these on a numb…



Step 5

Ask children to look closely at the fractions $\frac{2}{5}$, $\frac{3}{4}$ and $\frac{4}{5}$ and to talk about how they can convert these fractions into equivalent fractions with a common denominator. Give children the chance to explore these fractions with rods or Shapes and to write equivalent fraction families, e.g. Fig. 7. Look and listen for children explaining for themselves that all these fractions can be written as a fraction of 20, because 20 is a common multiple of 10, 4 and 5.

Step 6

6

Practice and discussion

Step 5

Agree that the recipe made with $\frac{2}{24}$ of lemon juice can be reduced to $\frac{1}{12}$ of lemon juice by dividing the numerator and denominator by 9 and in the same way $\frac{20}{36}$ of water can be reduced to $\frac{5}{9}$ of water by dividing by 9. These reduced recipes will have the same lemon strength. Help children to realize that the fractions of lemon juice and water in this recipe can be written in many different ways but $\frac{1}{12}$ of lemon juice and $\frac{5}{9}$ of water are the fractions that represent this recipe in its simplest form. This means it cannot be reduced any further.

Step 6

Repeat this discussion with a new recipe using $\frac{14}{20}$ of lemon juice and $\frac{28}{36}$ of water.

Activity 5: Simplifying fractions to their lowest terms

Have ready: number rods

Step 1

Talk to children about fractions out of context, e.g. $\frac{12}{20}$ and ask them to write some equivalent fractions. Look and listen for children who can write a list of equivalent fractions for $\frac{12}{20}$ by scaling up e.g. $\frac{24}{40}$, $\frac{36}{60}$ and also those who can scale down by halving, e.g. $\frac{6}{10}$ and $\frac{3}{5}$, or by looking for a common factor.

Step 2

Help children to look for a common factor in 12 and 20. Use rods to build and compare fraction walls for 12 and 20, e.g. Fig. 11.

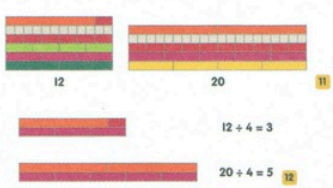
From looking at the fraction walls agree that 1, 2 and 4 are common factors of 12 and 20. Help children to work with both 2 and 4 to simplify the fraction and to realize that if they choose the largest common factor 4, they will find the simplest form of the fraction.

Step 3

Help children to divide $\frac{12}{20}$ by 4 to get $\frac{3}{5}$ and to illustrate this with rods, e.g. Fig. 12.

Step 4

Repeat with fractions like $\frac{6}{10}$, $\frac{8}{20}$, $\frac{9}{27}$, $\frac{8}{12}$, $\frac{10}{12}$, $\frac{10}{30}$, $\frac{10}{15}$. Work with children to use rods to find the largest common factors and to reduce these fractions to their simplest forms.



Whole-class

- Discuss with children how and when the mathematics they have been learning could help them in solving problems.
- Ask children to write scores using fraction notation and compare them, e.g. which is the better score, $\frac{8}{10}$ or $\frac{12}{20}$? Talk about sports results, e.g. which team is doing better, Team A or Team B, if Team A has won $\frac{3}{10}$ games and Team B has won $\frac{7}{10}$ games?
- Ask children to use the > and < symbols to show the relationships between pairs of fractions with denominators that are multiples of the same number (e.g. $\frac{2}{3}$ and $\frac{4}{11}$).
- Select a set of fraction cards where the denominators are multiples of the same number and play higher than/lower than games.
- Ask children to find equivalent fractions from a list where the denominators are all multiples of the same number.
- Give fraction statements with missing numerators or denominators for children to complete, e.g. $\frac{2}{3} > \frac{\square}{24}$ or $\frac{3}{\square} > \frac{4}{15}$.
- Remind children about multiples and factors. Ask them to count in multiples and to find all the factors of any given number.
- Show children two numbers and talk with them about common factors, e.g. 24 and 32.
- Continue a list or family of equivalent fractions following a pattern, e.g. $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$ and simplify fractions, e.g. $\frac{30}{60}$.

Independent

Paired work for Activities 1 and 2

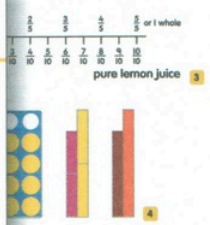
Have ready: Numicon 0–100 Numeral cards

Children take turns to make two proper fractions using 2–24 Numeral Cards, making sure the denominators are multiples of the same number, e.g. $\frac{3}{4}$ and $\frac{5}{12}$. Compare these using a double number line.

Individual work for Activities 1 and 2

Have ready: Pairs of fractions with denominators that are multiples of the same number, e.g. $\frac{2}{3}$ and $\frac{5}{6}$

Ask children to select a pair of fractions and compare these fractions on a double number line.



