vector maths & science catalogue 2025

(Ma) (Sc)

sharp minds, bright futures

50 years of mmeducational group

vecto

Welcome!

At Vector Maths & Science, we value the ongoing pursuit of knowledge, skills and abilities. Hence, we have established a clear goal – to sharpen students' minds and shape their path towards educational excellence.

To achieve this, we offer more than theories and procedures.

- > We build a strong understanding of the fundamentals in Maths and Science.
- > We equip students with practical skills necessary, not only for a successful academic development, but also in everyday life.
- > We develop materials that correspond to the needs of the 21st century, preparing our students to excel in the modern world.

The company's mission is to provide quality materials with an emphasis on creativity as well as analysis. Vector materials encourage users to dive deep into the subject matter and guide them in the process of discovering and understanding facts and phenomena.

The slogan 'Sharp Minds, Bright Futures' emphasises the objective of the company, which is to challenge the minds of young people and encourage them to achieve what they believe is unachievable.

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- (iii) @vectormathsscience



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Key to icons





Teacher's Digital

Resources



Teacher's Book







What do our Maths books offer?

They promote the development of thinking skills that are linked to the mental strategies used when we process information, make decisions, solve problems, etc. And we achieve this, using innovative, creative and practical materials!



Our Science courses offer a chance to experience an exciting adventure into the mysteries of nature. The students need only to be persistent, open-minded and to use their critical thinking. It is our responsibility to equip them with the resources, materials and skills necessary to succeed.





CEFR	A1		A2		B1		B2		C1	
LEVELS	A1.1	A1.2	A2.1	A2.2	B1.1	B1.2	B2.1	B2.2	C1.1	C1.2
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Designed for very young learners, Play with Maths, which consists of two books, is sure to thrill children. The purpose of the series is to bring children into contact with Mathematics in a fun and entertaining way, through an abundance of activities.

Children are familiarised with basic mathematical concepts such as numbers, patterns, tables, etc. that help them enter the world of mathematics in their school life more easily.



COURSE FEATURES

For Students

- illustrated cover pages that trigger the interest of young learners
- examples in every unit that help learners understand the concept taught
- various activities that activate the mathematical thinking of young learners in a fun way
- extra activities and games to recycle and consolidate learning
- visual problem-solving strategies that help learners understand the relationship between numbers and quantities
- colour-in pages

For Teachers

- main learning objectives presented at the beginning of each unit
- suggested vocabulary that can be used throughout the unit
- list of the corresponding flashcards to every activity
- a section with students' common difficulties also presented in the example pages
- extra material (activities, games, flashcards, etc.) that helps the teacher conduct the lesson
- a pictorial tool (Bar Model Method) used to organise and visualise relationships between known and unknown quantities in word problems
- keys to all activities
- a brief list of everything learners were taught at the end of each unit
- a glossary to support the use of mathematical terms



Student's
BookStudent's
BookStudent's
BookStudent's
Digital
ResourcesTeacher's
Digital
Resources



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key to extra activities provided flashcards **Extra Activities** Play with Maths A, Teacher's **Digital Resources** 00 Activity 2 Colour in the balloons. Accept all possible answers. Suggested answers: Three balloons are green and the rest are orange. next Two balloons are blue and the rest are yellow. 00 65 0 One balloon is brown and the rest are purple. pattern

attractive illustrations







Maths for kids

Maths for kids is a two year course that introduces very young learners to the world of mathematics. Through this course, students learn about numbers, shapes, measurements, position, addition, subtraction, and other mathematical concepts.

The series places emphasis both on the presentation of each topic in a simple and comprehensible way, and also on the activities that ensure that each new mathematical concept is conquered. Through questions, students realise the existence of mathematics in their everyday life and therefore their learning process becomes more meaningful. Through practice, students become confident and they build a strong base for mathematical development.

2 LEVELS up to A1+ 🔍 🏶

COURSE FEATURES

For Students

- illustrated cover pages and vivid pictures that trigger the interest of young learners
- various activities that activate the thinking skills of young learners in a fun way
- extra activities and games to revise and consolidate learning
- self-evaluation sections of everything learners were taught
- flashcards that help students understand the mathematical meaning
- resource sheets for extra practice on the mathematical concept taught
- revision pages to refresh what students have learnt in each unit
- colour-in pages

For Teachers

- a table with the corresponding learning objectives, materials, flashcards and resources that are needed throughout the level
- step-by-step instructions for the teacher to follow
- revision on the vocabulary taught in each unit with the help of flashcards
- crafts sections related to the subject taught
- additional materials (posters, resource pictures, etc.) for more practice in class
- 'More Practice' sections with photocopiable/downloadable materials with extra activities on the topics taught
- keys to all activities







step-by-step lesson plans



Pre-Primary



Revision 3 **Revision 3** kids A. Teacher's Bool on Plar Activity 4 • Read the words in the boxes aloud to Ss. • Explain to Ss that they will look at the pictures and write a-d in the boxes next to the correct word. • Give Ss some time to do the activity. What you will need: Materials: coloured pencils, pencils Resources: Colour in Unit 3 Flashcards: circle, count 0-5, heavier, heavy, less, light, lighter, more, number five, number two, number zero, rectangle, sorting, square, triangle vity 2 Tick (v) the group that has 1 r Revision TOTT Teler 3 P o ∆b square ⊂ rectangle d ⊂ d crete a risangle b Draw lines to sort 🕹 🥃 👅 🗊 🐚 🖄 🦉 Revise the previous lessons. Have Ss open their book at page 42. Give Ss some time to look at the picture. Show Ss all the flashcards of the unit one by one, in order to revise all the words taught. Ask Ss questions such as the ones below to I can • Now, read the sentences of the 'I can' section one by one and discuss them with Ss to understand the level of knowledge and skills they have achieved. Write a - d to matc Ask Sa questions such as the ones below to help them do some brief revision: > Can you couru up to 57 > Which number is after 37 > Which number is before 27 > Which at shape does the frame on the wall have? > Which is heavier, an elephant or a mouse? > I have to fiss. One list with hard toys and one list with soft toys. Where should I put a teddy bear and where should I put a toy car? Circle triangle Colour in activity • Ask Ss to turn to page 95. • Provide each S with coloured pencils, and ask them to colour in the picture. • Explain to Ss that they will colour in the picture with only the colours they see next to cach expan. * & # & < # * * / 0 # & \ 0 count sets of up to 5 objects say which has more and which has less say the number that is 1 more than another recognise a square, circle, rectangle and tric recognise which is heavier or lighter Maths : to each shape. Give Ss some time to do the activity. 👴 🗮 🥠 🐼 In the next lesson, Ss will be working with crafts. They are asked to prepare a construction. Please go to the 'Hands for Crafts' section of this unit a page 80. Read the instructions and prepare the materials that you will need in class. 3 42 Activity 1 • Provide each S with a pencil. • Explain to Sa that they will count the animals and write the numbers next to the appropriate picture. • When Ss count the animals, it's a good idea to graps the opportunity to revise sorting by posing questions such as: • How do I sort animals in this activity? • How many types of animals are there? • Give Ss some time to do the activity. Activity 2 • Explain to Ss that they should look at the pictures and tick the picture that has one tree more Activity 3 • Read the sentences in the boxes aloud to Ss. • Explain to Ss that they should look at the pictures with the sentences. • Give Ss some time to do the activity. Give Ss some time to do the activity. P 🌉 🥶 🖲 💭 🖉 P * & = & < = * * / • = & & < • I can wear I can eat 0 2 🗮 5 🥠 4 🕺 3 48 key to all colour-in activities activities

provided





Let's Start! Maths

Let's Start! Maths is a robust series, which uses effective learning and teaching methodologies in order to smoothly ease primary learners into the exciting world of maths. Aimed at the development of problem-solving skills in young learners, the series introduces a variety of word problems to challenge them. The main goal of the series is the improvement of students' deductive skills in order to help them achieve mathematical proficiency.

The six-level curriculum of Let's Start! Maths is based mainly on the Singapore Maths method and follows international standards. The series adopts the model drawing approach which helps students develop a wide range of problem-solving strategies. Let's Start! Maths encourages students' creative and critical thinking and enables them to develop basic mathematical skills such as analysing, reasoning and justifying, making good use of the threestep transition 'concrete-pictorial-abstract' which is crucial to the Singapore Maths method.



COURSE FEATURES

For Students

- cover pages with high-quality illustrations to attract the interest of primary students
- visual and pictorial representations that facilitate learning
- colour-defined frames with detailed theory
- graded activities to enable students to comprehend core mathematical concepts and processes and to ensure the gradual development of mathematical knowledge
- a 'Solve the problems' section that aims to help students strengthen essential problem-solving skills in context, with the help of model drawings
- numerous activities to reinforce students' understanding of mathematical concepts and processes, and develop their problemsolving skills
- a glossary with visual representations, age-appropriate definitions and examples that ensure the gradual development of students' vocabulary
- supplementary theory frames assisting students in further understanding and completing activities





Book



Student's

Digital

Resources



Teacher's Digital Resources





Student's

Book

COMPONENTS







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rimary

For Teachers

- a detailed map of the Student's Book, Workbook and Teacher's Book that helps the teacher understand the structure of each book
- a cover page with a list of the learning objectives, thinking skills, key concepts and warm-up questions in each unit
- step-by-step lesson plans for each unit
- thought-provoking questions that promote exploration of mathematical concepts and processes
- a Mid-Year and an End-of-Year Test with activities to assess students' attainment of knowledge and skills
- revision activities to monitor students' progress
- the key to all Student's Book and Workbook activities
- a pictorial tool (Bar Model Method) to organise and visualise relationships between known and unknown quantities in word problems (introduced in the second level)
- consistency of the mathematical content throughout the series







extra activities for practice in the Workbook





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International Maths Second Edition

Vector International Primary Maths Second Edition is a pioneering series based on the modern principles of Maths teaching, which introduces students to the exciting world of maths. The series aims to captivate students' interest, motivate mathematical investigation and assist students in developing and mastering the skills necessary for success.

