



外研社

外研社新思维科学、数学

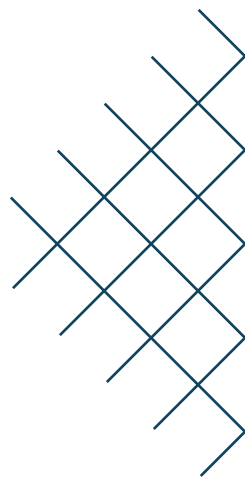
项目介绍





目录



1. 新思维科学介绍
 2. 新思维数学介绍
- 

新思维科学、新思维数学

出版机构与编写团队

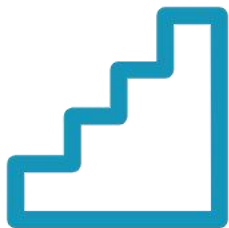


外语教学与研究出版社
FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

类别	新思维科学	新思维数学
1-3级	Jon Board Alan Cross	Cherri Moseley Janet Rees
4-6级	Fiona Baxter Liz Dilley	Emma Low Mary Wood
7-9级	Mary Jones Diane Fellowes-Freeman Michael Smyth	Lynn Byrd Greg Byrd Chris Pearce

新思维科学、新思维数学

级别与学段



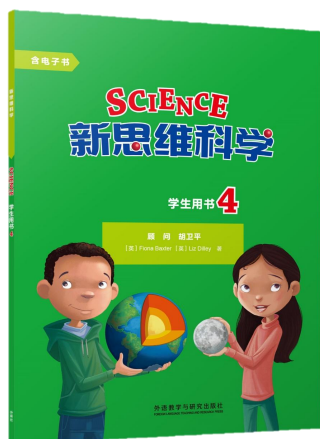
- 课程共分9个级别
- 适用于国际学校、外语特色校等一至九年级的师生
- 对接Cambridge Progression Tests
- 对接Cambridge Checkpoint Tests



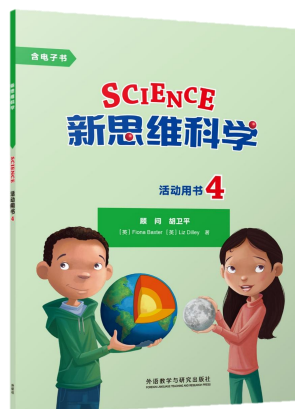
新思维科学、新思维数学

系列构成	新思维科学			新思维数学		
	学生用书	活动用书	教师用书	学生用书	活动用书	教师用书
纸质材料						
数字资源	电子书 <ul style="list-style-type: none"> 多终端阅读 具有缩放、跳转至指定页面 全屏阅读、目录跳转等功能 		教学资源含： <ul style="list-style-type: none"> 教材设计理念 课程介绍材料 活动记录单 语言练习题 前测试卷及答案 词汇 	电子书 <ul style="list-style-type: none"> 多终端阅读 具有缩放、跳转至指定页面 全屏阅读、目录跳转等功能 		教学资源含： <ul style="list-style-type: none"> 教材设计理念 课程介绍材料 活动记录单 语言练习题 前测试卷及答案 词汇

