Maths at Bures

A School Presentation to Parents

Information and Guidance on the Expectations for 2023

What do lessons at Bures look like?

- Daily mental maths to practice number bonds, times tables and arithmetic:
  - Numberblocks and NCETM Mastering Number in Reception;
  - NCETM Mastering Number in Year 1 and Year 2;
  - Multiplication practice through daily quizzing in Year 3 and 4;
  - Timed arithmetic quizzes in Year 5 and 6.

- Daily Mastery maths lessons which include fluency, problem solving and reasoning;

- Not moving on until children have secured concept;

- Lessons in 'ping-pong' style to keep children together to allow for assessment and regrouping or pre/post-teaching;

- Use of extension tasks to offer a greater level of challenge during the independent parts of the lesson.

Maths Teaching at Bures Primary

- As a school we use a ‘Mastery’ approach to Mathematics underpinned by The White Rose Maths schemes from Reception to Year 6 to support a consistent approach. Mastery is defined by the NCETM (National Centre for the Excellence of Teaching in Mathematics) as an approach in which:

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics.

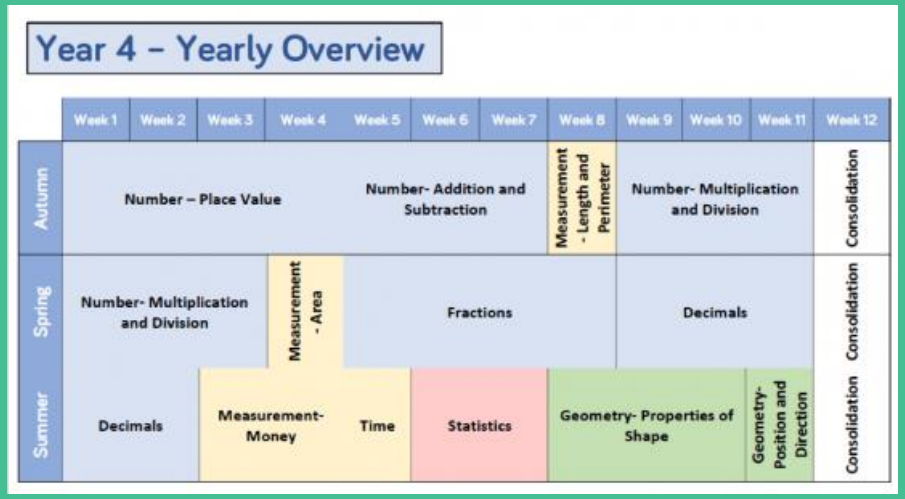
- The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.

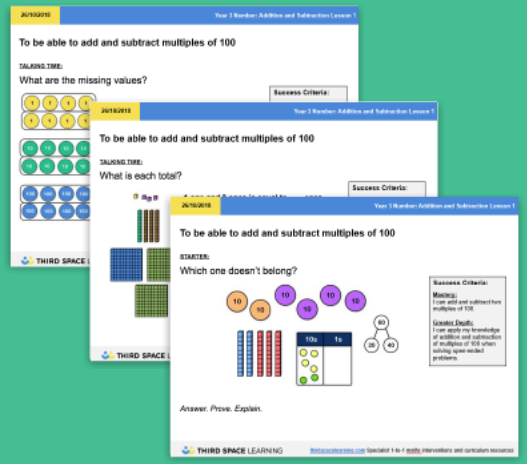
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.

- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

Planning for mastery

Many schools now follow White Rose ‘small steps’ and the NCETM Teaching for Mastery materials.



