

Rising Stars Mathematics and the NCETM Textbook Guidance



In January 2015, the NCETM provided guidance on the philosophy, structure and features of high-quality textbook programmes, to help schools make a quality choice when investing in resources for the new curriculum.

























Over the following pages you will learn how *Rising Stars Mathematics* not only supports but has been written specifically to meet this criteria.



1

A good textbook scheme should...

be a comprehensive learning tool that includes resources for use in lessons and independently

YEAR GROUP	TEACHER'S GUIDES	PUPIL TEXTBOOKS	PRACTICE BOOKS	DIGITAL RESOURCES
Year 1				 eTextbooks with animations
Year 2				 Digital versions of the Teacher's Guides
Year 3				 Subject knowledge videos for every unit
Year 4				 Introductory presentations for staff meetings
Year 5				 Online CPD modules
Year 6				 Whiteboard Modelling Toolkit

The Rising Stars Mathematics Textbooks are designed for use as a teaching tool in class.

The Rising Stars Mathematics Practice Books offer opportunities for independent practice.

The Rising Stars Mathematics Teacher Guides provide detailed notes so teachers can teach in the way that best suits their own class.

2

A good textbook scheme should... provide subject knowledge and pedagogy support to teachers

Rising Stars Mathematics offers:



2-3 minute subject knowledge videos for each unit

INSET training presentations for staff meetings



Online CPD courses for teachers and TAs

Background knowledge sections in the Teacher's Guide support teaching using each Textbook page

1a One more one less

Count forwards and backwards to 30, 10s and to 50 in tens

- Read on more and one less for numbers up to 30

Mathematical vocabulary

One more, the next counting number, one less, the counting number before, twenty, forty

Representations and resources

- 20 cubes
- Number line or number track
- 100 squares (or the first 20 x 5 sheet)
- Counters, cubes and other small counting objects
- Place value cards

Warming up

Count to 20 in tens using a 10s number line or number line for support. Count forwards and backwards from several tens in a range of sizes, for example 20 to 10 and so on to make it memorable.

Background knowledge

Children will already have a great deal of experience of counting. In the Foundation Stage, they are likely to have counted to at least 20, even if they cannot remember the correct order of the numbers without support. At this early stage, they may not have noticed any number patterns.

In early number systems, very straightforward numbers 0 to 10 are being repeated, one and one again and in the same order. Children can use this pattern to help them to extend that counting range and to understand what tens and one less mean. They are using items along a number line so that they can see how many 'one' or 'two' single units they have to add to get to the next number. They are asked to help them to recognise that the order of the numbers is always the same, no matter where that sequence is shown. This recognition helps children to understand that 1 more is the next counting number and 1 less is the counting number before.

None of this should happen in isolation. It is important that children experience concrete objects, pictures of those objects and then the abstract recording of how many through writing a number. This Concrete-Pictorial-Abstract route will need to be repeated along many times as 1 adds as 1 takes as they develop their number.

Let's learn: Modelling and teaching

Counting in ones/tens

Using the first three rows of a 100 square, as in the Textbook, explore the pattern in the numbers. Make sure the children recognise that the numbers 1 to 10 occur on each row and that there are ten units in the end of the first row. First, use the numbers beyond 10 to make, one ten and one unit, one ten and two units, one ten and three units and so on. Place value cards are useful to show the children that the number one unit builds tens and ones. Practice counting in tens meaning down the numbers at the end of each row in the 100 square. Count to 10 only.

More and less

Explore the number 1 to 3 pattern repeats itself again and again, we can use it to help us find out that one more is 1. Count some objects heads and to tell you which number comes next. Repeat with other amounts of objects, then repeat without objects, naming a count and asking the children to tell you 1 more. Make sure the children understand that 1 more is simply the next counting number and they can check on a number line or number track, looking at numbers on a ruler a also ideal for this type of activity.

Before the activity, asking children to explain what is wrong with twenty-ten. Encourage them to explain in their own words that 1 more than 20 is 19.

When the children are confident with 1 more, use the same strategy to illustrate 1 less. This time talk about removing one object, so that you have 1 less. Focus on using the 1st pattern and the previous counting number to predict the number that is 1 less.