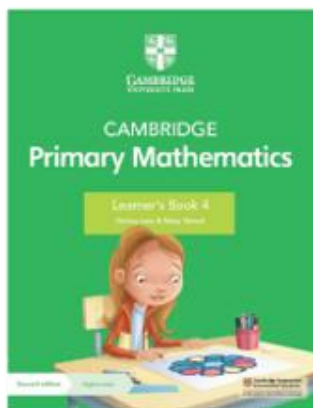
新思维科学、新思维数学



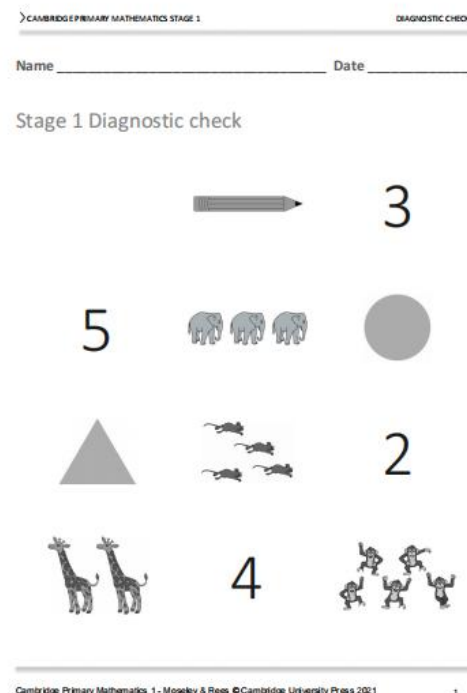
学生用书



活动用书



教师用书



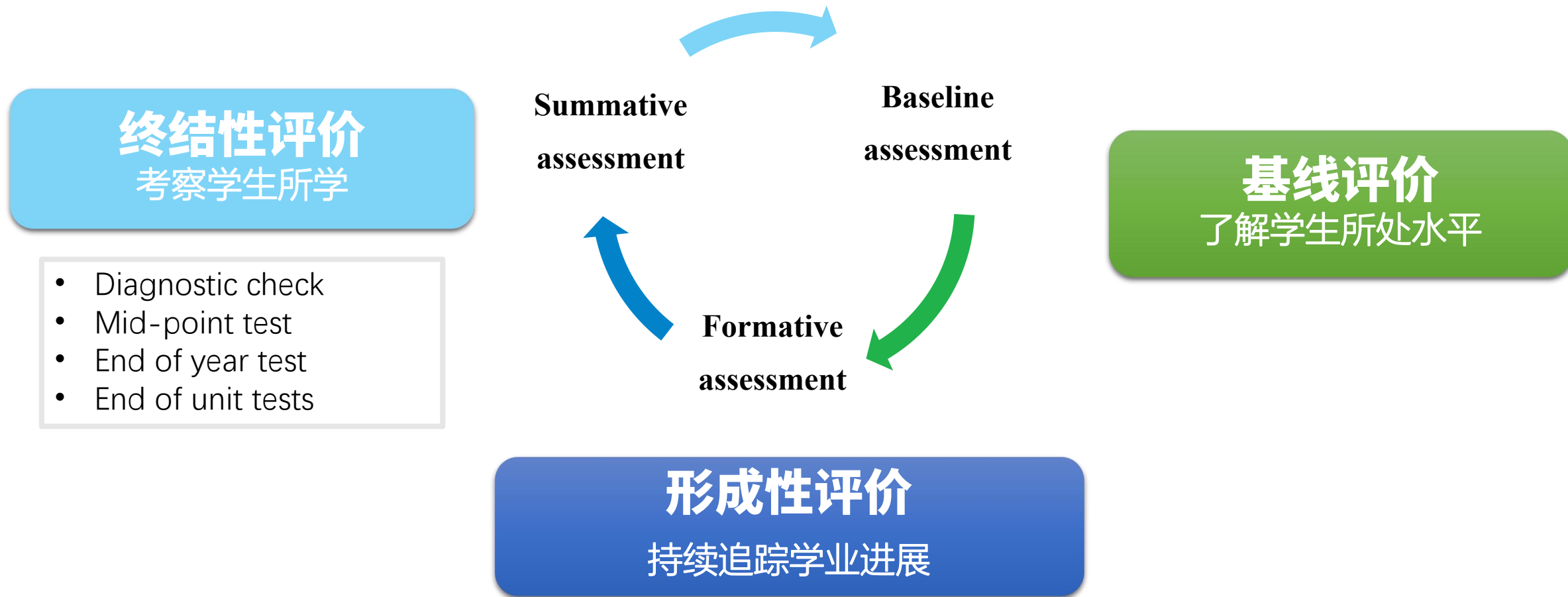
诊断测评



活动记录单

配套完备资源，教学测评研一体化解决方案，有效支持教与学

新思维科学、新思维数学



01.

新思维科学



Cambridge Primary and Lower Secondary Science

01.

新思维科学：课程亮点



- 《新思维科学》（Cambridge Primary and Lower Secondary Science）引进自**剑桥大学出版社**的国际化科学教材
- **科学+英语**，素养齐发展
- 涵盖**科学教育四大领域**——生物、物理、化学、地球与宇宙
- 涵盖剑桥小学和初中**科学课程框架**的要求
- 倡导学生**像科学家一样思考和工作**



新思维科学：课程亮点



CAMBRIDGE UNIVERSITY PRESS

Earth and space

3 Rocks, the rock cycle and soil

What are igneous rocks?

The word 'igneous' means fire. Igneous rocks come from magma that has cooled into solid rock. Magma is hot, like a fire.

Look at the diagram. Notice that magma is coming from the mantle, deep below the Earth's surface. When magma cools it turns into a solid. This process is called **solidification**.

Some of the magma comes out at the surface as lava. When the lava cools, it solidifies into an **extrusive igneous rock**. 'Extrusive' means outside the Earth's crust on the surface. The photograph on the opening page of this unit shows this happening. The rock is a black rock called **basalt**.

Some of the magma stays inside the Earth's crust. It cools down more slowly than the lava and solidifies into an **intrusive igneous rock**. 'Intrusive' means inside the Earth's crust. An example of an intrusive igneous rock is **granite**. On the diagram you can see that when the rocks above the intrusive igneous rock wear away, the granite appears at the surface.

4 Earth and its habitats

Here is a diagram to show the internal structure of the Earth. The structure is made up of different layers: the **crust**, the **mantle** and the **core**.

Crust

The crust is the thin outer layer of the Earth where we live. The crust is formed of rocks. Under the oceans the crust is about 5 km thick. Under the land the crust is about 70 km thick. The temperature of the crust increases from 20°C at the surface to 400°C at its deepest part.

Some of the magma forces its way through cracks in the sides of the volcano. When this magma erupts it forms baby volcanoes called **secondary cones**.

Questions

Look at the photograph of flowing lava on the right.

- Point to the lava that is still flowing.
- Point to the lava that has cooled down and hardened into rocks.

Look at the diagram of a volcano and the photograph of a volcano. The diagram is a model of the real thing.

- Talk about features of the volcano that you can see on the photograph and the diagram.

Land and oceans

Climate

Atmosphere

Life of our planet

Solar System

Earth's formation

Geology

Earth and Space

4 Earth and its habitats

4.1 The structure of the Earth

We are going to:

- describe a model of the structure of the Earth
- draw a model of the structure of the Earth

Cutting started

The photograph of Earth was taken from space.

- What shape is the Earth?
- What does the surface of the Earth consist of?
- What do you think might be underneath the surface?
- The solid outer part of the Earth is called the **crust**. Use the model to describe how the crust becomes thinner as you go deeper into the Earth. What do we call this change?
- What provides the energy that makes the crust change into what you see in the photograph?

Questions

- Describe the internal structure of a peach.
- Draw the second stage of the internal structure of a peach.
- Name the two layers which make up the internal structure of a peach.

What is inside the Earth?