'Look and listen for…' points help you to assess how children are responding to activities.

Concrete materials help illustrate children's thinking and reasoning.

Geometry, Measurement and Statistics 5 Teaching Resource Handbook

Sample activity group

Key mathematical ideas provide a summary of important concepts children will meet in the activity group.

Key mathematical ideas Volume and capacity, 2D and 3D, Equivalence, Standard units **Measurement**

Estimating volume and capacity 5

Educational context

In this activity group children build on their work on capacity and volume from the *Geometry, Measurement and Statistics 4 Teaching Resource Handbook*. Using their understanding of liquid volumes, they explore solid volumes through building cubes and cuboids and reasoning about their dimensions. Working practically with number rods, interlocking cubes and isometric paper, children investigate and calculate the volume and capacity of various cuboids. They build models with specific volumes, in cubic centimetres, relating this to their understanding of multiplication and building on their learning about square and cube numbers in the *Number, Pattern and Calculating 5 Teaching Resource Handbook*, Pattern and Algebra 4. They also practise drawing 2D representations of 3D cubes and cuboids on isometric paper.

In Activity 4, children explore displacement (as discovered by Archimedes) and develop an understanding of the equivalence between cubic centimetres and millilitres. They convert between millilitres or litres and cubic centimetres, preparing them for meeting cubic millimetres, metres and kilometres in the *Geometry, Measurement and Statistics 6 Teaching Resource Handbook*. Finally, they work together to design a miniature aquarium according to given specifications.

Learning opportunities

- To calculate the volume of cuboids in cubic centimetres.
- To estimate the volume of solids in cubic centimetres.
- To recognize and draw 2D representations of 3D cubes and cuboids.
- To consolidate understanding of square and cube numbers.

Words and terms for use in conversation

size, space, volume, capacity, length measurements, length, width, height, depth, dimensions, two/three dimensional, 2D, 3D, cuboid, cube, rectangle, oblong, square, displace, product, estimate, orientation, square number, cube number, cubic centimetre

Assessment opportunities

Look and listen for children who:

- Use the words and terms for use in conversation effectively.
- Convert between cubic centimetres and millilitres or litres.
- Estimate the volume of a solid object in cubic centimetres.
- Estimate the volume of liquids in millilitres.
- Calculate the volume of a cuboid given the length, width and height.
- Describe what a cube number is.
- Calculate and recognize cube numbers (up to 6^3).
- Recognize and create 2D representations of 3D cubes and cuboids.

Explorer Progress Book 5, pp. 12–13

After completing work on this activity group, give small focus groups of children their Explorer Progress Books and ask them to work through the challenges on the pages. As children complete the pages, assess what kind of progress they are making with the central ideas from the activity group. Refer to the assessment opportunities for assistance.

Explore More Copymaster 8: Volume

After completing work on Activity 2, give children Explore More Copymaster 8: Volume to take home.

A clear outline of the content covered in the activity group and how it connects with other activity groups.

Important words and terms are highlighted for use in mathematical conversation.

The learning opportunities come from real classroom experiences and are designed to help children develop their understanding of the key ideas in each activity group.

A clear list of the apparatus used to support learning is provided at the start of every focus activity.

Careful progression is built into every activity group, and across the whole teaching programme, helping children to become fluent through understanding.

Opportunities for whole-class, paired and individual practice activities are included in every activity group to give children the opportunity to build on their knowledge, deepen their thinking and develop their mathematical conversations with others.

Focus activities

Activity 1: Finding the volume of a cuboid

Have ready: Numicon 1–100 cm Number Rod Track, number rods, model cubes and cuboids, rulers

Step 1

Show children some model cuboids (but without naming them as such). Ask them to make the same type of shape using one size of number rod (e.g. Fig. 1). Give them plenty of opportunity to work out how to do this. Talk with them about how they could add or remove rods to give either square or oblong faces (e.g. Fig. 2).

Discuss with children the rod shapes and model cuboids: what is the same and what is different? Look and listen for children comparing colours, materials, lengths, widths, heights and the shape of faces. Agree that they are all cuboids, since they have only rectangular faces.

Step 2

Ask children how they could work out how many rods make up their cuboid (other than by counting). Encourage them to consider the number of rods in each layer and the number of layers. Agree that multiplying these numbers gives the number of rods, e.g. a cuboid with 2 layers of 3 rods has $2 \times 3 = 6$ rods in it.