Let's practise: Digging deeper

Step 1

As the teacher, children need to demonstrate what the concept of 'one more' actually means. They will be copying the pictures and drawing 1 more or 1 less. Demonstrating one to one correspondence. Some children will need physical objects to do this with, so the illustrations deliberately include standard classroom resources, though any resources will be replaced with another. Children need to experience this concrete phase before moving to the pictorial stage, as whenever possible, encourage the use of counting objects. Many children will count the objects on the page to find out how many to draw. At this stage, we are not asking them to label their pictures with numbers, though they can if they wish.

Step 2

In this section, children are being asked to write 1 more or 1 less than a particular number. To do this, children will need pictorial representations of what is 20 or some other number. Some children may need concrete objects to help them find the given number before writing the relevant number. Others will have internalised the pattern of the numbers and be able to write the number.

Let's practise

Draw 1 more. Draw 1 less.

Write 1 more. Write 1 less.

Count some objects.

Think: How many more or less than 10 can you draw? How many more or less than 10 can you draw? How many more or less than 10 can you draw?

Follow-up ideas

- In a large open area, label a variety of objects, boxes and containers with consecutive numbers. Progress some cards which say either 1 more or 1 less. Children choose a bag or container, then take out 1. They use these to fill the bag/box with many of whatever they wish. That's 1 more or 1 less than say on the bag, box or container.
- Using a range of toys such as cars, people, bricks and so on, set up some place situations. Begin by asking the child to count the objects, then give them 1 more and ask them to tell you how many more that they have 1 more and then how many they have taken 1 away and ask the children to tell you what 1 less is.
- Using a range of toys such as cars, people, bricks and so on, set up some place situations. Move an object from one container to another, so

3

A good textbook scheme should...

have coherent and connected content in carefully organised sections with related concepts presented together

In *Rising Stars Mathematics*, each year follows a clear learning sequence of 14 units where key points are drawn together to make connections.

Each unit will take 2 to 3 weeks to teach depending on your class.



Year 2 Contents Scope and Sequence

Unit	Theme	Suggested Timing	Concept number	Mathematical focus (PoS domain)	Concept title
1	Number sense	2-3 weeks	1a	Number - number and place value	How many?
			1b	Number - number and place value	More and less
			1c	Measurement and Statistics	Tallest, longest, shortest, Measuring height and length
2	Additive reasoning	2-3 weeks	1d	Measurement (Time)	Before and after
			2a	Number - addition and subtraction	Fact Families
			2b	Number - addition and subtraction, Measurement (money), statistics	Adders
3	Geometric reasoning	2-3 weeks	2c	Number - addition and subtraction	Adding 3 numbers
			3a	Geometry - properties of shape; Geometry - position and direction	Patterns
			3b	Geometry - properties of shape; Geometry - position and direction; statistics	Symmetry
4	Number sense	2-3 weeks	3c	Geometry - properties of shape; statistics	Quadrilaterals
			3d	Geometry - properties of shape; statistics	Quadrilateral faces
			4a	Number - number and place value	Ordering Numbers
5	Additive reasoning	2-3 weeks	4b	Measurement (Weight and capacity)	How much? - weight and capacity
			4c	Measurement (Time)	Quarter past and quarter to
			5a	Number - addition and subtraction	Number Bonds
6	Number sense	2-3 weeks	5b	Measure (Money), statistics	Shopping
			6a	Number - number and place value	Estimating
			6b	Number - multiplication and division; statistics	Odd and even
7	Multiplicative reasoning	2-3 weeks	6c	Statistics	Statistics
			7a	Number - multiplication and division; statistics	Times tables (2, 5 and 10)
			7b	Number - multiplication and division	Problem solving with times tables
8	Number sense	2-3 weeks	7c	Measurement (Money)	Money
			7d	Measurement (Time)	Tell the time to 5 minutes
			8a	Number - number and place value	Splitting numbers in different ways
9	Additive reasoning	2-3 weeks	8b	Number	Doubles
			8c	Number - fractions	Fractions of a whole
			8d	Measurement (length and temperature); Statistics	Height and temperature
10	Geometric reasoning	2-3 weeks	8e	Measurement (weight)	Weight and capacity
			9a	Measurement (money)	More money
			9b	Measurement (money)	Subtraction
11	Number sense	2-3 weeks	9c	Number - addition and subtraction	Subtraction
			10a	Geometry - properties of shape; Geometry - position and direction	Shape faces
			10b	Geometry - properties of shape; Geometry - position and direction	Patterns and paths
12	Additive reasoning	2-3 weeks	10c	Measurement (capacity and temperature); statistics	Weather
			11a	Measurement (capacity and temperature); statistics	Our school day
			11b	Measurement (Time)	Fractions of time and shape
13	Additive reasoning	2-3 weeks	11c	Number - fractions	Check for addition
			12a	Number - addition and subtraction	Check for addition
14	Additive reasoning	2-3 weeks	12b	Number - addition and subtraction	Checking addition