This contemporary six-level series for primary students aims to reinforce skills such as critical thinking, problem solving and logical reasoning through a balanced and progressive development of learning objectives. The syllabus is structured in a spiral form to promote a holistic view of Maths and to enhance the interconnection between different domains. Each lesson is carefully designed to enable students to gain a deep understanding of core mathematical ideas.

6 LEVELS up to A2 🔵 🏶



COURSE FEATURES

For Students

- age-appropriate mathematical learning objectives
- a gradual and spiral development of mathematical knowledge
- lessons based on the teaching model of Engage, Explore, Explain, Elaborate and Evaluate (5 Es' Model)
- simple and comprehensible vocabulary to support EAL (English as an Additional Language) students
- gradual development of mathematical terminology and literacy
- visuals and pictorial representations that facilitate learning
- stimulating activities that enhance the consolidation of knowledge and reinforce critical thinking and mathematical reasoning skills
- a special emphasis on the development of problem solving skills
- enjoyable games, puzzles, riddles and crosscurricular activities that enhance a positive attitude towards mathematics
- review pages at the end of each unit
- workbook/supplementary activities for individual practice
- resource sheets to support understanding of mathematical concepts and processes (provided at the back of the Workbook)
- glossary with visual representations, age-appropriate definitions and comprehensible examples
- modern student-friendly layout with high-guality illustration
- extension of mathematical concepts in real-life contexts







Book

Student's

Digital

Resources



Resources



Interactive Whiteboard

Student's Book

vector



For Teachers

- specific learning objectives for each lesson
- consistency of the mathematical content throughout the series
- unit maps at the beginning of each unit to provide well-organised information about the mathematical content of each lesson as well as students' prior knowledge
- list of possible common student preconceptions for each lesson
- cross-curriculum links
- extensive step-by-step lesson plans for all lessons and the review section
- thought-provoking questions that involve higher-level thinking to enrich the lesson content and trigger critical thinking
- differentiated activities for students of basic or advanced performance
- brief description of games, riddles, puzzles and cross-curricular activities
- EAL (English as an Additional Language) support
- review and assessment pages for each unit with detailed guidelines on how to approach and carry out each activity
- keys provided for all the activities
- safety warnings and guidelines
- reminders to facilitate the teaching procedure
- resources such as resource sheets and worksheets to support comprehension and extension of knowledge available on our website www.vectormsint.com
- suggested digital activities using age-appropriate and user-friendly applications for coding, geometry, etc. easily accessible with the use of QR code







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practice in the Workbook



an overview of each lesson with supplementary information for the teachers to monitor the progression of knowledge throughout the units



Primary

2.6 Let's put them together!



LESSON PLAN

How many apples are there allogether?
 Orars's attention to the picture and ask them to say what they can see 6 man in a market, red and green apples, oranges).
 Ask 5s the introductory question flow many apples are there allogether?
 Allow 5s come lines to think about their answers.
 Encourage 5s to express their opinions and initiate a short discussion in class.
 Don't correct Ss' answers at this stage of the lesson.

Draw Ss' attention to the Look! section

 Have Ss count the red apples and then the green apples to find that there are 6 red apples and 3 green apples apples. • Make sure that Ss count correctly (e.g. Some Ss may count some objects more than once or not count some objects at all.). • Explain to Ss that they have to find how many red and green apples there are altogether.



 Explain to 5s that we count all the apples together to find how many there are altogether. Hawe 5s count alcoud with you. Make sure that 5s realise that they should start counting the apples one by one and that the last number they say shows how many apples there are altogether. altogether. • Point out to Ss that there are 9 apples altogether. • Explain to Ss that when we put things together, we Explain to 5s that when we put things together, we add them.
 Write 6+3 = 9' on the board.
 Explain to 5s that we read (+) as 'and' and (+) as 'as', so we say that 6 and 3 is 9.
 Provide 5s with interlocking cubes (2 different colours).
 Encourage 5s to use the interlocking cubes to answer the questions below.

 Draw Ss' attention to the picture in the previous section and ask them How many oranges are there altogether? (There are 8 oranges altogether.), There altogether? (There are 8 oranges altogether.), The are 3 cherries in a basket and 2 cherries in another basket. How many cherries are there altogether? (There are 5 cherries altogether.). Allow Ss some time to think about their answers.

Make sure that Ss answer correctly at this stage of

the lesson. Activities 1. I = a.6 b.5 c.10 2. I = a.3 +4 = 7 b.2 +6 = 8 c.3 + 0 = 3 3. Divide 5s with play dough. I = norvide 5s with play dough. I = norvide 5s with play dough. I = norvide 5s with play dough to the play each I = Have 5s pick a number card out the play each I = norvide 1 = norvid

their cards. Give Ss some time to do the activ

More practice

 Divide Ss into pairs.
 Provide Ss with pencils. Provide Ss with pencils.
 Have each pair make a story problem such as *Kate* has six pencils. Lin gives her four pencils. How many pencils does Kate have now? (Kate has 10 pencils now.).

now.). • Encourage Ss to use their fingers to help them add. • Give Ss some time to do the activity. • Have Ss repeat the activity with different numbers

 Provide Ss with interlocking cube Provide Ss with interlocking cubes.
 Ask Ss questions involving additions of three numbers such as *Kate has 4 cubes*, *Lin has 2 cube and <i>Karin has 2 cubes*, *Now many cubes* do they *have altogether*? (They have 9 cubes altogether).
 Encourage Ss to use interlocking cubes to answer
 Cive Ss some time to do the activity.
 Have Ss repeat the activity with different numbers.
 Make sure that the totals are not more than tent.

Don't forget to prepare the materials and resources for the next lesson.

2.7 Now, let's take away! 🖽



LESSON PLAN

ny birds are th How many birds are there now? I oraw 53 attention to the picture and ask them to say what they can see (a tree, birds, rabbits). Ask 5s the introductory question How many birds are there now? Allow 5s some time to think about their answers. Encourage 5s to express their opinions and initiate a short discussion in class. Don't correct Ss' answers at this stage of the lesson.

Look! Oraw 5's attention to the Look section. • Have 5's count to find how many birds were on the tree and then how many birds new away. • Explain to 5's that there were 7 birds on the tree and then three of them flew away. • Explain to 5's that to show how many birds flew away. we cross them out we cross them out. • Have Ss count with you to find how many birds there are now (4 birds)

Unit 2 - 53

Maths 1, Teacher's Book

detailed and step-by-step lesson plans

Review 🖽

2 Review

Write the no

Tick (/) the correct

52 - Unit 2



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 Activity 1

 • Oraw Ss attention to the pictures and ask them to say what they can see (three paintings).

 • Explain to Ss that they have to tick the correct painting.

 • ← C

Activity 2 • Oraw Ss' attention to the pictures and ask them to say what they can see (2D shapes). • Explain to Ss that they have to write the name of each 2D shape and then count the sides and corners of each 2D shape.



Activity 3 • Draw Ss' attention to the pictures and ask them to say what they can see (three lakes with ducks). • Explain to Ss that they have to write "yes' if they agree and No' if they don't agree with the sentence \Rightarrow a. No b. Yes c. No d. No e. Yes

Unit 2 - 55





extra resources to support learning comprehension

detailed theory sections



Maths 1, Teacher's Digital Resources

Lower Secondary

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Explerers!

Explorers! Maths

VECTOR M & S Publishing Explorers! Maths series is a three-level course for lower secondary students. The series is based on the Singapore approach for maths and covers the learning objectives of various curriculums of Latin American countries. The Explorers! Maths series is designed to help students respond positively towards all maths challenges during the three years of Lower Secondary School.



COURSE FEATURES

For Students

- unit cover pages with short real-life introductions, the learning objectives and mathematical vocabulary of each unit
- detailed theory sections and worked examples to assist students in further understanding the mathematical methodologies
- helpful notes and sections with historical information, questions and problems to trigger students' interest
- various sections with exercises with numerous graded activities
- assessment questions, review pages with activities covering the first and the second half of the book and sections that sum up the meanings of mathematical symbols, terms and concepts

Explorers!

For Teachers

- a detailed map of the Student's Book, the Teacher's Book and the Workbook to help the teacher understand the structure of each book
- a map of the units that contains the theory sections, the learning objectives and the keywords of each unit
- a reduced version of the Student's Book
- step-by-step guidelines for the corresponding theory section in the Student's Book as well as for all the suggested teaching notes
- answers to Student's Book, Review and Assessment activities
- glossary with age-appropriate definitions
- answers to all the activities included in the book







cover pages presenting the learning objectives and vocabulary of each unit

> notes, tips and historical information texts that aim to remind, advise and help students learn and avoid serious mathematical mistakes





Lower Secondary



graded activities



		Glossari	
		Glossar	
	absolute frequency	the number of times a class is confirmed during an experiment or a survey; f	
	absolute value	the distance of any number a from 0 on a number line; a	
detailed	addend	any number that we add	
	algebraic expression	a mathematical expression that includes variables	1
lossary with	altitude	a line segment that joins a vertex of a triangle to the opposite side and is perpendicular to this side	
definitions	angle-side-angle test (ASA)	if two angles of a triangle and the side between them are equal to the corresponding parts of another triangle, then the triangles are congruent	
	ascending	from the smallest to the greatest	
	associative property	for any numbers or variables, a, b and c , it is true that $(a+b)+c=a+(b+c)$ and $(a \cdot b) \cdot c = a \cdot (b \cdot c)$	
	bar chart	an organised way to represent data by using rectangular bars proportional to the values that the bars represent	
	base	(for exponents) the number that is multiplied many times by itself	
	bimodal	a data set that has two modes	5
	bisect	divide into two equal parts	
	bisector	a ray with its end point on an angle's vertex that divides the angle into two equal parts	
	Cartesian coordinate system	a grid used for determing the position of something on a plane	
	centre of mass	the point where all three medians of a triangle meet	
	certain event	an event that is absolutely certain to happen; it has probability of 1	
	circumcentre	the point where all three perpendicular bisectors of a triangle meet	
	circumcircle	the circle outside of a triangle that passes through all three vertices	
	class	a way to group data, each group may include just one data value or each group may contain many data values	
	coefficient	the number that multiplies the variables of a term	
	commutative property	for any numbers or variables a and b it is true that $a+b-b+a$ and $a\cdot b=b\cdot a$	
	concave	(for polygons) having at least one interior angle greater than 180°	
	congruent	being figures with exactly the same shape and size	
	consecutive	one after the other, as they appear in order	
	constant	something that does not change; a term in an algebraic expression that doesn't have variables	
	convex	(for polygons) having all interior angles less than 180°	
	corresponding	matching	07