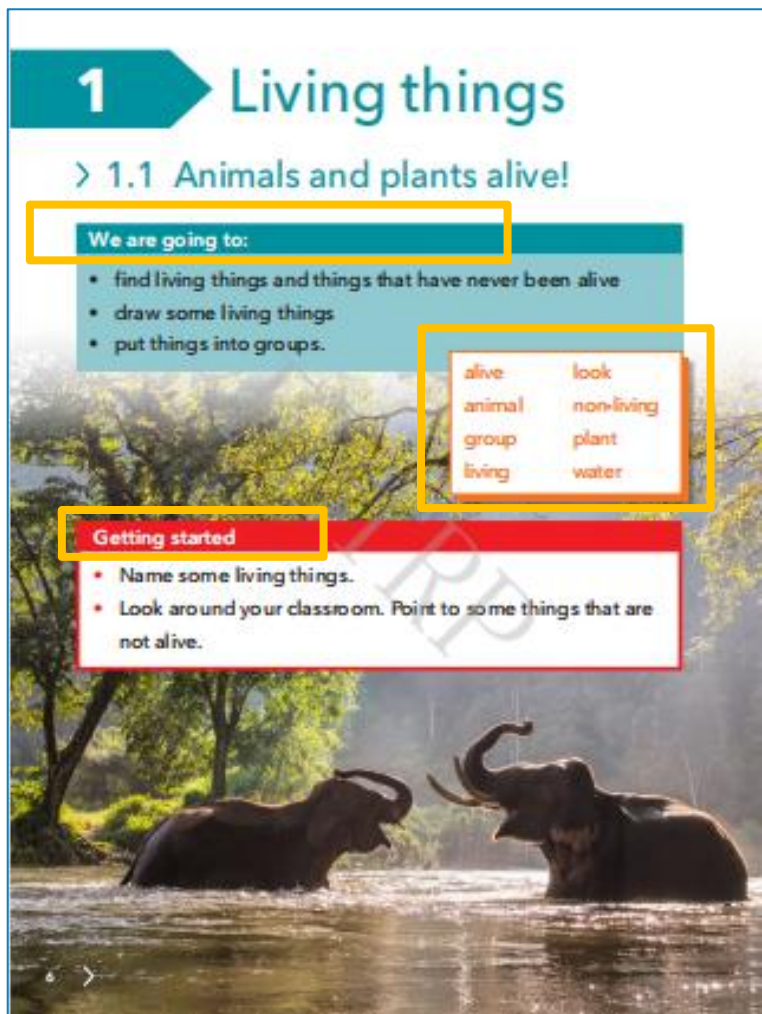
We already know that the outside part of the Earth is not all water. We call this the **Earth's internal structure**. But how can we find out about the parts of the Earth that are hidden? These parts make up the **Earth's internal structure**. We can't see them, but we can use a model to show what they are like.

Remember we often use models in science. Sometimes models help us to understand how something works. So models can help us to see what something looks like that we can't see or feel.

To look at the internal structure of the Earth, we need a model to show what the Earth would look like if we could cut it open. We can do this with a peach. Here is a whole peach and a peach that has been cut open to see the inside.

01.

新思维科学：学生用书



We are going to
明确学习目标

Getting started

激活已知，激发思考，为接下来的学习做准备

Key Words

列出本课涉及的核心词汇

新思维科学：学生用书



1 Living things

Activity

Living or non-living?

Zara is putting things into two groups.
Where should she put the toy?
What other things could she put in the groups?
Look at the non-living things.
Point to something that used to be alive.
Point to some things that have never been alive.
Make a group of living things and a group of non-living things.
Use things from your classroom.
How do you know which things are alive?

How am I doing?

Ask a friend to look at your groups.
Have you put things in the right group?

How does putting things into groups help you learn science?

Look what I can do!

- ☐ I can name four or more things that are living.
- ☐ I can name four or more things that have never been alive.
- ☐ I can draw some living things.
- ☐ I can put things into two groups.

8 >

4.1 Characteristics of living organisms

- Another word for taking in nutrition is
- Polar bears can sense things in their environment. For example, with their nose they can sense the of meat.
- All living organisms excrete waste substances. Animals excrete when they breathe out.
- Living organisms to make more of the same kind of organism.
- Young plants and animals get bigger. This is called
- All living organisms break down some of the food they eat, to provide them with energy. This happens in a process called
- Most living organisms can change the shape and position of their bodies. This is called

Activity 4.1.1

Is a car alive?

The picture shows a car.

Here are some facts about cars.

- Cars use fuel and oxygen.
- Inside the engine of the car, the fuel and oxygen provide energy to make the car move.
- The engine produces waste gases, including carbon dioxide. These are given off in the exhaust of the car.
- Some cars have sensors. For example, they can sense when it is dark and turn the lights on automatically.

Questions

- In your group, make a list of similarities between a car and living organisms.
- Make a list of differences between a car and living organisms.

Summary checklist

- ☐ I can list the seven characteristics of living organisms.
- ☐ I can describe the meaning of each of these characteristics.

129 >

Activity

设置丰富多彩的探究
实践活动

01.

新思维科学：学生用书



1.1 Animals and plants alive


Use your eyes to **look** at the picture. What can you see?
Point to a **plant**. Most plants are green.
Plants make their own food.
Point to an **animal** in the picture.
Animals move around and eat other things.
Plants and animals are **alive**.
They are **living** things.
All living things need food.
Water moves but it is not alive.
Point to what is **non-living** in the picture.

Think like a scientist

What living things can we find?

You will need:
paper, a pencil, a clipboard or thick card to rest on,
a digital camera

Go outside to look for living things.
Be careful in case there are plants or animals that are prickly, sting or bite.
Try to find four living things.
Draw and photograph some living things.
What is the largest living thing you can find?
What is the smallest living thing you can find?



Think like a scientist

建构科学概念，解决科学问题，发展
科学思维，提升科学能力

新思维科学：学生用书



1 Living things

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8 >

Look what I can do!

帮助学生总结反思本课所学

01.