RISING STARS

DRAFT CONTENTS MAY CHANGE

PAGE 2 of 12

Making connections

- Counting forward and back is a good way to get to know the order of the numbers. We use the same numbers, in the same order, when measuring and in dates. Children will begin to recognise that the number system works in the same way when we use those numbers to count, compare and order, whatever it is we are exploring.
- Ten is a fundamental building block to our number system and children use tens and ones to build any number. Hundreds, and beyond will be added to the children's toolbox later.
- Using a week wheel with a pointer will help the children to see the cyclical nature of a week. We can also number the days and explore the date to recognise another use of numbers.

Making connections sections in the *Teacher's Guides* identify related concepts


Visit www.risingstars-uk.com/rsmathematics for a full contents list.

5

A good textbook scheme should...
provide opportunities to develop procedural fluency and
conceptual understanding




Let's practise




1 Find bonds to 10.
Show a number on a 10 frame.
Look at the empty squares.
Write the number bond.
Try again.



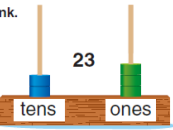
$4 + 6 = 10$

2 Copy and complete.

a  c  e 

b  d  f 

3 Think.




There are 2 rings on the tens spike and 3 rings on the ones spike.
10...20...21...22...23!
What numbers can you make with 5 rings?


Teacher's Guide See page 7 of the Teacher's Guide for ideas of how to guide practice. Work through each step together as a class to develop children's conceptual understanding.


1b Tens and ones


1 Colour the counters to show each number. Complete the number bond for 10.


$2 + 8 = 10$


a  $6 + \square = 10$


b  $1 + \square = 10$


c  $8 + \square = 10$

d  $4 + \square = 10$



e  $5 + \square = 10$



f  $7 + \square = 10$



g  $9 + \square = 10$



h  $3 + \square = 10$



2 Write the numbers shown by these.



a  10  6 16

b  20  3 \square


c  20  7 \square


d  20  5 \square


e  30  1 \square


f  30  6 \square


3 Complete these.


a  28

b  32


c  45

d  39


e  \square


f  40


Write the number each shows.




26

a  \square

b  \square

c  \square

d  \square

The *Rising Stars Mathematics Textbooks* use variations, presenting the same idea in slightly different ways with small steps of progression which draw attention to the mathematical relationships.

The *Practice Books* provide intelligent practice through carefully chosen examples which deepen understanding while developing fluency.

A good textbook scheme should... reflect the principles underpinning teaching with variation

1b Tens and ones

Let's learn

Ten

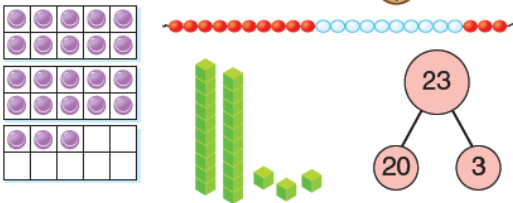
10 is a very important number in our number system.



Show 7 on a 10 frame. How many empty squares are there?

Place value

2-digit numbers are made of tens and ones. Look how to show 23.



Choose a number. How can you show it?

You need:

- 10 frames
- counters
- place-value cards or counters

23 is two ones and three tens.

That's the wrong way round. 23 is twenty and three. That's two tens for the twenty and three ones.

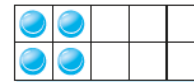


Let's practise

1

Find bonds to 10.

Show a number on a 10 frame. Look at the empty squares. Write the number bond. Try again.



$$4 + 6 = 10$$

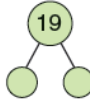
2

Complete the place-value circles.

a



c



e



b



d

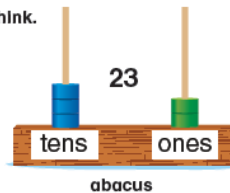


f



3

Think.



abacus

There are 2 rings on the tens spike and 3 rings on the ones spike.

10...20...21...22...23! 23!

What numbers can you make with 5 rings?