Algobraio avaroaciona				
Algebraic expressions				
		7	Use known properties to simplify the al	lgebraic expressions. 🔴 🔵 🔵
4 Do the calculations.		_	(a) $2(7p - q) + 3(p + 2q) =$	
Example (a) $3a + 9a = 12a$			(b) −6x + 5[−2x + 3(4 − x)] =	
(a) $5u + 9u - 12u$ (b) $21k - 17k = 4k$			(c) $3[x(2-3y)+5(4-xy)] =$	
$(c) 4x \cdot 5y = 20xy$ $(d) 36t : 6s = \frac{36t}{6s} = \frac{6t}{s}$			(d) 4x + [3x − x + 1 + 2(x − 3)]=	
(a) $11x - 9x - 5x =$		8	Factorise the algebraic expressions. 🧲	
(b) $6ab + ab - 8ab =$			Example	Real fords
$(c) 25rv \cdot 15ab =$			(a) $3x + 3xy + 3z = 3(x + xy + z)$	Factorisation Factorisation is the process of changing an algebraic
(d) 63kl : 9st =			(b) $xy - ay + y = y(x - a + 1)$	expression to an equivalent in the form of a product of two or more factors.
_				Tip
5 Use known properties to simplify the algebraic exp	ressions.			We can use the distributive property to factorise an algebraic expression
5 Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$	ressions.			We can use the distributive property to factorise an algebraic expression.
5 Use known properties to simplify the algebraic exp (a) 16x - 8 - 5x =	ressions.	_	(a) $18x - 18y + 18z =$	We can use the distributive property to factorise an algebraic expression.
Use known properties to simplify the algebraic exp (a) 16x - 8 - 5x =	ressions.		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$	We can use the distributive property to factorise an algebraic expression.
Use known properties to simplify the algebraic exp (a) 16x - 8 - 5x =	ressions.		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$	We can use the distributive property to factorise an algebraic expression.
Ise known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$ (b) $9a - 12 + 3a + 6 =$ (c) $5p - 6a + 7p - 2 =$ (d) $y + x - 3y + 4x =$ (c) $-17x - 4y + 32x + 3y =$	ressions. •		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$ (d) $3xz - 6xy - x =$	We can use the distributive property to factorise an algebraic expression.
I Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$	ressions. •		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$ (d) $3xz - 6xy - x =$ (c) $kl - lx + yl + la =$	We can use the distributive property to factorise an algebraic expression.
I Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$			(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$ (d) $3xz - 6xy - x =$ (c) $kl - lx + yl + la =$ (f) $3a - 6ax + 12ay =$	We can use the distributive property to factorise an algebraic expression.
Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$ (b) $9a - 12 + 3a + 6 =$ (c) $5p - 6q + 7p - 2 =$ (d) $y + x - 3y + 4x =$ (c) $-17x - 4y + 32x + 3y =$ (f) $-10m + 37n - 13m - 31n =$ (g) $3x - 4y + 8z - 9x + 3y - 6z =$ 0 Use the distributive property to expand the algebraic	ressions.		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$ (d) $3xz - 6xy - x =$ (c) $kl - kr + yl + la =$ (f) $3a - 6ax + 12ay =$ (g) $4mn - 16n + 12m =$	We can use the distributive property to factorise an algebraic expression.
3 Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$	nic expressions.		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$ (d) $3xz - 6xy - x =$ (c) $kl - kr + yl + la =$ (f) $3a - 6ar + 12ay =$ (g) $4mn - 16n + 12m =$	We can use the distributive property to factorise an algebraic expression.
3 Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$	aic expressions.		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$ (d) $3xz - 6xy - x =$ (c) $kl - lx + yl + la =$ (f) $3a - 6ax + 12ay =$ (g) $4mn - 16n + 12m =$ Use factorisation and calculate.	We can use the distributive property to factorise an algebraic expression.
3 Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$	aic expressions.		(a) $18x - 18y + 18z =$ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca =$ (d) $3xz - 6xy - x =$ (c) $kl - kz + yl + la =$ (f) $3a - 6ax + 12ay =$ (g) $4mn - 16n + 12m =$ Use factorisation and calculate. (a) $189 \cdot 74 + 189 \cdot 26 =$	We can use the distributive property to factorise an algebraic expression.
3 Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$ (b) $9a - 12 + 3a + 6 =$ (b) $9a - 12 + 3a + 6 =$ (c) $5p - 6q + 7p - 2 =$ (c) $5p - 6q + 7p - 2 =$ (c) $17x - 4y + 32x + 3y =$ (c) $-10m + 37n - 13m - 31n =$ (c) $-10m + 37n - 13m - 31n =$ (g) $3x - 4y + 8z - 9x + 3y - 6z =$ (b) Use the distributive property to expand the algebra 3 Use the distributive property to expand the algebra (a) $(b - c) = (a \cdot b) + (a \cdot c)$ (a) $(b - c) = (a \cdot b) - (a \cdot c)$	aíc expressions.		(a) $18x - 18y + 18z = _$ (b) $26a + 13b - 26c = _$ (c) $abc - ab - ca = _$ (c) $abc - ab - ca = _$ (c) $kl - kr + yl + la = _$ (g) $4mn - 16n + 12m = _$ (g) $4mn - 16n + 12m = _$ Use factorisation and calculate. (a) $189 \cdot 74 + 189 \cdot 26 = _$ (b) $255 \cdot 995 + 255 \cdot 5 = _$	We can use the distributive property to factorise an algebraic expression.
3 Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x =$ (b) $9a - 12 + 3a + 6 =$ (b) $9a - 12 + 3a + 6 =$ (c) $5p - 6g + 7p - 2 =$ (c) $5p - 6g + 7p - 2 =$ (c) $-17x - 4y + 32x + 3y =$ (c) $-17x - 4y + 32x + 3y =$ (c) $-17x - 4y + 32x + 3y =$ (c) $-17x - 4y + 32x + 3y =$ (c) $-10x + 37a - 13m - 31n =$ (g) $3x - 4y + 8z - 9x + 3y - 6z =$ (g) $3x - 4y + 8z - 9x + 3y - 6z =$ 3 Use the distributive property to expand the algebra $a + b + c - (a - c) + (a - b) - (a - c) + (a - b) + (a - c) + (a - c$	ressions. ● ● ● aic expressions. ● ● ● (b) <i>a</i> (<i>b</i> − <i>c</i>) =		(a) $18x - 18y + 18z = _$ (b) $26a + 13b - 26c = _$ (c) $abc - ab - ca = _$ (c) $abc - ab - ca = _$ (c) $kl - kr + yl + la = _$ (f) $3a - 6ax + 12ay = _$ (g) $4mn - 16n + 12m = _$ Use factorisation and calculate. (a) $189 \cdot 74 + 189 \cdot 26 = _$ (b) $255 \cdot 995 + 255 \cdot 5 = _$ (c) $104 \cdot 3 + 104 \cdot 7 = _$	We can use the distributive property to factorise an algebraic expression.
3 Use known properties to simplify the algebraic exp (a) $16x - 8 - 5x = $	ressions. ● ● ● nic expressions. ● ● ● (b) a(b - c) =		(a) $18x - 18y + 18z = $ (b) $26a + 13b - 26c =$ (c) $abc - ab - ca = $ (d) $3xz - 6xy - x = $ (c) $kl - kr + yl + la = $ (f) $3a - 6ax + 12ay = $ (g) $4mn - 16n + 12m = $ Use factorisation and calculate. •••• (a) $189 \cdot 74 + 189 \cdot 26 = $ (b) $255 \cdot 995 + 255 \cdot 5 = $ (c) $104 \cdot 3 + 104 \cdot 7 = $ (d) $252 \cdot 34 + 252 \cdot 66 = $	We can use the distributive property to factorise an algebraic expression.

Lower Secondary

	Map of	the units				
a brief introductio of the uni	on it 5 Agebraic expressions	Theory section Lee 41 Indication biogeneris - Gambailines ours ach a seport 42 Desception - Gambailines ours ach a seport 43 Scientific rotation - Gambailines ours ach a seport 43 Scientific rotation - Gambailines ours ach a seport 43 Scientific rotation - Gambailines ours ach a seport 14 Index ours ach a seport - Gambailines ours ach a seport 15 Appetract - Gambailines ours ach a seport 16 Appetract - Gambailines ours ach a seport 17 Appetract - Gambailines ours acharance 18 Appetract - Gambailines ours acharance 19 Appetract - Gambailines ours acharance 10 Appetract - Gambailines ours acharance	range objectives Repared evers with terms or expressions in the insection that evers with positive, regarine and obsets, effecter from zow, raised with the insection control to the station control to the insection of the station control to the s	blorers! Maths 1, Teacher's Book		
stop-by-stop	6 Croot had a graphs	41 The Cartistian Constitution system Constitution system Constitution system Constitution system Constitution system Constitution Construction Con	elves with the Cartesian to Lascardy fruction to Lascardy fruction to Lascardy fruction to Lascardy fruction to Lascardy fruction to Lascardy fruction to Lascardy to		key to the a	ctivities of
guidelines for the lesson					the Studer	nt's Book
 3 Decimals Statesian to the science of t	<section-header><section-header><text><section-header><section-header></section-header></section-header></text></section-header></section-header>	bits sense yes at a fixed off on Table 2010 the sense yes at a sense of the sense yes at a sense yes at a sense of the sense yes at a sense of the sense yes at a sense yes	 Apply year knowledge Write na mannek, Write Nammer, Marken, Write Nammer, Marken, Ma	92	 3.2 Decimals and fractions Changing decimals into decimal fractions Draw Ss' attention to the theory section Changing dictions are indices of the analysis of the constraint of decimal fractions. Explain to Ss that changing a decimal into a decimal fraction depends on the number of decimal places it has and that the denominators of decimal places it has and that the denominators of decimal places it has and that the denominators of decimal places it has and that the denominators of decimal places it has and that the denominators of decimal fractions. Hawe Ss study how we can write 0.9, 01, 0.451 and 0.067 in the form of decimal places in the form of decimal places. 	srs! Maths 1, Teacher's Book
All about maths - Focus Sx ² attention on the section All about maths. - Point out to St that the number system we use in modern times was born in India. Al-Kwärizmi (around 820 CE) was a great mathematician and astronmer. He wrote a book that included this number system based on Indian mathematics. Later, through Arabic commercial activities this Hindu-Arabic number system was also spread to the western world. In this aroo (0) as a place holder and nine more digits 1.2.3.4.5.6.7.8, and 9 to represent numbers.	With marking its intermediate if if it is it is it is its its its its its i	the shall perform the state of the stat	3.2 Decimals and fn Chaoging decimal Bread of the first state of	Sectors Image: Sector Sectors The decimal function Sectors Sectors Sectors Sectors <	fractions.	Explore
 Explain that the different combinations of these ten digits are called numerals. Place value of decimals Draw Sa attention to the theory section Place value of decimals. Explain to Sa that we can use a place value table to show the value of each digit in a decimal. 	 He whole from the fractional part. Reading decimal numbers Draw S4 attention to the theory section Re. Explain to S5 that when reading decimals, part, then the decimal comma and finally tractional part separately. Ask S6 <i>Mov of oy our cast 94.9422</i> Focus S4 attention on the place value table we read the number 19.482 as nineteen common section. 	ading decimal numbers. we first read the whole we read each digit of the e, and explain to Ss that mma four eight two.	(d) 43.57 (c) or (a) (i) then (b) hundre (c) 1 (c) 1 (c) 0.06 (c) 0.06 (c) 0.08	(e) 114,95 (f) 308,75 smds, 5000 (ii) hundreds, 800 ths, 0.7 (iv) hundredths, 0.03 thts (b) 0.024 (c) 0.109 (d) 0.230 (e) 2,	419 (f) 4.718	(55