Step 3

Ask children to describe or name the different 'dimensions' – the different length measurements – they can find on their

Step 4

Show children a 1-rod. Agree it is a cube; encourage children to measure its dimensions (1 cm × 1 cm × 1 cm) to help them explain why. Agree that a 1-rod can also be called a '1 cm cube'. Ask children whether they can work out how many '1 cm cubes' could be used to make their number rod cuboid. Some children may explore this with 1-rods or by placing the rods from their cuboid in the Number Rod Track; others may be confident calculating, e.g. each 10-rod is the same as ten 1-rods, so six 10-rods is the same as $6 \times 10 = 60$ '1 cm cubes'.

Step 5

Encourage plenty of discussion and exploration of the dimensions of the cuboid and their relationship to '1 cm cubes'. Help children notice the equivalence between the product of the dimensions (e.g. $10 \times 3 \times 2 = 60$) and the number of 1 cm cubes in a cuboid.

Explain to children that 'cubic centimetres' are units used to describe the volume of solids; recall that they have measured volumes of liquid in millilitres and litres. Show children the notation 'cm³' and agree that the 1-rod has a volume of 1 cm³. Discuss with them the connection to 'square centimetres' and notation 'cm²' from their work on area. Encourage them to record the volume of their cuboid as, e.g. 10 cm × 3 cm × 2 cm = 60 cm³.

Step 6

Ask children to create other number rod cuboids, recording their dimensions and working out their volumes in cubic centimetres.

Step 7

Give the dimensions of a cuboid, in centimetres, e.g. 4 cm × 3 cm × 2 cm. Ask children to make it in as many different ways as they can, using one type of number rod for each cuboid, and to find the volume each time. Discuss similarities and differences, supporting children to turn their cuboids so they are in the same orientation (e.g. Fig. 3), for easier comparison. Look and listen for children noticing that

Practice and discussion

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Whole-class

- Discuss with children how and when the mathe have been learning could help them in solving
- Use interlocking cubes to make cuboids (includ and other shapes for children to draw on isom and say the volume.
- Show cuboids (including cubes) drawn on isor for children to build and/or work out the length height and volume.
- Ask children to use 1-rods or interlocking cubes cuboids with given volumes.
- Give the volume and one dimension (length, w of cuboids for children to work out what the oth dimensions could be.
- Prepare in advance by measuring the volume of small objects in cubic centimetres (as in Activ the objects for children to estimate their volume compare the measured volumes.
- Give volumes for children to convert between c centimetres and millilitres or litres.
- Give numbers to 12 at random, for children to s corresponding square numbers.
- Recite sequences of square and cube numbers with children.
- Invite children to discuss and estimate some re volumes and capacities, e.g. the volume of juic typical soft drinks can (330 ml), a typical car en (2 ℓ), a typical capacity for a garden water butt volume of water in an Olympic-size swimming 2 500 000 ℓ).

Independent

Paired work for Activity 1

Have ready: number rods, Numeral Cards 1–10 (photocopy master 15)

Children take turns to select a numeral card for th rod and another for the number of rods. They use to build as many different cuboids as they can, re their dimensions.

Paired work for Activity 1

Have ready: dice, number rods

Children roll a dice three times to generate the di centimetres, of a cuboid. Using rods to help them out the cuboid's volume, then which other sets of would give a cuboid with the same volume.

5

Step 5

Encourage children to explore possible approaches, e.g. building the 'capacity' cuboid with number rods, using knowledge of factor pairs for 60 (e.g. Fig. 11), before adding walls and base and removing the original cuboid (e.g. Fig. 12). Encourage them to find as many different designs as possible, recognizing which do not meet the specification requirements, e.g. which are less than either 4 cm wide or 10 cm long. Ask them to record the dimensions and work out the volume of plastic needed to make each design (e.g. Fig. 12).

Step 6

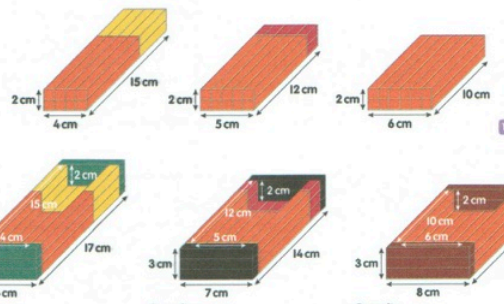
Discuss children's designs, including which needs the least plastic and would therefore be most cost effective.

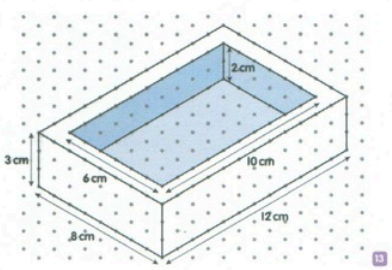
Step 7

Encourage children to work together to draw their designs accurately and label the dimensions (e.g. Fig. 13).

Step 8

Some children may like to design a lid for the aquarium, considering, e.g. whether or not it should overlap the walls.





Using and applying is supported through use of real-life contexts.