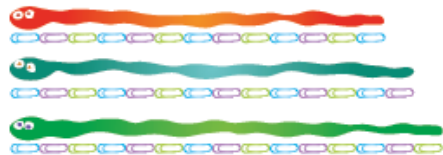
The *Rising Stars Mathematics Textbooks* contain carefully chosen examples to deepen understanding, building up in small steps and moving from using concrete resources, through pictorial to abstract or symbolic representations.

A good textbook scheme should...
provide frequent opportunities for intelligent practice

3

Count and compare.

a How long is the shortest snake?



b How tall is the shortest pencil?



c How many beads on the longer string?



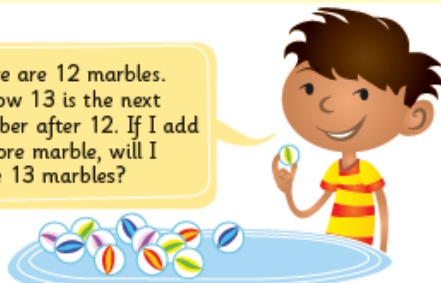
In *Rising Stars Mathematics*, the *Textbooks* and *Practice Books* progress from bare practice, through to contextualised practice requiring reasoning to open-ended investigations which deepen understanding and develop fluency.

4

Think.

Is 1 more always, sometimes or never the next counting number?
How do you know?

There are 12 marbles.
I know 13 is the next
number after 12. If I add
1 more marble, will I
have 13 marbles?



3

Write 1 more.

a

2	→	<input type="text"/>
12	→	<input type="text"/>
22	→	<input type="text"/>
32	→	<input type="text"/>

b

7	→	<input type="text"/>
17	→	<input type="text"/>
27	→	<input type="text"/>
37	→	<input type="text"/>

4

Write 1 less.

a

4	→	<input type="text"/>
14	→	<input type="text"/>
24	→	<input type="text"/>
34	→	<input type="text"/>

b

9	→	<input type="text"/>
19	→	<input type="text"/>
29	→	<input type="text"/>
39	→	<input type="text"/>

5

Colour your answers on the 100 square. What do you notice?

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 good textbook scheme should...

show the relevance of mathematical ideas and how they are used to solve problems

Engaging and exploring

Ask the children to tell you their house or flat number. Explain that one of the photos in the textbook is of house number 27. Does anyone in the class have 27 on their door? Or a number with a 2 or a 7 in it? Ask the children if they can see a 2 or a 7 in the classroom. Give them some time to look at the photos in the textbook and discuss what they notice with a partner before sharing ideas with the class. You could extend this further by asking them to discuss where they have seen numbers in their own daily lives.

There are several photos showing 5, or 5 of something, to engage the children, since most of them will be 5 years old. Ask children to find the photo of the birthday card. Can they tell you how old they are now? What about how old they were on their last birthday? How old will they be on their next birthday? Can they find a photo that shows a date? Relate to their birthdates. You could then move onto to

other important dates, e.g. the date today/tomorrow.

Other numbers shown relate to common experiences. Discuss what numbers are used for, for example: to show how many (or how much) of something; age in years; days in the month so far. Explain, if necessary, that they are also used to measure (e.g. the length of pencil, as a number of centimetres); to label (e.g. a bus route or telephone number); and to order (e.g. door numbers and dates).

Ensure that the children recognise that numbers are used in different ways and can mean different things in different situations. Encourage them to find examples of numbers throughout the day and consider how they are being used.

Unit 1

Numbers everywhere!



What else do I have 10 of?

9 is a special number. That's the bus I catch to go to see granddad.



What's the day before Friday?



I wonder where number 28 is?



5 is a special number. I'm 5!



5 is a special number. I'm 5!

I wonder if she is still the tallest?



Each unit in *Rising Stars Mathematics* begins with images of mathematics in real-life with question prompts to promote discussion and reasoning.

Look at the pictures with the children and ask the questions. See pages 10-12 of the Teacher's Guide for key ideas to draw out.

A good textbook scheme should...

make explicit reference to mistakes and misconceptions and use of non-examples

I think this is a regular hexagon because the sides are all the same length.




I don't think so because in a **regular** hexagon, I think the sides **and** the angles need to be the same.

Concept cartoons
in the *Rising Stars
Mathematics
Textbooks* expose
common
misunderstandings.





23 is two ones and three tens.