新思维科学：学生用书

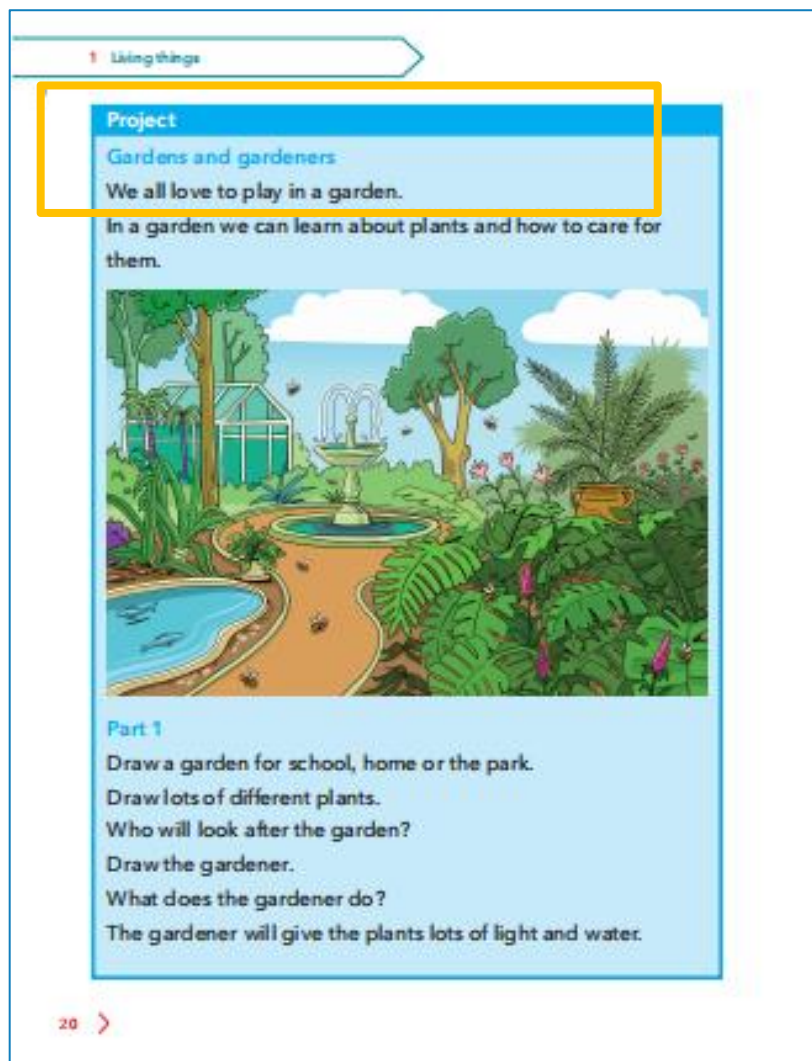


Check your progress

通过一系列问题测试学生对这一单元主要内容、核心概念和核心语言的掌握情况

01.

新思维科学：学生用书



Project

让学生运用所学的知识和技能，
解决实际生活中的科学问题，或
者制作一些科学作品



1 Living things

> 1.1 Animals and plants alive!

Focus
1 Colour in only the things that are alive.

2 >

1.1 Animals and plants alive!

Practice
2 Draw lines from these things to the right group.

lion Sun tree

Non-living Living

water butterfly chair

3 >

6.5 Magnets can pull

Challenge
4 Magnets pull magnetic materials towards them.
Look at the pictures. Some materials are magnetic and other materials are non-magnetic.
Draw arrows to show the pulling force on the magnetic materials.

Why does the magnet not pull on the rubber balloon?

79 >

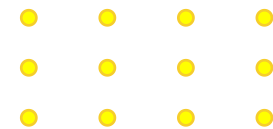
Focus: 掌握基本知识

Practice: 提升运用知识的自信心

Challenge: 引发深入思考

02.

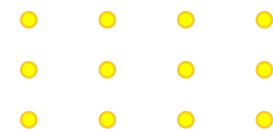
新思维数学



Cambridge Primary and Lower Secondary Mathematics

02.

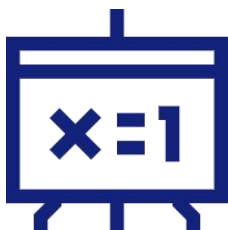
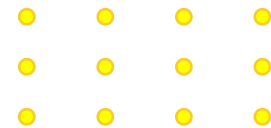
新思维数学



- 《新思维数学》（Cambridge Primary and Lower Secondary Mathematics）引进自**剑桥大学出版社**的国际化数学教材
- **数学+英语**，素养齐发展
- 涵盖**数学教育四大领域**——数，代数，几何与测量，统计与概率
- 涵盖剑桥小学和初中**数学课程框架**的要求
- 倡导学生**像数学家一样思考和工作**
- 在问题解决中培养**八种数学思维**

02.