'using tech in maths' texts that aim to help Ss become familiar with technology



detailed theory sections ~



Let's Explore! Maths

Let's Explore! Maths is a five-level series for secondary school built on the basis of a balanced progression of mathematical thinking in alignment with the Singapore Maths method and other international standards. This series is designed to ensure a deep understanding of mathematical concepts and skills, and to prepare students for success in various internationally recognised examinations. It teaches mathematics systematically, meets the requirements of the Singapore Maths Curriculum and helps students reach a level of mathematics awareness that facilitates their capabilities in everyday activities.

The concepts and skills covered in Let's Explore! Maths are based on the five pillars of Numbers & Algebra, Problem Solving, Measurement, Statistics & Probability, and Geometry.











5 LEVELS up to C1 🔵 🏶

COURSE FEATURES



- unit cover pages with short real-life introductions, the learning objectives and the mathematical vocabulary of each unit
- detailed theory sections
- worked examples to assist students in further understanding the mathematical methodologies
- helpful sections that help students avoid serious mathematical mistakes, give historical information related to each topic and/or ask questions that trigger students' interest
- 'Apply your knowledge' sections with basic comprehension questions and activities
- 'Exercises' sections with numerous graded activities
- 'More exercises' sections with activities specifically designed to challenge students and extend their knowledge and problem solving skills
- 'Maths as language' sections that sum up the meanings of core mathematical symbols
- 'Unit at a glance' sections that summarise the core mathematical terms and concepts taught in each unit
- assessment questions at the end of each unit for revision and consolidation of the main mathematical concepts
- review pages with activities covering the first and the second half of the book
- glossary with age-appropriate definitions
- answers to all the activities included in the book

For Teachers

- a detailed map of the Student's Book and Teacher's Book to help the teacher understand the structure of each book
- a map of the units that contains the theory sections, the learning objectives and the keywords of each unit
- a reduced version of the Student's Book
- step-by-step guidelines for the corresponding theory section in the Student's Book as well as for all the suggested teaching notes
- answers to Student's Book, Review and Assessment activities







Book





Student's Digital Resources



Student's Book

COMPONENTS

Secondary





2 Factors and multiples



- 2 Factorise each number into a product of its prime factors. (a) 90 (b) 198 (c) 294 (d) 1089 (c) 3087
- 3 Write the HCF for each group of numbers. (a) 147 and 294 (b) 30, 48 and 72 (c) 132, 390 and 212
- 4 Write the LCM for each group of numbers. (a) 16, 24 and 32 (b) 54, 72 and 162 (c) 126, 168 and 567
- 5 Find the square root of the numbers using prime factorisation. (a) 1024 (b) 1521 (c) 4225 (d) 5929
- 6 Find the cube root of the numb (a) 729 (b) 2744 (c)
- 7 Find the difference between the
- 8 There are two metal bars of len length are cut from both metal each short bar.
- 9 4 clocks ring at intervals of 6, 1 ring together at 5 p.m. on a Tuo again?
- 10 Find the HCF and the LCM of product of prime factors in ind (a) 2² × 3³ and 2³ × 3² × 5
- 11 Find the smallest possible integ
- 12 Express 2880 as the product of
- 13 Two numbers are greater than HCF is 1 and their LCM is 391
- 14 During the students' first day at pencils and 660 erasers equally possible number of students at

udent's Book

Secondary

38

72 and 162 (c) 126, 168 and 567	22 aguara of 2 / 2 to the power of 2 / 2 aguarad
bers using prime factorisation.	cube of 4 / 4 to the power of 3 / 4 cubed
4225 (d) 5929	square root of 9
ers using prime factorisation. 3375 (d) 5832	vis cube root of 8
first two perfect squares that end with the	Unit at a glance
gth 72 cm and 96 cm. Short bars of equal bars. Find the largest possible length of	1 The factors of a number divide the number exactly.
	Prime numbers are numbers which have exactly two factors, the number 1 and the number itself. 1 is not a prime number.
sday, when will they next ring together	3 Prime factorisation is the method of expressing a number as the product of its prime factors.
the following, giving your answers as a ex notation. (b) $2^2 \times 3^3 \times 7$ and $3^3 \times 3^2 \times 5$	 The HCF is the largest common factor among all the common factors of two or more numbers. Multiples of a number are produced by multiplying the number by positive integers.
er which can be divided by 2, 5, 6 and 8.	6 The LCM is the smallest common multiple among all the common multiples of two or more numbers
its prime factors in index notation.	7 When we multiply a number by itself, the product is a square number. Squaring integers produces perfect squares. The square root of a perfect square is the absolute value of the integer before
15 and smaller than 25. Given that their find the two numbers.	 squaming it. When we multiply a number three times by itself, the product is a cube number. The cube root of a cube number is the integer before it is multiplied by itself three times.
between the students. Find the largest school that day.	9 Useful properties: For any numbers a, b and for n ≠ 0 and m ≠ 0, it is true that: a [*] × b [*] = (a × b) [*] and a ^{*,a} = (a [*]) ^a .

Maths as language

brief summary 🖌 of the unit

R	ead the questions carefully. For ea	ch question, 4 options a	e given. Circle the correct of	ne.
	What is the HCF of 63, 105, 42 (a) 20 (b)	2 and 294? 21	(c) 22	(d) 23
	What is the LCM of 216 and 1 (a) 354 (b)	44? 495	(c) 432	(d) 583
	What is the square root of 864 (a) 93 (b)	9? 94	(c) 95	(d) 96
	What is the cube root of 33755 (a) 13 (b)	19	(c) 16	(d) 15
	How many factors does the nu (a) 6 (b)	mber 99 have? 7	(c) 8	(d) 9
	Which number is prime? (a) 25 (b)	58	(c) 47	(d) 93
	Which are cube numbers betw (a) 216, 343, 2500, 3600 (b)	een 150 and 1000? 216, 343, 512	(c) 169, 225, 324	(d) 289, 324, 36
C	Which are the common factor (a) 2, 3 (b)	s of 27 and 42? 3, 7	(c) 1, 3	(d) 3, 9
E	What is the first common mul (a) 42 (b)	tiple of 6 and 8? 36	(c) 56	(d) 24
8	What is the product of the HC (a) 5400 (b)	F and LCM of 24, 45 an 3600	d 75? (c) 1800	(d) 2500
	What is √7056 in index notation (a) 3 × 5 × 7 (b)	on? 23 × 52 × 7	(c) 2 ² × 3 × 7	(d) 2 × 33 × 7

numerous

graded activities

's Explore! Maths 1, Si	assessment section for revision and consolidation
Let	detailed glossary with definitions

	Glossa	iry
bbreviation	a brief way to write something	
bsolute value	the distance of any number a from 0 on a number line; $ a $	
djacent angles	two angles that have the same vertex, one common side and nothing else in common	
lgebraic expression	a mathematical expression that includes variables	
lternate angles	a pair of equal angles formed between two parallel lines and a transversal with the angles on opposite sides of the transversal line that crosses the parallel lines	
pproximation	an answer we get by rounding numbers up or down either before calculating or after calculating	
scending	from the smallest to the greatest	
ssociative property	for any numbers or variables, a,b and $c,$ it is true that $(a+b)+c=a+(b+c)$ and $(a\times b)\times c=a\times (b\times c)$	
ar chart	an organised way to represent data by using rectangular bars proportional to the values that the bars represent	
isect	to cut something into two equal parts	5
isector (of an angle)	a ray with its end point on the angle's vertex that divides an angle into two parts equal in value	
lass	a way to group data, each group may include just one data value or each group may include an interval of data values	
oefficient	the number that multiplies the variables of a term	
olumn	a part of a table where people vertically write numbers, words, etc.	
combine	to join two or more things or ideas together	
ommutative property	for any numbers or variables a and b it is true that $a+b=b+a$ and $a\times b=b\times a$	
omplementary angles	two angles that have a sum of 90°	
omplete angle	an angle equal to 360°	
complex	not simple, having variables related in complicated ways	
oncave	being a polygon that has at least one interior angle greater than 180°	
concept	an idea	
onsecutive	one after the other, as they appear in order	
onstant	something that does not change; a term in an algebraic expression that doesn't have variables	
context	the environment or situation in which something occurs	5
onversion	the process of changing something into something else	
onvex	being a polygon that has all the interior angles less than 180°	(191)

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39

•••

Three different bulbs light up at different times. Bulb A lights up every 20 seconds. Bulb B lights up every 54 seconds. Bulb C lights up every 1 minute 15 seconds. If all three bulbs first flash together at 07:30, find the time when the bulbs flash together again.