That's the wrong way round. 23 is twenty and three. That's two tens for the twenty and three ones.

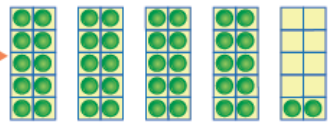



3 Look at the numbers and pictures. What's wrong?
Change the number or the picture to make them match.

You need:

- Base 10 apparatus 
- place-value cards (1-40) 
- counters 
- 10 frames 

4 1 

2 4 

3 7 

The pupil materials include practice activities and assessment tasks that ask children to identify what's wrong and correct mistakes.

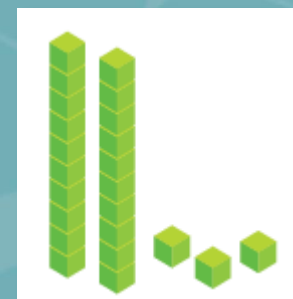
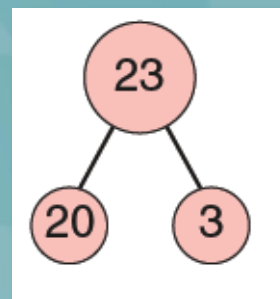
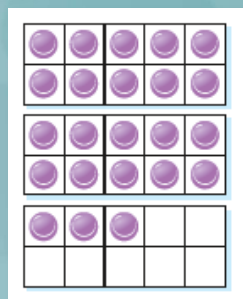
A good textbook scheme should...

use representations that provide insight; not illustrations merely for decoration

count in ones





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

count in tens



Rising Stars Mathematics Textbooks include a variety of mathematical representations, models and images which all have a clear purpose to enhance learning.

You need:

- Base 10 apparatus 
- place-value cards (1-40) 
- counters 
- 10 frames 

The use of concrete practical resources at all years to aid conceptual understanding is encouraged throughout.

12

A good textbook scheme should...

provide supporting online resources that mirror the textbook structure and digital software that enhances the focus of learning



The *Rising Stars Mathematics Teacher Toolkit* provides software that can be used to model and explore concepts on the interactive whiteboard.

In the supporting website the resources are all organised unit by unit to match the structure of the *Textbook and Teacher's Guides*.



The *Rising Stars Mathematics eTextbooks* are enhanced with animations to explain concepts.



The online CPD videos support the guidance in the *Teacher's Guide* introduction in a bite-size, easy-to-access, quick 2-3 minute format.



A good textbook scheme should...

provide practice that can be used out of school to help develop conceptual understanding and fluency

1a One more and one less Year 1 Unit 1
Homework 1

- Flick a coin onto the number grid and see what number it lands on. Say the number, then write it.
- Find the numbers that are one more and one less than your number. Use the number grid to help you.
- Repeat at least 6 times. Look at the numbers you have written.
- Are there any patterns? Can you explain them?
- Could you work out one more than a number that is not on the grid? How?

You need:

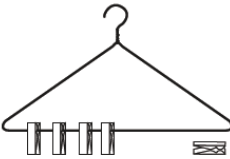
- 5p coin (or counter)
- pencil and paper
- a partner

One less	Your number	One more
16	17	18

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

Please help your child by reading the instructions and doing the activity together. Rising Stars Mathematics Year 1 © Rising Stars UK Ltd 2015

1a Add one, subtract one Year 1 Unit 1
Homework 2




You need:

- a coat hanger
- some clothes pegs
- 1–6 dice

- Start with an empty coat hanger and a pile of clothes pegs. Roll the dice and put that number of pegs onto the hanger, e.g. 4.
- Put one more peg onto the hanger. How many do you have now? Write an addition to show this, e.g. $4 + 1 = 5$.
- Roll the dice again and repeat. How many different additions are possible?
- Play again, but this time take one peg away to find one less. How many different subtractions are possible?
- Talk about any patterns you have made.

Please help your child by reading the instructions and doing the activity together. Rising Stars Mathematics Year 1 © Rising Stars UK Ltd 2015

1b Make 10 Year 1 Unit 1
Homework 3




You need:

- 10 counters (or 5p coins)
- number cards 0–10 (or pencil and paper to make a set)
- a partner


- Place the number cards face down.
- Player 1 turns over a number card, e.g. 4, and puts that many counters on the 10 frame.
- Player 2 works out how many more counters are needed to make 10, e.g. 6, and fills the 10 frame.
- Together, record the number statement, e.g. $4 + 6 = 10$.
- The player who placed the larger number of counters wins that round and scores 10 points.
- Play until one player has 100 points.