新思维数学



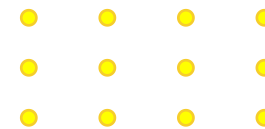
1.1 Counting sets of objects

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

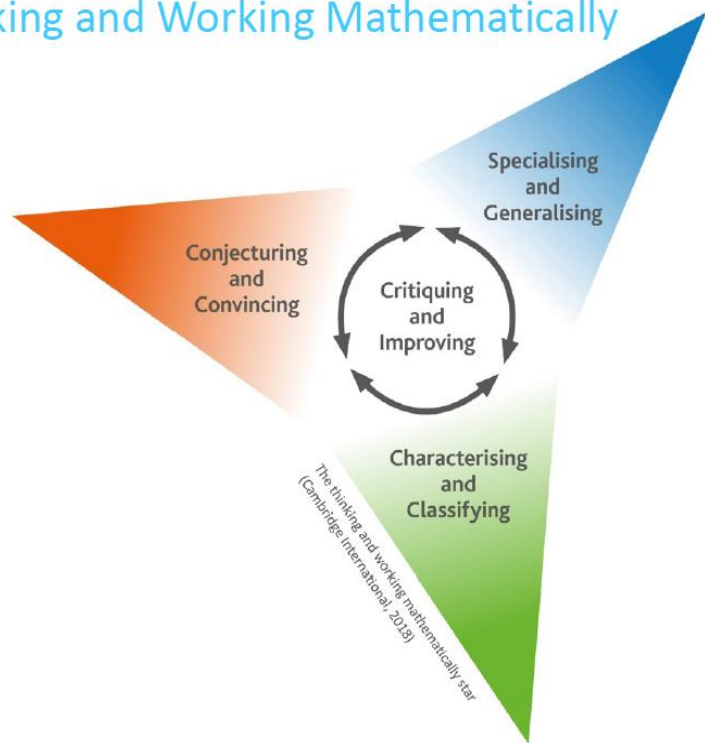
覆盖数学教育四大领域，严格匹配剑桥考纲

02.

新思维数学



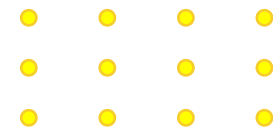
• Thinking and Working Mathematically



Thinking and Working Mathematically characteristic	Definition
Specialising	Choosing <i>an example</i> and checking to see if it satisfies or does not satisfy specific mathematical criteria
Generalising	Recognising an underlying pattern by identifying <i>many</i> examples that satisfy the same mathematical criteria
Conjecturing	Forming mathematical questions or ideas
Convincing	Presenting evidence to <i>justify or challenge</i> a mathematical idea or solution
Characterising	Identifying and describing the mathematical properties of an object
Classifying	Organising objects into groups according to their mathematical properties
Critiquing	Comparing and evaluating mathematical ideas, representations or solutions to identify advantages and disadvantages
Improving	Refining mathematical ideas or representations to develop a more effective approach or solution

倡导像数学家一样思考和工作


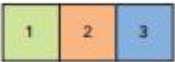
新思维数学：学生用书





1 Numbers to 10



Getting started

1 How many hippos are there?
Draw a ring around the number that matches the set.

2 Count the toys and write the numbers.

3 Write some numbers you know in the space below.

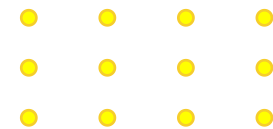
Tell your partner something about each of the numbers you wrote.

10 >

Getting started

激活已知，激发思考，为接下来的学习做准备

新思维数学：学生用书



1 Numbers to 10

> 1.1 Counting sets of objects

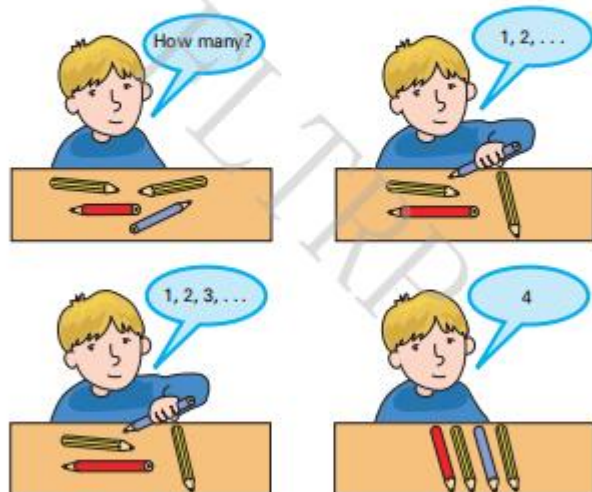
We are going to ...

- count sets of objects.

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

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

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

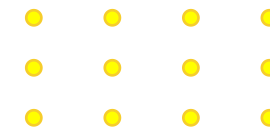


count estimate how many set total

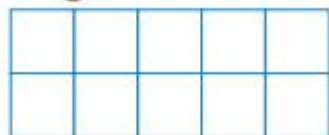
We are going to
明确学习目标

02.

新思维数学：学生用书



1.1 Counting sets of objects

Draw 0 counters  in the ten frame below.

0

Worked example 1

Which domino has 4 spots?



Answer:

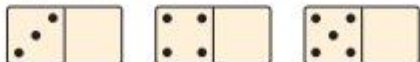


This one!



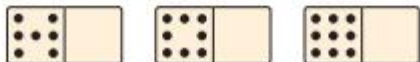
4 Which domino has 5 spots?

Draw a ring around the correct domino.



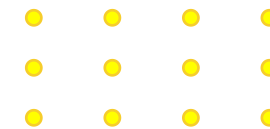
5 Which domino has 9 spots?

Draw a ring around the correct domino.



Worked example

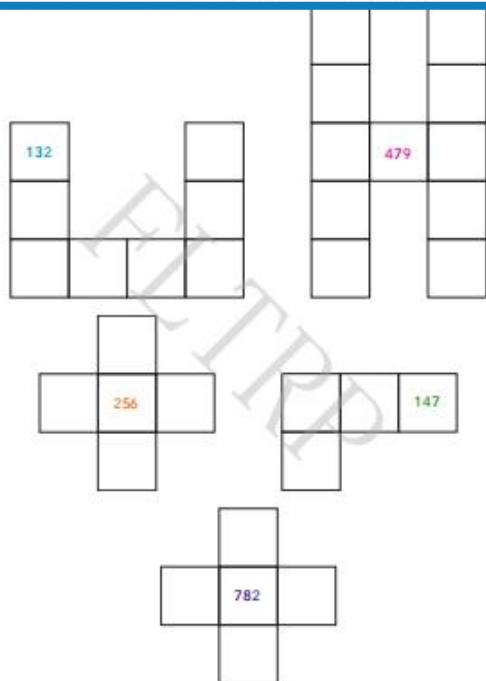
一步一步展现解决问题的方法



1 Numbers to 1000






Exercise 1.1

1 Complete these pieces, which are from a 1 to 1000 number strip.



1 Numbers to 10

8 Look at the picture on the previous page.
Estimate then count. Write the numbers.

				
Estimate	Estimate	Estimate	Estimate	Estimate
Count	Count	Count	Count	Count

Let's investigate

Work with a partner.