A man sold lollipops at 40 cents each. He used all the money from selling the lollipops to buy several bottles of mineral water which cost 70 cents per bottle. Find the lowest number of lollipops he could have sold.

3 Find the value of the digit k if the number 14 k95 is divisible by 11.

Let's Explore! Maths 1, Student's Book

vector 32 maths & science

(40)

Review] –	6 1 - 6 Review
Represent the numbers on the number line.	7 Write the HCF and the LCM of the numbers.
(a) odd numbers between 16 and 25	(a) 42 and 54 (b) 84 and 240
<	^S
(b) numbers smaller than 3	
<+++++++++++++++++++++++++++++++++++++	8 Use prime factorisation to find the square and the cube root of the number 4096.
(c) numbers bigger than or equal to 10 and smaller than 20	
<	
(d) 5, 9, 13 and 18	
·····	
Complete the sentences.	ία l
(a) The absolute value of -47 is	<u>ع</u>
(b) The number is the only even prime number.	
(c) 13.5% is equal to the decimal	S
(d) The digit 8 in the number 0.00829 is its significant figure.	Bound off the numbers.
(e) The algebraic expression 56x + 31y has constant term(s).	(a) 7 45196 corrected to 3 decimal places
Write the numbers in order using < or > signs.	(ii) 28 206 apprended to 2 circuit formers
(a) Ascending order: 7 -12 4 0 6	(a) 4 105 200 concreted to 2 significant lightes
(a) Decreating order 1, 72, 7, 0, 0	(d) 003 705 approved to the nearest whole number
(b) Descending order: $\frac{1}{10}, \frac{3}{5}, \frac{2}{2}, \frac{3}{4}, \frac{3}{20}$	(d) 903.703 corrected to the nearest whole number
(c) Ascending order: 3.313, 3.07, 3.309, 3.12, 3.6	10 Evaluate the expressions, if $x = 12$ and $y = -9$.
(d) Descending order: $\frac{6}{10}, \frac{6}{7}, \frac{6}{11}, \frac{6}{8}, \frac{6}{9}$	(a) $10x + \frac{y}{3} =$
Change mixed numbers into improper fractions, proper fractions into decimals and decimals into de	(b) $-(9 x + 24 y) =$
fractions or vice versa.	11 Use known properties to simplify the algebraic expressions.
(a) $5\frac{4}{7} =$ (b) $0.096 =$ (c) $7\frac{3}{10} =$	(1)25-2-1 (2-10-)-
$(4)\frac{725}{10} = (2)\frac{42}{10} = (2)\frac{10}{156} = (2)\frac{10}{156}$	(a) 25x - 5y + (42y - 19x) =
$(1) \frac{1000}{1000} - \frac{1000}{$	(b) $\frac{2}{14}a - \frac{5}{17}y + \frac{10}{28}a =$
Complete the number sentences.	(c) $\frac{54x}{9x\pi} =$
a) -32 - () + 11 = -23 (b) -4 × (-61) × () = 732	(d) -6(y + 11) - 2(y - 35) =
(c) $72 \div (-9) \times ($ $) \times (-2) = -64$ (d) $43 - 12 \times (-3) + ($ $) = -13$	
	12 Do the calculations.
Read the sentences and write Yes or No.	(a) -15.05 × 9.46 =
(a) $\frac{1}{2}$ l is equal to 300 ml of 1000 ml expressed as a fraction.	(b) $[25 \div (-5)] \times (38 + 72) =$
(b) 12 is a common multiple of 36 and 60.	$(0) = \frac{4}{3} + \frac{3}{3} \times (2) = -$
(c) The decimal 3.59595958 is a recurring decimal.	
(d) The number 16 742 rounded to 3 significant figures is 16 700.	
	33

revision pages -

4 Decimals	5 Write the equivalent recurring decimals.
Write the numerals. (a) 54 hundredths	Recurring decimals There are fractions equivalent to decimal numbers that have a repeated pattern of numbers in their decimal part. These decimals are called recurring decimals. Example (a) $\frac{1}{3} = 1 + 3 = 0.333 = 0.3$ (b) $\frac{7}{12} = 7 + 12 = 0.5833 = 0.583$
2 Write the equivalent decimal fractions. (a) 0.06 = (b) 0.23 = (c) 0.749 = (d) 0.003 = (c) 0.048 = (f) 0.815 = (d) 0.0815 =((a) $\frac{1}{6} =$ (b) $\frac{4}{9} =$ (c) $\frac{7}{9} =$ (d) $\frac{5}{11} =$ (e) $\frac{5}{27} =$
Write the equivalent decimals. (a) $\frac{3}{10} = 0.3$ (b) $6\frac{99}{100} = 5.99$ (c) $3\frac{11}{1000} = 3.125$ (b) $6\frac{99}{1000} = 3.125$	Put <, > or = in the boxes to compare. (a) 17.56 (b) 46.9 46.6 (c) 88.88 88.088 (d) 72.450 72.45 (c) 909.9 99.99 (f) 101.8 10.18
(a) $1\frac{1}{10} = $ (b) $1\frac{7}{10} = $ (c) $1\frac{7}{100} = $ (c) $1\frac{7}{100} = $ (d) $9\frac{47}{1000} = $ (e) $10\frac{41}{1000} = $ (f) $12\frac{805}{1000} = $ (g) $25\frac{410}{1000} = $ (h) $31\frac{287}{1000} = $ (h	 Write the numbers in ascending order. (a) 0.189, 0.1189, 0.1198, 0.198 (b) 0.345, 0.0345, 0.3054, 0.3405, 0.05

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'using tech in maths' texts that aim to help Ss become familiar with technology









Secondary





more detailed instructions for complex concepts of higher levels for the teachers

Subjects



Biology



Chemistry



Physics



Earth and Space

CEFR	A	1	A	2	B	1
LEVELS	A1.1	A1.2	A2.1	A2.2	B1.1	B1.2
Science for kids (Pre-Primary) p. 38						
International Science (Primary) p. 42						
International Science (Lower Secondary) p. 48						

Science for kids

Science for kids is a two-year course that introduces very young learners to the world of science. Through this course, students learn about themselves and the environment around them. The series places an emphasis on the observation of the environment and the dynamic of the dialogue. Through questions, our youngest scientists explore their everyday world and develop basic scientific thinking skills which they apply in various subject areas when they enter school.

Children are familiarised with basic scientific concepts, such as family, animals, plants, weather, and the human body.

2 LEVELS up to A1+ 🌑 🛟

COURSE FEATURES

For Students

- illustrated cover pages and vivid pictures that trigger the interest of young learners
- various activities that activate the thinking skills of young learners in a fun way
- extra activities and games to recycle and consolidate learning
- language support with the use of Resource Sheet pages
- self-evaluation sections of everything learners were taught
- flashcards that help students understand the meaning of a word connected to a picture
- revision pages to refresh what students have learnt in each unit
- colour-in pages

For Teachers

- main learning objectives presented at the beginning of each unit
- subjects to spark students' interest
- step-by-step instructions for the teacher to follow
- revision on the vocabulary taught in each unit with the help of flashcards
- lists of the corresponding flashcards, resources and materials necessary for each unit
- crafts sections related to the subject taught
- extra material (posters, additional Resource Sheets, etc.) for more practice
- key to all activities
- optional 'Special Day' activities connected with simple projects related to the theme of the unit









detailed lesson plan

keys to all activities.

Lesson 1.1

Sc

Pre-Primary

Activity 1

What you will need: Flashcards: brother, father, grandfather, grandmother, mother, sister Resources: RP family Materials: A4 pieces of paper, glue, scissors

Have Ss open their book at page 4.

- Draw Ss' attention to the picture, and ask them to say what they see (a family which
- Draw Sa diterition to the picture, and save them to say what they see (a formily which has seven members).
 Draw Sa' diterition to the picture, and, starting from the little child with the word "me", explain to Sa what each member of the family is called according to the relationship with the little child. Make sure you point to each member of the family with your finger while explaining.
 Explain to Sa that mother (or mum) and father (or dad) are the parents of the children.
 Explain to Sa that grandmather (or grandma) and grandfather (or grandma) and grandfather (or grandma) or father (or dad).
 Explain to Sa that when there is more than one child in the family, each child has a brother or a sister.

- in the family, that child has neither a brothen or a sister.
 Ask Ss questions such as the ones below to help them understand the different relationships between each member of the family.
 Do you have a brother or a sister?
 What is your brother's ar sister's name?
 Do you have a grandmather or a grandfather? What are their names?

Flashcard game + Have Ss is in a circle. • Show the flashcards to Ss, say the word of each flashcard and have Ss repeat i after you. Place the flashcards on the floor or on a flat surface so that all Ss can see each image. Make a ball out of paper and give



it to a S. Play a children's song. While the music is playing, Ss pass the ball around the circle. When you stop the music, say the word of a flashcard and the S who has the ball should point to the correct flashcard. • Repeat the activity.

Provide each S with the RP family, an A4 piece of paper, some glue and scissors.

- \triangle Ss should be careful when using scissors
- Ask Ss to cut out the pieces, put them in the correct order and then glue them on the A4 piece of paper.
 Give Ss some time to do the activity.





Lesson 1.1

What you will need: Materials: pencils

Activity 2

Draw lines to match. • Draw Sa' attention to page 5. • Provide each S with a pencil. • Explain to Ss that they should draw a line to match each picture on the left with the correct word on the right. • Give Ss some time to do the activity. P P mother



Play a game. • Divide Ss into groups of 3, 4, 5 or 6. • Ask each group in turn to mime a family. Explain to each group that they should discuss which member of the family each one of them will be. Then, they should act out a small play without tabling and in the end stand still in a position, as if somebody is tabling their phota. • Ask the other Ss to guess which member of the family each child is miming and explain their thinking. Have all Ss mime a member of the family.

Resource Sheet • Ack Ss to turn to page 6. • Show Ss how to hold the pencil correctly in order to write. • Ack Ss to trace the word 'mother'. • Give Ss some time to do the activity.