Are there any rounds that end in a draw? Explain why.



Please help your child by reading the instructions and doing the activity together. Rising Stars Mathematics Year 1 © Rising Stars UK Ltd 2015

1b 10p and 1p coins Year 1 Unit 1
Homework 4




You need:

- Three 10p coins
- Three 1p coins
- Pencil and paper

- Collect three 10p coins and three 1p coins.
- Explore how many different money amounts you can make using the coins. You can use only one, two, three, four, five or all six coins to make an amount.
- Write a list of the different amounts you make.
- Can you see any number patterns? Try to explain what you can see to someone.

Why can't you make 4p, 14p, 24p or 34p?



Please help your child by reading the instructions and doing the activity together. Rising Stars Mathematics Year 1 © Rising Stars UK Ltd 2015

The *Rising Stars Mathematics Teacher's Guides* contain *Homework Sheets* which provide photocopyable expansion activities for children to do outside the classroom and engage parents at home.

Rising Stars Mathematics Practice Books and games from the *Textbooks* can also be used at home.

A good textbook scheme should...

provide formative and summative assessments to measure progress and inform future learning; not merely a collection of more questions to practise

Assessment task 1

Resources

Cardboard box turned into a function machine, blank labels, number cards (2–49).

Running the task

If necessary, demonstrate the function machine using a box. Check that children understand the task and give them plenty of time to explore. After choosing five number cards to use and record what happens, change the label to 1 less. Some children may need the support of a number line, showing that they have not yet mastered the concept.


Can the children think of other ways to use the function machine? They could feed in single-digit numbers and the function machine gives the number bond to 10, or something else. Alternatively, children could cover the rule written on the function machine, pass a number through the machine and use what comes out to help them explain what the label on the function machine must be.

Evidencing mastery

Here, evidence of mastery is particularly clear when children can generalise. Recognising that one more is simply the next counting number, so that the children can put any number into the machine and know what will come out is evidence of mastery. For one less, generalising and explaining that the number coming out of the function machine is the previous counting number is evidence of mastery. Some children may need to count from zero to find the number before, even though they can say the number which is one more. Mastery of one less may well lag behind that for the concept one more. Further practice may be needed. Being able to say what the label on the function machine must be according to what happens to a number is further evidence of mastery.

Review 1 And finally ...

Let's review




You need

- number cards (2–49) 2, 19

Pick 5 number cards and put them in the function machine. Find 1 more for each number. Set the function machine to '1 less'. Put the same numbers in. What do you get now? What do you notice?

2 Roll two dice. Make two 2-digit numbers.



You need

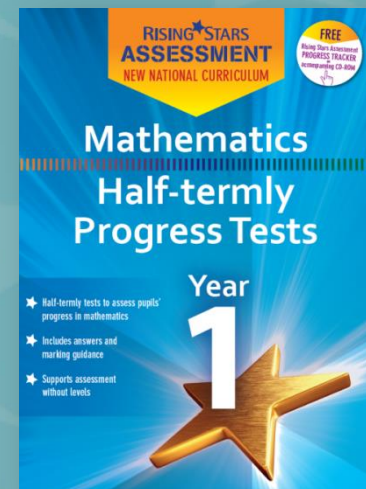
- two 1–6 dice
- different kinds of base 10 apparatus

Draw or make each number.

What is the largest number you can make? What is the smallest?

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Mathematics Half-Termly Progress Tests can be used alongside *Rising Stars Mathematics* to provide summative assessment.



The formative assessment tasks in the *Rising Stars Mathematics Textbooks* provide activities that teachers can observe to identify which children have mastered concepts and which need further support.

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A good textbook scheme should...

be written by authors with expert knowledge and accrued professional experience, who draw on research evidence

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The author team includes:

- Caroline Clissold – highly experienced primary school teacher, mathematics adviser and trainer
- Cherri Moseley – active member of the Mathematical Association and member of the Joint ATM/MA Primary Group
- Paul Broadbent – independent maths consultant with over 30 years in primary education as a teacher, deputy head, teacher trainer and advisor
- Emma Low – experienced primary school teacher and local authority consultant
- Linda Glithro – primary specialist, ex teacher, deputy head and head teacher
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