Number, Pattern and Calculating 5
Explorer Progress Book 5c
Sample pages

Date ____/____/____

Stick Houses

Emma is creating stick houses.

Can you find a general rule for the number of sticks that she needs to create each pattern in the sequence?

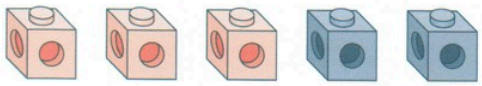
Can you explain how you worked this out?

Teacher notes

Have ready: interlocking cubes

Date ____/____/____

Joining Cubes



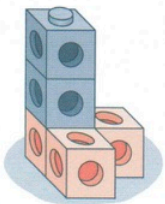
Join five interlocking cubes like these ones together on your table.

The three cubes of one colour must all touch the table.

The two cubes of another colour should not touch the table.

One design is shown for you.

How many different designs are there?



Can you explain why you think you have found them all?

Teacher notes

Explorer Progress Books provide a record of achievement and offer an invaluable chance to see children's thinking, monitor their progress and assess their understanding.

Each activity has space for you to offer support and encouragement to children.

Children have the freedom to record their answers in their own way, allowing you to see their thinking.

Open activities give you the opportunity to see how well children can use and apply their maths learning in new contexts.

Number, Pattern and Calculating 5 Explore More Copymasters

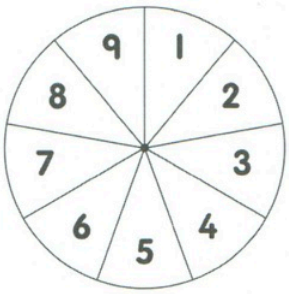
Sample pages

Activities for home offer further opportunities for children to explore maths in an engaging way.

Name ..... Date ...../...../.....

Charity Fundraising

		Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Units
Tiger Charity	£							
Cat Charity	£							
Donkey Charity	£							
Polar Bear Charity	£							
Panda Charity	£							
Eagle Charity	£							



Lowest amount							Highest amount

Number, Pattern and Calculating 5
Numbers and the Number System 1, Working with numbers up to a million

20 Numicon – Number, Pattern and Calculating 5

Numbers and the Number System 1, Working with numbers up to a million

Charity Fundraising

How this will help your child

- This activity will allow your child to practise making, reading and saying numbers in the millions.
- It will help them to understand how the value of a digit is shown by its position in a number.
- It will also help them to compare and order big numbers.

Words and phrases to use

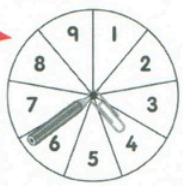
number names (one to nine million), place value, worth, greater, smaller, digit, units, tens, hundreds, ten thousands, hundred thousands, millions, zero

You will need

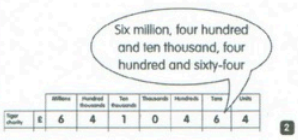
- A paper clip
- 2 pencils

During the activity, look at what your child can do

- Make 7-digit numbers using their understanding of place value.
- Say the correct number name to the correct place value.



1



		Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Units
Tiger Charity	£	6	4	1	0	4	6	4

2

What to do

- Ask your child to choose a charity from the table on the Charity Fundraising sheet, e.g. Tiger Charity.
- Use the paper clip and a pencil to make the spinner. 1
- Ask your child to spin the paper clip to choose a digit and then to pick a column in the table to write the digit in, e.g. the hundreds column. Write in pencil so the game can be played again.
- Take turns to spin the spinner five more times until they have written a digit in all of the columns but one for their chosen charity. Ask them to write a zero in the final column. Explain that the number is the amount of money that the charity raised in a year.
- Ask your child to read the amount raised, e.g. 'Tiger Charity has raised six million, four hundred and ten thousand, four hundred and sixty-four pounds'. 2
- Repeat for each charity until the table has been completed and your child has read all the amounts.
- Now ask them to order the amounts by writing the names of the charities, from the lowest to the highest amount raised, in the chart on the bottom of the sheet. 3

Next steps ...

- Rub out the markings and play the game again. Aim to get the highest amount of money for each charity by thinking about which columns to place the numbers in.
- Play the game again, spinning five numbers and writing two zeroes.
- Look for 7-digit numbers with your child, e.g. in newspapers or when out and about, ask them to read the numbers and talk about what they mean.

Lowest amount	Tiger Charity	Eagle Charity	Donkey Charity	Polar Bear Charity	Panda Charity	Cat Charity	Highest amount

3

Practical, real-life contexts help children think about how maths can be used and applied.

Short, simple instructions guide parents through the activity.

Suggestions on how to extend the activity are included on every homework sheet.

Simple illustrations help to explain the purpose of activities.

Your next steps…

Find out how Numicon can make a difference in your school and discover Numicon's potential, **arrange an appointment, or Professional Development with us:**

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