Note: You can photocopy page 8 of the TB or print the page from our website (www.vectormsint.com) and give it to Ss to fill in. You can keep the RS in the portfolio of each S, in class, until the end of the school year.

7

6

revision pages to the important words





help students revise and concepts of the







International Science

Vector International Primary Science is a brand-new exciting series designed to engage students, spark their interest in scientific knowledge and equip them with the skills necessary to excel in the modern, ever-changing world.

The framework of this innovative six-level course for primary students is designed to provide a comprehensive set of progressive learning objectives for Science and aims to systematically develop practical skills through scientific enquiry. These skills are useful in everyday life and are not limited to Science lessons. The course is organised through the topic-based approach, thus allowing learners to investigate a variety of scientific topics in depth and encouraging them to ask questions, predict, observe, explore, explain, practise, and assess their understanding and abilities.

6 LEVELS up to A2 🔍 🛟

COURSE FEATURES

For Students

- age-appropriate learning objectives
- an integrated approach to the gradual development of scientific enquiry skills
- lessons based on the teaching model of Engage, Explore, Explain, Elaborate, Evaluate (5E Model)
- a special emphasis on vocabulary building and EAL (English as an Additional Language) support
- a focus on scientific literacy and literacy support
- glossary with definitions and pictures
- a section with the necessary materials for each unit
- resources, such as Resource Sheets and Resource Pictures
- a 'Work like a scientist' section with the necessary scientific methods, procedures and tools for each level
- activities encouraging critical thinking and personal response
- independent exploration and lab activities
- homework activities
- end-of-unit review pages
- colourful, high-quality pictures and visuals that assist scientific knowledge
- questions and activities that challenge students to extend or expand their knowledge into scientific concepts
- extension of topics and ideas in real-life contexts
- unit maps which organise and present the scientific concepts of each unit











Interactive Flipbook

Student's Book

Workbook



Book

Student's Digital Resources



COMPONENTS





For Teachers

- learning objectives identified and scientific enquiry skills developed in each lesson
- scientific background information
- lists of student preconceptions and guidance for detecting and reconstructing them
- extensive and detailed lesson plans for all lessons and review sections; ideas and suggestions for teaching scientific enquiry; as well as differentiated activities and questions for students of basic or advanced performance
- guidance for practical activities
- EAL (English as an Additional Language) support
- a focus on higher order thinking questions according to Bloom's taxonomy
- safety warnings and guidelines
- continuous assessment support by various means
- reminders to facilitate the teaching procedure
- digital resources, such as Worksheets, Resource Sheets, Resource Pictures, Language Focus activities and Assessment Sheets
- the keys for all the questions and activities in the Student's Book and the Workbook, as well as the keys for the Worksheets, the Language Focus activities and the Assessment Sheets
- cross-curriculum links
- all sections of the Student's Book are provided for teachers in an easy-to-access form
- optional activities making the lesson more enjoyable and giving further practice





Primary

Sc



Primary





ience 1, Student's Boc

44 Vector maths & science





introduction of each lesson without revealing all the scientific concepts



activities that focus on vocabulary development



International Science

VECTOR M&S International Lower Secondary Science series is a complete three-level course aligned to international standards of education, designed to meet the needs of secondary school students. This series aims to promote a deep understanding of scientific concepts in a friendly environment. A set of learning objectives are achieved as well as a number of practical skills are developed through lessons that stimulate the interest of students and make connections between science and real life.

Split Edition Coming Soon







3 LEVELS up to B1 🔍 🏶

COURSE FEATURES

For Students

- cover pages with information on real-life situations, learning objectives of the unit and guestions on prior knowledge
- high-quality illustrations and photographs
- a wide variety of discussion topics that promote interactive learning
- numerous activities to practise what was learnt in the theory sections, develop scientific enquiry skills through exploration and also challenge the learners with extra information on the topic taught
- review activities that allow the assessment of students' progress
- a section with the highlights at the end of each unit
- an extensive glossary to facilitate the development of students' vocabulary as well as a list with pictures of the laboratory apparatus so that learners become more familiar with the experiment procedure
- a section with information on how learners should work as scientists
- a list of the keywords and an overview of the lesson at the end which help learners summarise what they have covered in the corresponding lesson

For Teachers

- a detailed map of the Student's Book. Workbook and Teacher's Book that helps the teacher understand the structure of each book
- an extensive section with extra theory on the concepts taught in the unit and the corresponding keywords along with keyword information points for the teacher's reference
- detailed tables with the learning objectives, scientific enquiry skills, keywords, Cross Curriculum Links (CCL), materials & resources, and common students preconceptions presented in each lesson as well as a brief summary for each lesson
- step-by-step lesson plans for each unit
- key to the Workbook activities provided at the end of each unit
- digital resources such as Worksheets and Resource Sheets to support comprehension and extension of knowledge
- optional defferentiated activities for further practice
- safety warnings and guidelines
- keys for all the questions and activities in the Student's Book, the Workbook and the resources as well as detailed steps for the implementation of the experiments







Book





Teacher's Digital Resources

Interactive Whiteboard





Student's Digital Resources

cover pages with real-life information, prior knowledge and the learning objectives of the unit

7 💲 Classification of living things

Science around us

me species show areater variation between individuals than other species. In some species, the individuals are very similar to each other. This can be caused by many different factors including human activity. The individuals of the European bison that live today are all offspring of 12 individuals that survived in the early 20th century. Because of extensive hunting, the European bison was almost extinct at that time. This means that the offspring which live today all have very similar characteristics to each other

Another example of a species with individuals with very similar characteristics is the northern elephant seal. The northern elephant seal almost became extinct due to hunting and about 50 individuals survived in the early 19th century. All individuals of the northern elephant seal that live today are offspring of those 50 individuals and show a low variation between them. Low variation in a species can be dangerous for the survival of the species, since all individuals might not be able to adapt to environmental changes or diseases.

Science 1, Student's Book

Revise your knowledge

- What is adaptation? • What is meant by the
- characteristics of an organism?
- What is a skeleton?
 What is the backbone? What is an exoskeleton?

Learning objectives: • Identify living, once alive and ne alive things based on the seven life

- nrocesses Classify organisms into plants and animals and these into smaller
- groups. Classify organisms into vertebrates and invertebrates and these into

Define the term species.

Identify variation within species.

water.

 Use and create simple dichotomous keys to identify organisms

detailed theory sections



7.3 🚯 Classifying animals

Vertebrates

Vertebrates belong to the animal kingdom, and they are all animals which have an inner skeleton with a backbone. There are different groups of vertebrates classified by their characteristics.

Mammals: They are animals with fur or hair on their bodies. They give birth to young, which feed from the milk their mother produces. Mammals have lungs to breathe

Reptiles: They are animals with scales and their skin is dry. They live on land and breathe with lungs. Sometimes we can also see them in the water, but they lay their eggs only on dry land. The shell of their eggs feels like leather.

Fish: They have scales and fins and they live in the water. They lay soft and jelly-like eggs in the water and they breathe with their gills.

Birds: They have feathers, wings and a beak. Most of them can fly and they breathe with their lungs. Birds lay eggs with a hard shell.

Amphibians: They have a wet, smooth skin through which they nave an breath. They also have lungs to breathe, and they spend time both on land and in the water. However, they lay their eggs only in water and they live in the water when they are young. Their eggs are soft and jelly-like

? In which group would you classify a crocodile?



a brief summary with the main concepts of the unit

They were once alive b	but not any more	
Seven life processes Only living organisms carry out all the seven life processes • Nutrition • Growth • Movement • Reproduction • Exercition • Scancitivity	Classification • All organisms are classified into kingd • Kingdoms are then divided into small depending on the characteristics of o Dependent of the characteristics Operation • Vertebrates: monthats, jellyfish, annelids, However, combined on the characteristics However, combined on the characteristics However, combined on the characteristics However, combined on the characteristics Characteristics and the characteristics of the characteristics the characteristic of the characteristics of the characteristics However, combined on the characteristics of the characteristics of the characteristics of the characteristics However, combined on the characteristics of t	oms er groups rganisms Plant kingdom • Ferns • Mosses • Conifers • Flowering plants
Species	ile characteristics that are have	
Has individuals with sim fertile offspring A fertile offspring can h Extinction	nave its own offspring	
Has individuals with sin fartile offspring A fartile offspring can b Extinction When a species does no When a species cannot or loss of habitat Because of natural proc Variation Individuals of a species	nar characteristics that can have have its own offspring ot exist any more adapt to a changing environment resses or human activities	

revision pag	ges 🔨
7 🚯 Review	
 Circle the correct answer. a. A flying bird is a living / non-living b. Something that was once alive but c. Something that is alive is a living / d. A rock is a living / non-living / dee e. A wooden chair is a living / non-living / 	/ dead thing. not any more is a living / non-living / dead thing. non-living / dead thing. d thing. ing / dead thing. g
2. Complete the sentences with the we	movement sensitivity respiration excretion
 a. The process of b. A plant becoming bigger and bigg c. The process of a mother elephant of the process of e. A bird flying in the sky does the pr f. A process that gives energy to an of g. An organism responding to a changer of the process of 3. Match. Write 1 or 2 in the haves The process of 	happens when a human is sweating. ir shows the process of
vertebrates	
conifers	B
mosses	C
organisms that photosynthesise	
organisms that move from place to p	lace E 1. animal kingdom
invertebrates	E Plant Kingdom
flowering plants	G
organisms that eat plants or other ar	imals H
ferns	
166	

vector

1 Solution of the scientific method is something you observe through your senses or even some background information you collect about a topic.

your data.

5 (Analyse your results and draw a conclusion Analyse and interpret the obtained results from your investigation using the appropriate tool. Draw a conclusion based on your results that answers your initial question and determine if your results can be used as evidence to support or reject your hypothesis. If the hypothesis is rejected, you must form another hypothesis and

3 () Form a hypothesis Research and gather information about the topic of your question and form a hypothesis that can be tested.