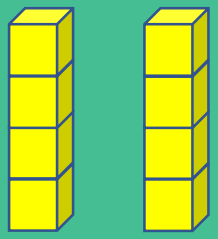


Year 1 to Year 6 slides available from mathshub.thirdspacelearning.com

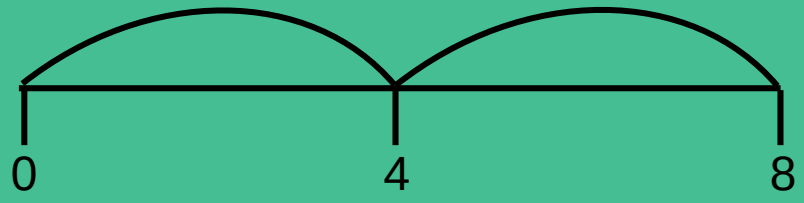
Mastering mathematical understanding

The CPA approach

- Concrete – the ‘doing phase’



- Picture – the ‘seeing phase’



- Abstract – the ‘symbolic phase’

$4 + 4 = 8$

$4 \times 2 = 8$

Fluency

One of the National Curriculum aims

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematical procedures

Intelligent practice:

If they know: 2 × 3 =

They also know: 20 x 3 = 2 x 30

20 x 30 = 2 x 300 = 200 x 3

10,800 divided by 12 = 900

Those children that are secure with place value and times tables do not need to calculate this as they use know facts.

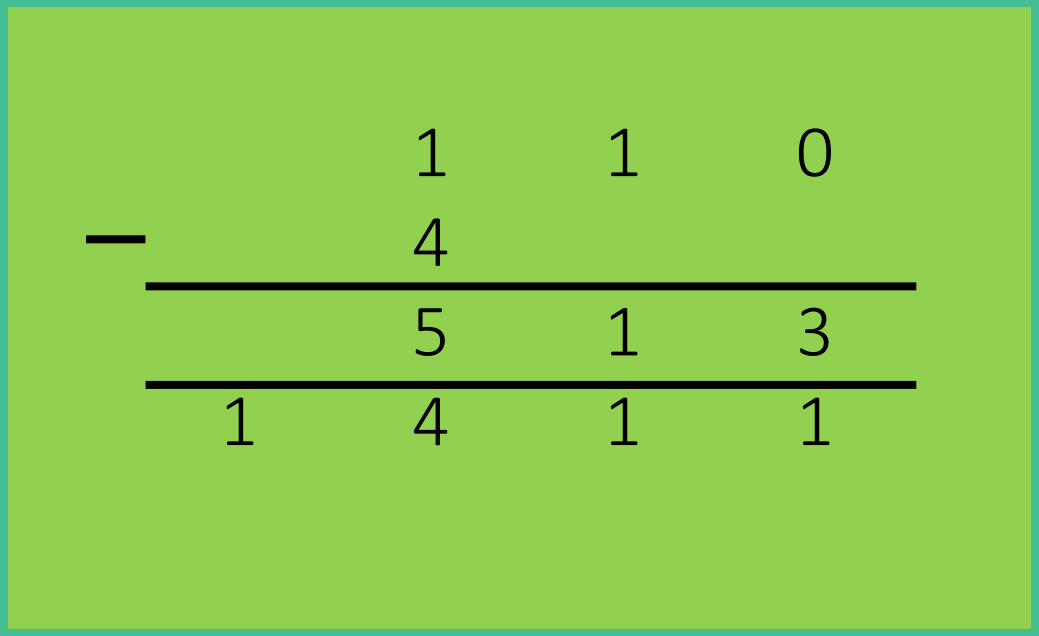
12 x 9 or 9 x 12 = **108**

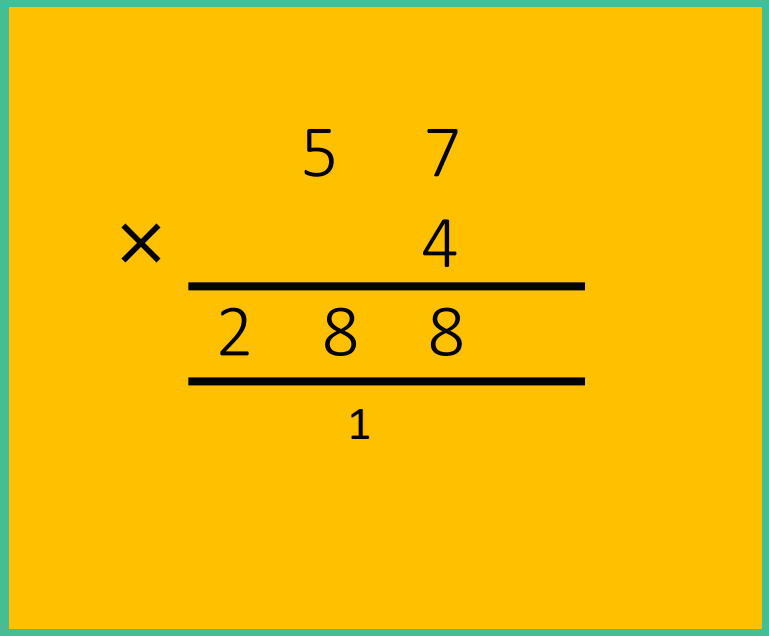
10,8**00** is one hundred times larger than 108 so the answer will be one hundred times larger than 12 x 9 or 9 x 12.