Make a poster all
about a number.
Talk about your
poster with your
class.

Look what I can do!

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



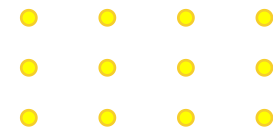
Exercise

Let's investigate

让学生像数学家一样思考和
工作

02.

新思维数学：学生用书



1.1 Hundreds, tens and ones

6 Use these number words to write four 3-digit numbers in words.

hundred eight and seventy- fifty- three

1 _____


2 _____

3 _____

4 _____

Look what I can do!

- ☐ I can say, read and write numbers and number words from 0 to 1000.
- ☐ I know the value of each digit in a 3-digit number.
- ☐ I can count on and count back in steps of 1 and 10 from any number.



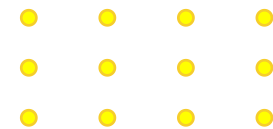
13 >

Look what I can do!

帮助学生总结反思本课所学

02.

新思维数学：学生用书



Check your progress

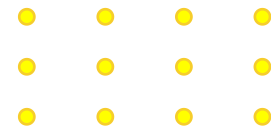
- 9 Sequences and functions
- 1 For each of these infinite sequences, work out:
- i the term-to-term rule ii the next two terms iii the 10th term
- a 6, 8, 10, 12, ... b 9, 15, 21, 27, ... c 28, 25, 22, 19, ...
- 2 Write down the first four terms of the sequence that has a first term of 5 and a term-to-term rule of: Multiply by 3 then subtract 5.
- 3 This sequence of patterns is made from squares.
- a Draw the next pattern in the sequence.
- b Copy and complete the table to show the number of squares in each pattern.
- | Pattern number | 1 | 2 | 3 | 4 | 5 |
|-------------------|---|----|---|---|---|
| Number of squares | 5 | 10 | | | |
- c Write down the term-to-term rule.
- d How many squares will there be in pattern 10?
- 4 Work out the n th term rules for both of these sequences.
- a 3, 6, 9, 12, 15, ... b 8, 9, 10, 11, 12, ...
- 5 For both sequences in Question 4, use your n th term rules to work out the 10th term.
- 6 Work out the first four terms of both of these sequences.
- a n th term = $5n$ b n th term = $n - 7$
- 7 Copy this function machine and work out the missing input and outputs.
- input output
- 1 → →
- 3 → →
- 12
- 8 Tarun draws this mapping diagram for a function.
- input 0 1 2 3 4 5 6 7 8 9 10
- output 0 1 2 3 4 5 6 7 8 9 10
- Copy and complete this function machine and table of values for the same function.
- | Input | | | |
|--------|--|--|--|
| Output | | | |
- input → → output

Check your progress

通过一系列问题测试学生对这一单元主要内容、核心概念和核心语言的掌握情况

02.

新思维数学：学生用书



9 Sequences and functions

> Project 4

Mole and goose

Shown is a section of a horizontal number line.

-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

A goose walks along the number line and stops sometimes to lay an egg.

She likes to space her eggs out equally. For example, she might lay her eggs at 2, 7, 12, 17, 22, ...

A mole digs a tunnel below the number line. It likes to dig up to the surface every so often, to see how far it has dug. It always pokes out its head at equally spaced intervals. For example, it might poke out its head at 1, 4, 7, 10, 13, ...

When the mole visits 7, it finds an egg there! Where else will the mole find an egg? Choose a starting number for each animal, and decide how far each animal will travel at each step of the sequence.



Does the mole find an egg? Does it find more than one egg?

Can you find some pairs of sequences in which the mole finds more than one egg?

How can you predict how far apart the mole finds the eggs?

Can you find some pairs of sequences in which the mole never finds an egg?

What is special about the size of the steps in these sequences?

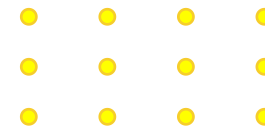


Project

让学生运用所学的知识和技能，
解决实际生活中的数学问题，或
者制作一些数学作品

02.

新思维数学：活动用书



1.1 Counting and sequences

Exercise 1.1

Focus

- 1 Hassan shaded in grey these numbers on a hundred square. The numbers form a pattern.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- a What is Hassan's rule for finding the next number?

- b What is the next number in his pattern?

- 2 The sequence 10, 16, 22, ... continues in the same way. Write the next two numbers in the sequence.
_____, _____

7 >

1 Numbers and the number system

- 3 The rule for a sequence of numbers is 'add 3' each time.
1, 4, 7, 10, 13, ...

The sequence continues in the same way.

Circle the numbers that are not in the sequence.

22 28 33 40

- 4 A sequence has the first term 2020 and the term-to-term rule is 'add 11'. Write the first five terms of the sequence.

- 5 Write the next four terms in these linear sequences.

a 10, 7, 4, _____, _____, _____, _____

b -9, -7, -5, _____, _____, _____, _____

c 1095, 1060, 1025, _____, _____, _____, _____

Tip

Remember that -9 is less than -7.



Practice

- 6 Here is part of a number sequence. The numbers increase by 25 each time.

25, 50, 75, 100, 125, ...

Circle all the numbers below that will be in the sequence.