4 (Heat The hypothesis Make a prediction based on your hypothesis. Then plan an investigation to test your prediction to see if your hypothesis is supported by evidence or not. After that, carry not the investigation concerning the plane of the plane.

out the investigation you planned and collect

A hypothesis can become a theory when a lot of evidence

A hypothesis can become a theory when a lot of evidence has been found to support it and it is repeatedly found to be accepted through different investigations from different groups. But even a theory does not always remain the same. A theory can evolve, adapt, be changed or be rejected and replaced by another theory.

Work like a scientist

In order to understand and explain the processes

and things that happen around them, scientists base their thinking and research on the scientific method. Applying the scientific method as an investigation method ensures that scientists have a better chance of reaching reliable results to support or reject their hypotheses. The steps of the scientific method include:

and things that happen around them, scientists

Scientific method

2 Ask a question Ask a question based on what you observe and you want to learn about. The question must be storbule and bould

be testable and should be answerable through be answerable through scientific investigation. The question also should be exact and accurate and not answerable through personal opinion.

repeat the process from step 3.

6 B Share your results Report the results

to others

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of your investigation and communicate them

Work like a scientist

Fair test

When we plan an investigation, we want our investigation to be a fair test. For this When we plan an investigation, we want our investigation to be a fair test. For this to happen, we should first identify and then list the variables that are involved in our investigation. After that, we should decide which one variable we will change and which one we will measure. The variable we change is the independent variable, while the variable we measure is the dependent variable. All the other variables of our investigation are the control variables which we should keep the same during the entire investigation.

Emily wants to investigate how the height of a ramp from which a toy car will roll affects the distance it travels. For her investigation to be a fair test, Emily lists the variables that are involved in her investigation and decides which the independent, the dependent and the cortor variables of this independent, the dependent and the control variables of this investigation will be.

List of variables height of the ramp \rightarrow independent variable distance travelled by the car \rightarrow dependent variable type of toy car → control variable type of surface on which the toy car rolls → control variable 200

Safe test

In addition to being a fair test, our investigation should also be a safe one. For this to happen, we must also follow some safety rules:

Plan a fair and safe investigation

- 1. Always read and follow the rules of your school
- laboratory. 2. Listen to your teacher and follow your teacher's advice
- 3. Never carry out an investigation that is not approved by
- your teacher
- 4. Wear safety equipment if it is necessary
- 5. Do not drink or smell anything.
- 6. Look for hazard symbols on the containers of substances that you use and take the appropriate safety measures
- 7. Keep in mind that the equipment of a laboratory may be sensitive and may need extra attention when you use it.

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a glossary with detailed definitions

Glossary

- abbreviation*: a short way to write something absorb (for sound): to take in and stop sound instead of reflecting it or allowing it to pass through acids a chemical substance that has a sour taste and pH value between 0 and 7 acid rains: the rain that is more acidic than normal rain due to air pollution

- Act fam, the fam that is more acclude than Horman fam due to air pollution acidit: being a substance that contains acids; being a solution of an acid adaptation: the features of a type of cell that are different to those of other types of cell and that algor ielly; algo substance used in the laboratory to gay microorganisms usually, in a Petri dish algo [c], algage, microorganism usually, in a Petri dish algor [c], and that dissolves in water alkaline being a solution of an alkali alloy; a mixture of two or more different elements, at learnerer: a device that measures the size of an

- least one of which is a metal ammeter, a device that measures the size of an electric current **amper** (A); the unit of electric current **analogue**: a device that displays the measured value using a pointer that moves through a range of numbers

- numbers **lid:** a group of animals of worms with segmented bodies
- segmented bodies arachnict: a group of arthropods with eight legs and without antennae, like a spider arrangement: a specific way in which something is out in order
- arthropod: invertebrate animal group, which includes insects, which have segmented bodies and legs with joints
- ash: the particles that are left after something has
- ash: the particles that are left after something has burnt asteroid belt: a location between the orbits of Mars and Jupiter where we can find most of the asteroids in our solar system atom: the smallest particle of an element atom the substance that has a bitter taste, a soapy feel and a pH value between 7 and 14 basit: being a substance that contains base; being a solution of a base battery: a source of electricle energy, made of two or more cells connected one after the other boiling: the change of state to a gas throughout the whole liquid

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Science 1, Student's Bool

Science 1, Student's Book

- membrane: a thin layer on the outside of the cell that controls the flow of substances into and out of the cell of the cell cell wall: a strong part of certain cells found on their outside (e.g. in plant cells) cellulose: a substance from which cell walls of plant cells are made
- cer

boiling point: the temperature at which a liquid boils and changes into a gas bond (noun): a force that holds atoms together

bond (verb): to join atoms chemically so they are held strongly together in a molecule brass: an alloy of copper and zinc break down: to split a compound into simpler substances

bronze: an alloy of copper and tin
 bulge: something that sticks out from a surface and is round in shape
 burette: special laboratory equipment used for adding measured volumes of a liquid

adding measured volumes of a liquid carbon dioxide (CO₂): a gas that is in the air; a compound of carbon and oxygen atoms carrivore: an animal that eats only animals cell: the smallest building unit of living organisms; circuit component that stores chemical energy which can be transferred as electrical energy round the circuit

brittle: breaks easily into pieces

cell

bronze: an alloy of copper and tir

- ulder: a substance incur winch cen want to permi-cells are made materials like addiments stick together forming sedimentary rock-addiments together forming fulls ergy thementy that is stored in fossil fulls formula (pl. chemical formulae); a way to represent the molecule of a substance, using chemical symbols and the number of the atoms the molecule consists of written in subscript mical property: a property that can only be observed and measured through chemical changes mical reaction: an event in which one or more substances turn into one or more new substance mical symbols and the number of the atoms the advice on the subscript of the substance mical reaction: an event in which one or more mical symbols to unique symbol. formed from
- chemical symbol: a unique symbol, formed from capital and lowercase letters of the latin alphabet, used to represent each element chlorophyll: a substance which is important for photosynthesis and which makes chloropl
- chloroplast: a part of some plant cells in which photosynthesis happens and which is green because it contains chlorophyll cilium (pl. cilia): structures that are part of the cytoplasm of some cells and which look like hair:

7.3 Classifying animals Look at the pictures and tick (v) the vertebrates. Then write the name of the vertebrate or invertebrate group the animal in the picture belongs to, as in the example. B D C Ø F G K 70

() 7.3 2. Complete the sentences with the words in the box. vertebrates invertebrates jellyfish muscles skin mammals fish a. Birds and reptiles are b. _ have fur and give birth to young. c. Amphibians breathe with their lungs and through their ____ d. Arthropods and iellyfish are e. Molluscs have soft bodies with strong f. _____ breathe with their gills. g. _____ have long tentacles. 3. Describe how amphibians and reptiles are different, but also how they are similar 4. Describe how molluscs and jellyfish are different, but also how they are similar. 5. A spider is not an insect. Why?

ower Secondary

a map with extra scientific information, a glossary of the unit and notes for the teachers

Unit map 🚯 7

Classification of living things

Scientific information

Scientific information Benarous disturbed billion years old and life on Earth kas benarous disturbed billion years old and life on Earth kas has been around an earth of a million species on our planet that and be load from the despect occurs to the highest methods there are about al billion years out of the star-tion are load from the despect occurs to the highest herm all. Cassification happens through the comparison of herd to recognise organism and scientists have had disagreements and how to race us a valves all cassified into herd or the work of Cardus Linneaus only described two highters at advisions according to ther characteristics. The happend division is into kingdom, humess only described two highters that advisions according to ther characteristics. The happend envision according to ther characteristics. The happend envision according to ther characteristics. The happend envision hard the animal happend here there append there that advision is into kingdom, howere today why they may happend be also the through the there append happend the planet of kingdoms is three to along time. The most caninax jantar, hang, many concorder bay the along the there append when there append to the through the starter at the ordina of the most caninax jantar, hang, many concorder bay the starter at the ordina of the most dimens, hang, the corder family overside that and the family and the hand here and the family and the starter at the distribution of the higher the starter at the the ordina of the higher the starter at the ordina of the higher the starter at the ordina of the higher the starter at the starter at the ordina of the higher the starter at the starter at the starter at the starter at the st animals, plants, fungi, monera (prokarvotes), and protota. After the division tick hingdown, cryanismis are further divided into phytum, class, order, family, genus and finally into the smallest taxonomic group of species. According to this classification system, each organism has a unique Latin name consisting of two works. For example, humans are named *homo sajpens*, Homo is the genus and sapters is the species. In the example of the common mouse, I is called *Mar musculus* and its classification is the following. Bingdom: aminal, phytume chordiat, class mannals, order: rolents, there are smaller bulgroups after the classification is hased on the classification is the safe species. There are smaller subgroups after the classification into species called subgroups for breds. We usually see such subgroups in animals that have been bred by humans such as pets like cats and dogs. However, breeds are not officially

terms. Defining a species is not an easy task. In fact, it has been a ver-hard task for scientists to define species. The definition of a species is a group of animals with similar characteristics which can reproduce with each other and have fertile offstring. In practice there are many issue with this definition. First, animals may live in very different geographic locations so we cannot easily work if they can regord the classifier of the offspring. Second species evolve. The species of the past are to the same today. Vioution is its very in understanding how species change and evolve with time.

species change and evolve with time. Today, some of the issues with defining species are being solved by modern technologies including DNA sequencing, solved by modern technologies including DNA sequencing, the DNA of each organism or species, and they can tread its sequence and compare it to other organisms. By doing this they can see the degree of similarity between organisms and also understand if organisms have a similar ancestor through evolution. All in all, even it technologies and categories change, the logic behind classifying organisms have distance through the yeas. The classification of living organisms is a very useful tool to recognise organisms according to the characteristics in order to study them in according to the ming.