Fluency

Procedural fluency

Misconceptions: what is happening here?



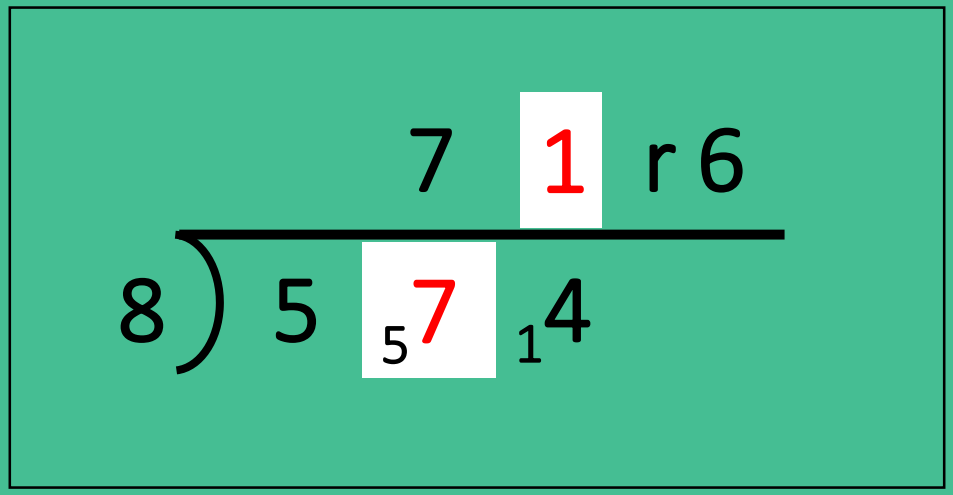


A solid understanding of place value is the key to success in laying out and using formal methods.

Mathematical procedures

What is missing and why?

Can you clearly explain your reasoning?