355 750 835 900 995

8 >

1.1 Counting and sequences

- 7 Amy makes a number sequence. The first term of her sequence is 1. Her term-to-term rule is 'add 7'. Amy says, 'If I keep adding 7, I will reach 77.' Is Amy correct? Explain your answer.

- 8 Here is part of a number sequence. The first number is missing.

Write the missing number.

- 9 A sequence has first term 1001 and last term 1041.

The term-to-term rule is 'add 5'.

Write down all the terms in the sequence.

- 10 Each number in this sequence is double the previous number.

Write the missing numbers.

_____, 3, 6, 12, 24, 48, _____

Challenge

- 11 Write the missing number in this sequence. 1, 3, 6, 10, _____

Explain how you worked it out.

9 >

Focus: 掌握基本知识

Practice: 提升运用知识的自信心

Challenge: 引发深入思考

新思维科学、新思维数学

教师资源

章节内容
预估时间
内容资源

提问列表

数字资源列表

背景知识

> CAMBRIDGE PRIMARY MATHEMATICS 5: TEACHER'S RESOURCE

> 1 The number system

Unit plan

Topic	Approximate number of learning hours	Outline of learning content	Resources
1.1 Understanding place value	4 hours	Explain the value of a digit in a decimal (tenths and hundredths). Multiply and divide whole numbers by 1000. Multiply and divide decimals by 10 and 100. Compose, decompose and regroup numbers, including decimals (tenths and hundredths).	Learner's Book Section 1.1 Workbook Section 1.1 Additional teaching ideas for Section 1.1 Resource sheet 1A Resource sheet 1B Resource sheet 1C Resource sheet 1D
1.2 Rounding decimal numbers	3 hours	Round numbers with 1 decimal place to the nearest whole number.	Learner's Book Section 1.2 Workbook Section 1.2 Additional teaching ideas for Section 1.2 Resource sheet 1E Resource sheet 1F

Cross-unit resources

Diagnostic check and mark scheme
Digital Classroom: Unit 1 multimedia enhancement
Digital Classroom: Unit 1 activity
Worksheet 1A
Worksheet 1B
Language worksheet 1A
Language worksheet 1B
Learner's Book Check your progress
Unit 1 test and answers

30 >

1 THE NUMBER SYSTEM

Thinking and Working Mathematically questions in Unit 1

Questions	TWM characteristics covered
Learner's Book	
Exercise 1.1 question 8	TWM.07
Exercise 1.1 question 9	TWM.06
Exercise 1.2 question 5	TWM.04
Exercise 1.2 question 6	TWM.01
Check your progress question 8	TWM.01
Workbook	
Exercise 1.1 question 11	TWM.01
Exercise 1.1 question 13	TWM.01
Exercise 1.1 question 17	TWM.07
Exercise 1.2 question 2	TWM.02
Exercise 1.2 question 4	TWM.02
Exercise 1.2 question 10	TWM.02
Exercise 1.2 question 11	TWM.06

BACKGROUND KNOWLEDGE

We are surrounded by numbers in our everyday life. Some of these are whole numbers and some are decimals. Having a display of pictures in the classroom can help learners to see how numbers affect their lives.



In earlier stages, learners used place value charts to help them understand place value. In Stage 4, learners worked with whole numbers, reading and writing them correctly. Learners understood and explained how the value of each digit was determined by its position in a number.

31 >

新思维科学、新思维数学

教师资源

教学计划

CAMBRIDGE PRIMARY MATHEMATICS 5: TEACHER'S RESOURCE

1.1 Understanding place value

LEARNING PLAN		
Learning objectives	Learning intentions	Success criteria
5Np.01	Understand and explain the value of each digit in decimals (tenths and hundredths).	Learners explain the value of a digit in a decimal (tenths and hundredths).
5Np.02	Use knowledge of place value to multiply and divide numbers by 10, 100 and 1000.	Learners multiply and divide whole numbers by 1000.
5Np.03	Use knowledge of place value to multiply and divide decimals by 10 and 100.	Learners multiply and divide decimals by 10 and 100.
5Np.04	Compose, decompose and regroup numbers including decimals (tenths and hundredths).	Learners compose, decompose and regroup numbers.

LANGUAGE SUPPORT

The vocabulary related to decimals will be new for learners, so practise using it wherever possible. Insist that decimals are read correctly and learners understand their values, for example:

- 6.4 (read as six point four) means 6 ones and 4 tenths
- 6.40 (read as six point four zero) means 6 ones and 4 tenths and 0 hundredths
- 6.04 (read as six point zero four) means 6 ones and 0 tenths and 4 hundredths.

Sometimes there are differences in the vocabulary used internationally. Some key words have alternative versions, for example:

Used in this book	Alternative
ones	units
decompose	partition or write in expanded form
regroup	recombine

Compose: put together, for example, $600 + 30 + 2$ is 632.

Decimal: a number written in decimal notation, for example 34.5

Decimal place: the position of a digit to the right of the decimal point in a decimal number. The number 45.67 has two decimal places

Decimal point: the decimal point separates whole numbers from decimal places. You read 57.08 as 'fifty-seven point zero eight'.

T	O	t	h
5	7	0	8

Decompose: break down a number into parts, for example 456 is $400 + 50 + 6$
Hundredth: one part in one hundred equal parts; as a decimal it is written as 0.01

语言支持

1 THE NUMBER SYSTEM

CONTINUED

Place value: the value of a digit determined by its position. For example, in 830 the 3 has a value of 3 tens (30)

H	T	O
8	3	0

Regroup: to change the way a number is written. For example, $456 = 400 + 50 + 6$, but you can change this to $400 + 40 + 10 + 6$
Tenth: one part in ten equal parts. As a decimal it is written as 0.1

Common misconceptions

Misconception	How to identify	How to overcome
Learners may consider hundredths to be greater than tenths.	Through discussion and in written work.	Ensure that place value charts are used as visual prompts.
Learners may misunderstand the concept that multiplying or dividing by 10, 100 or 1000 moves the digits of a number 1, 2 or 3 places to the left or the right.	Through discussion and in written work.	Make sure learners understand that when a digit is moved to the left its value increases (ones become tens and so on) and when it is moved to the right its value decreases. When working with whole numbers, do not condone the use of a 'rule' involving 'add a zero' as this causes difficulties when working with decimal numbers and fractions. Calculators are a useful teaching resource to demonstrate patterns when multiplying and dividing by 10 and 100, as shown in the Multiplying and dividing whole numbers by 10, 100 and 1000 main teaching idea (in the Additional teaching ideas for this section).