Language focus

There are plenty of new terms in this unit. Spend the time needed to study them in detail and ensure you illustrate their use orally and in writing during the following lessons. Give Ss motivation and opportunities to use these terms themselves.

relid: a group of animals of worms with s anrenue, a group of animas of minima with segmence boue arachnick a group of arthropods with eight legs and without antennae, like a spider arthropod: invertebrate animal group, which includes insect which have segmented bodies and legs with joints

7 🐧 Unit map

classification: the process of sorting organisms or things into groups according to shared characteristics cone: a dry part of conifer plants in which the reproductive structures, like the seeds, are kept

- conifer: a group of plants that have needle shaped leaves and make cones in which seeds are kept
- dichotomus (for identification keys): when the questions of the key have only one of two answers, yes or no earthworm: a common type of an annelid worm that lives in the ground
- chinodem: invertebrate animal group which live in the water and the bodies of which are hard outside and covered with spikes cerebian: the process of removing waste products from the body
- ternal: referring to the outside part of something

- eternat: referring to the outside part of something extinction: the situation in which there are not any individuals of a species alive, when a species goes extinct ferm: aroup of plants which reproduces with spores and does not have flowers features: aroup or downs with that non-segmented bodies prowth the process of changing to be larger in size, height identication: the process by which something is recognised identification: the process by which something is recognised identification: the process by which something is recognised identification: the process by which something is recognised identification the approxemant bout their characteristics individual: one single organism
- individual: one single organism infertile: not being able to reproduce and create new org
- invertebrate: an animal that does not have an inner skeleton with a backbone with a backbone stylight, invertebrate group of animals that live in the water and have a so that algeliy-like body with tentacles and stinging cells ingdom: the largest group into which living organisms are classified

- ollusc: invertebrate animal group with a soft body with strong muscles Ses: a group of plants that do not have real roots or flow and reproduce with spores

- nematode: a group of worms with soft, thin and non-segmented bodies nutrition: the process of a living thing getting or making substances it needs
- offspring: organisms created by the reproduction of their parents

- parents reproduction: the process of producing new living things of the same kind; having young respiration: the process of getting energy from food which happens in every cell of an organism sensitivity; the ability of living organisms to respond to a change in their environment.
- change in their environment species a group organisms of the same type with similar characteristics which can reproduce with each other and create new organisms that can also reproduce spore: a reproductive body of some plants like mosses starfash an invertebrate echinoderm animal that likes in the sea and has a sut shape usually with five arms
- stinging cell: a type of specialised cell found in some animals that contains chemicals which can harm other organisms when in contact
- when in contact tertade: a long and soft organ that can be found in jelly/fish and other animals, they might seem like arms or antennee aritation differences in the characteristics of organisms that might otherwise look very similar ertebrate: an animal that has an inner skeleton with a backbone
- rm: a type of invertebrate animal without arms or legs that usually moves by crawling

Be aware

Be aware The word registration' can have different meanings. In this unit, registration is the process of patting energy from food which happens is every call of an organism. However, in everyday life this word can also mean the process of breathing. The word kingdom can have different meanings. In biology' kingdom's a dassistication terms of a large groups of organisms with certain similar characteristics, like the plant kingdom and the aminal kingdom. However, in everyday life the word is also used to describe a territory governed by a king or queen.

200

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extensive and detailed lesson plans for all lessons and review sections; ideas and suggestions for teaching scientific enguiry; as well as differentiated activities and guestions for students of basic or

advanced performance



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Resource Sheet

Cockchafe

Spider

Ant

Mite

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Bee

Cockroach



<u>-ower Secondary</u>



Facts about asteroids

Our solar system consists of millions of asteroids while more than 1 000 000 of them are known. Asteroids are lumps made of rock with an irregular shape. They are generally grey in colour and most of them have craters on their surface resulting from collisions with other objects.

Asteroids vary in size. Their diameters range from a few metres for the smallest, to a few hundred kilometres for the largest. The largest asteroid found so far is the asteroid Vesta which is close to 525 kilometres in diameter Asteroids along with comets and meteoroids are some of the smallest objects that make up our solar system

Example

high-quality

illustrations

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vector

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How many times wider is the Moon than Vesta, if the Moon's diameter is 3475 km? Round of your calculations to 2 decimal places.

To find how many times wider the Moon is than Vesta, we should divide the diameter of the Moon by that of Vesta. So, $\frac{3475}{525} = 6.62$. Therefore, the Moon is approximately 6.62

times larger than Vesta.

Asteroids were formed in the early stages of Actional were formed in the early steges of the formation of our solar system. These small pieces of rock are the leftovers of the nebula from which our solar system was born 4.6 billion years ago, which did not manage to grow large enough to become planets. Some asteroids were part of larger objects, like planets, moons, or bigger asteroids, that broke off after colliding with another object.

Since asteroids are small objects, compared to planets, their gravity is small and therefore the materials, i.e. the rocks, from which they are made are not strongly held together. This results in their shape sometimes changing due to the tidal forces exerted on them by larger solar system objects. Also, only a few large asteroids have their own moons, e.g. Didymos with its moon Dimorphos.



Some asteroids may be made of different pieces of rock, while others that are small and spin quickly are made of only one piece of rock. This can be explained because their low gravity would not hold different pieces of rock togethe

> important concepts and ideas presented in the lesson

12.1 🔞 Properties of magnets

Poles of a magnet



Asteroids orbit the Sun. The majority of asteroids known to us are located in the **asteroids belt** between the orbits of Mars and Jupiter, while others share the orbit of a larger planet. Jupiter has one of the largest and most important populations of such asteroids known as Jupiter trojans. However, Jupiter is not the only planet with this characteristic. Even Earth has two asteroids with which it shares its orbit, with the first discovered in 2011 and the second in 2021. In addition, there are also some asteroids whose orbits pass close to (Near-Earth Asteroids) or even cross Earth's orbit (Earth-crossers). Earth's orbit (Earth-crossers)

Asteroid impact on Earth

In some cases, the orbit of an asteroid can change. When an asteroid passes close by a planet or a massive object, the force of gravity exerted by the planet on it can pull the asteroid out of its orbit. For example, it is possible for the Earth to exert such a large force of gravity on an asteroid that it pulls it towards it. If this happens, an asteroid <mark>impact</mark> may occur on Earth's surface. Another way for an asteroid impact to happen is with an asteroid whose orbit crosses the Earth's orbit.

One asteroid impact with Earth, known as the Chicxulub impact, is responsible for the extinction of the dinosaurs and 75% of species 66 million years ago. On the other hand, another asteroid impact with Earth is also believed to have been the cause of the star of life on Earth Asteroids hit the Earth very

Magnetic interactions

Magnetic materials

There are natural magnets as well as man-made ones

Lodestones are natural magnets that contain the mineral magneti Magnetite is a naturally occurring magnetic material, which consis of iron oxide, a chemical compound of iron and oxygen.

However, most of the magnets we use today are man-made. They are made from magnetic materials formed into different shapes.

Magnetic materials are iron, nickel and cobalt, and some of their alloys, like steel. All other materials are not magnetic, including all other metals like aluminium, silver and copper.

Magnetic materials have little groups of atoms that act like tiny magnets These are called magnetic domains. In a magnetic material the domains have a random direction, but when a magnet gets close to it, they all line up having the same direction.

Magnetic materials can be magnetised, which means that they can becom magnets. One way to magnetise a magnetic material, e.g. a steel nail, is to stroke it with a magnet many times and in the same direction each time.

Which side of the iron bar will be the north pole, and which will be the south pole?

Magnetic materials are always attracted by magnets. The magnet does not have to come into contact with the magnetic material in order to exert a force on it. The magnetic force acts from a distance. Magnetic force is a non-contact force.

Anon-contact rote: Magnets interact with each other with magnetic forces too. If we bring the unlike poles of two magnets attract each other. But if we bring the like poles of the ma we will notice that the magnets attract each other.

1 What will happen if the south poles of two magnets are brought together?

frequently. Whethe an asteroid coming towards Earth pose



a threat depends on its size. Most asteroids that come towards Earth are small enough to burn up in the Earth's atmosphere, and thus do not reach the surface, so they are not considered dangerous. However, medium-sized asteroids may hit the Earth and cause little or local damage to the area while large-sized asteroids may

cause extinction

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Science 2, Student's Book

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Special Editions in Science









Beyond Maths & Science...

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MM Publications is a member of MM Educational Group, an international publishing group that delivers educational materials and services in four subject areas: English Language Teaching (ELT), Computing – ICT, Maths and Science.

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The other members of MM Educational Group:

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MM Publications is an international publishing house that specialises in ELT books and materials, as well as services to support teachers and educational institutions worldwide. It was established in 1993 but has grown substantially since then. Today, materials by MM Publications are used in state and private schools at all levels of education. In fact, various customised editions have been developed to suit the diverse needs of unique markets.

binarylogic

Binary Logic has been at the forefront of technology since 1982, building a global reputation through quality educational resources and support services. The founders of Binary Logic are educators who invested in technology early on. Hence, they developed a Computing & ICT curriculum for K-12 and tertiary education, changing the way the subject has been taught and learnt over the last 20 years.



focus on digital services

Focus on Digital Services designs and develops books and e-learning materials for students and teachers worldwide. The creative, top-notch members of this team deliver both superior quality and contemporary design.

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Prime Educational Software Applications develops high-quality digital tools and software for education. The company leverages the latest technology, in order to digitise the content created by MM Educational Group and thus enhance the overall educational experience.



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MM Schools is the birthplace of MM Educational Group. Since 1974, this state-of-the-art educational institution has offered substantial insights on ELT methodologies. To this day, it continues to be a source of inspiration, as it provides a unique opportunity to pilot educational products with students whose first language is not English.



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Combo Books promotes, sells, and distributes the products of MM Educational Group in Greece, Cyprus, and the Balkans. It also organises and administers language examinations in collaboration with Palso, Europalso, and the Greek Ministry of Education.



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One of the aims of the Common European Framework (CEFR) is to describe the levels of proficiency required by existing standards, tests and examinations in order to facilitate comparisons between different systems of qualifications. For this purpose, the CEFR Levels have been developed. The table below summarises the set of proposed CEFR Levels in single holistic paragraphs and provides teachers and curriculum planners with orientation points.

CEFR LEVELS: Global Scale

Can understand with ease virtually everything heard or read. Can summarise information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express himself/herself spontaneously, very fluently and precisely, differentiating finer shades of meaning even in more complex situations.

C1 Can understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express himself/herself fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organisational patterns, connectors and cohesive devices.

B2 Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.

B1 Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.

A2 Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.

A1 Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce himself/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

Throughout this catalogue, the correspondence of Vector books and materials to the CEFR is presented in order to facilitate teachers.

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