Starter idea

Getting started (20 minutes)

Resources: Unit 1 Getting started exercise in the Learner's Book.

Description: Give learners 10 minutes to answer the Getting started questions in their exercise books. After 10 minutes, ask learners to swap their books with a partner and check their partner's answers as you discuss the questions as a class. After the class have marked their work, walk round and check if there are any questions that learners struggled with. You may

want to recap certain concepts as a class. Refer to the Background knowledge section at the start of this unit for suggestions of how to address gaps in learners' prior knowledge.

Main teaching idea

Place value (20–30 minutes)

Learning intention: Understand and explain the value of each digit in decimals (tenths and hundredths).

Resources: Resource sheet 1B.

迷思概念

教学思路

新思维科学、新思维数学

教师资源

课程活动



教学思路



家庭作业



练习指导



CAMBRIDGE PRIMARY MATHEMATICS 5: TEACHER'S RESOURCE

Description: Show a place-value chart. Tell the learners that it is like the one they used in Stage 4 but it has been extended to include decimal numbers.

100	200	300	400	500
10	20	30	40	50
1	2	3	4	5
0.1	0.2	0.3	0.4	0.5
0.01	0.02	0.03	0.04	0.05

Place numbers (up to 2 d.p.) on the grid and ask learners to say the numbers. Then reverse the process: say numbers (up to 2 d.p.) and ask learners to place the numbers on the grid.

Shade cells in the displayed chart to make numbers with 2 decimal places, for example shade 6, 0.5 and 0.01 to make 6.51.

H	T	O	t	h
		6	5	

Ask:

- How do you say this number?

Answer: 6.51 is six point five one

How do you decompose this number?

Answer: $6 + 0.5 + 0.01$

- Can you regroup this number in a different way?

Answer: $5 + 1.5 + 0.01$, other answers are possible.

- How do you say the number equivalent to 6 ones + 5 tenths + 1 hundredth? Remind learners that when they combine numbers in this way, they are composing a number.

Answer: 6.51

Repeat for other numbers and also ask questions about specific place values:

- What is the value of the digit 4 in the number 6.48?

Answer: 4 tenths or $\frac{4}{10}$

- What is the value of the digit 6 in the number 4.06?

Answer: 6 hundredths or $\frac{6}{100}$

Ask learners to work in pairs on the activity in Resource sheet 1B. Make sure they say the numbers as instructed.

1 THE NUMBER SYSTEM

Now ask learners to complete questions 1 to 4 of Exercise 1.1 in the Learner's Book.

> Differentiation ideas: Support less confident learners by pairing them with a more confident learner who is willing to help them. Ask more confident learners to make sets of three cards offering different ways of decomposing and regrouping decimals, for example:

5.39	$5 + 0.3 + 0.09$	$4 + 1.3 + 0.09$
------	------------------	------------------

Plenary idea

Target board (10 minutes)

Resource: Copy of target board.

Description: Display the target board and ask questions related to it, for example:

- Which number is the result of dividing 409 by 100?

Answer: 4.09

- What is 18 divided by 10?

Answer: 1.8

3.06	2.13	5	3.45	5.18
3.34	3.24	3.3	2.5	4
3	3.1	1.69	3.29	4.79
4.09	3.5	4.9	2	1.8

Insist that learners say the decimals correctly (e.g. 3.06 is 'three point zero six').

Guidance on selected Thinking and Working Mathematically questions

Learner's Book Exercise 1.1, question 9

Learners are given four statements, each with a missing number, and have to work out which is the odd one out. You may need to remind learners that they need to calculate and then compare the missing numbers in order to identify the odd one out.

Learners will show they are **classifying (TWM.06)** when they calculate the missing numbers and notice that three of them are the same, leaving the fourth as the odd one out.

CROSS-CURRICULAR LINKS

Work on the history of measurement will include reference to the metric system. The metric system is an internationally recognised decimalised system of measurement, for example lengths can be measured in millimetres (mm) and centimetres (cm). There are 10 mm in a cm so $1.4 \text{ cm} = 14 \text{ mm}$.

Learners will use metric measurements in science, for example when working on evaporation they may measure air temperatures in Celsius and the depth of water in a pond in millimetres or centimetres, and understand that $10 \text{ mm} = 1 \text{ cm}$.

Homework ideas

- Learners design a poster that shows how to multiply and divide by 10, 100 and 1000. They can illustrate it with examples, including drawings, pictures or photographs. For example:
 - 1 metre is 100 times as long as 1 centimetre
 - 1 cent is 100 times smaller than 1 dollar.
- Learners write questions and answers based on the target board used in the Target board plenary idea.

新思维科学、新思维数学

课时安排



建议一周2~3个课时



建议一周3~4个课时



新思维科学、新思维数学

支持体系

全国研讨会

区域研讨

国家级课题

联合教研

教材使用培训

校际交流研讨

教师培训

个性化合作

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计划出版时间

产品组成	新思维科学	新思维数学	计划出版时间
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活动用书	9种	9种	2022.08
教师用书	9种	9种	2023.07