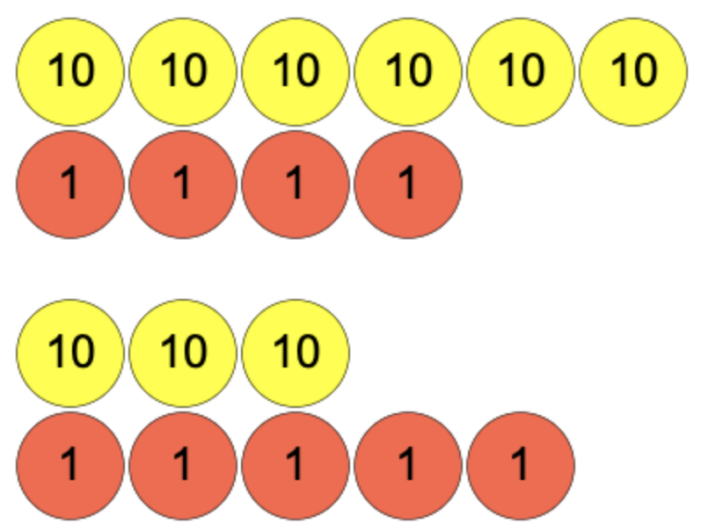


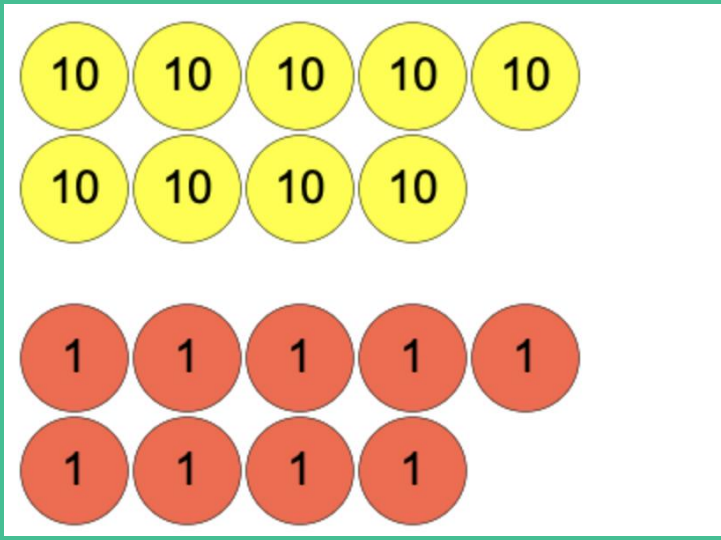
Key Stage 1

Addition

Collecting things that are the same

64 + 35





Year 4 – mastery level

Mia

Mohammed

Aiden

Mia is 128cm tall.

Aiden is 1.36m tall.

Mohammed's height is midway between Mia's and Aiden's. How tall is Mohammed?

Maths Teaching at Bures Primary

- The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – 'mastery' – in mathematics, rather than many failing to develop the maths skills they need for the future.

- Here is an example of Mastery in action in Year 2:

- https://www.youtube.com/watch?v=HGk8F6rRpPg&list=PLQqF8sn28L9wATWksCfMEIe19I7JRasuZ&index=27

- Adding fractions Year 3
- https://vimeo.com/83486226

- Division in Year 4
- https://vimeo.com/83485805

- As you can see, the focus is on conceptual understanding and not on procedural methods.

Assessment and Reporting

- In Reception, the Early Learning Goals have been updated under the New EYFS framework for maths with an emphasis on number. This means there is less emphasis on understanding about shape, space and measure e.g names and properties of shapes, measurement of length and weight. Greater emphasis has been placed on children's understanding of subitising and composition of numbers up to and including 10. The children are assessed through observation of their learning in both independent tasks, play and teacher-led tasks.

- Under the 2014 National Curriculum, children are now described as working towards, working at and working at greater depth according to expectations of their year group in the new curriculum. At Bures we use tests to assess this content together with teacher assessment of learning in class. As previously mentioned, in Year 2 and 6 this continues to be assessed through statutory testing.

In Year 4 the children will take part in the statutory Multiplication Table Check during the month of June. At present, these results are not reported but it is clear that those children that can recall their times tables are more successful in the KS2 SATs tests.

- The new curriculum is more rigorous and sets higher expectations of pupils to show their understanding.

Number bonds and tables

- Those children that are fluent in recalling their number bonds and times tables find the transition to formal methods easier and develop a greater conceptual understanding so….
- If you are going to do anything to support maths, work on these. Our new maths fluency initiatives will fully support this too so please help your child practice their Dragon, Rainbow or Solar maths targets with you…

Key Stage 1 and 2 National Curriculum Assessments

- In 2014, a new national curriculum framework was introduced by the Government for Years 1, 3, 4 and 5. However, Years 2 and 6 (due to statutory testing) continued to study the previous curriculum for one further year.

- However, in 2015/2016, children in Year 2 and Year 6 were also expected to study the new national curriculum.

- In the summer of 2016, KS1 (Year 2) and KS2 SATs (Year 6) reflected the new curriculum for the first time.

- At present KS1 are required to undertake yearly SATs until September 2023 when they will become non-statutory. In KS2 there will continue to be yearly tests. At the moment KS1 tests are marked internally in the school and form part of the teacher judgement for pupil outcomes at the end of Year 2.

- In KS2 tests are externally marked and judgements for pupil outcomes are based purely on the basis of the test results in all areas except writing. Therefore in maths, teacher judgements for KS2 are not taken into consideration.

Mathematics in KS1

In KS1 Children will sit two tests: **Paper 1 and Paper 2:**

- **Paper 1: Arithmetic** - lasts approximately 20 minutes (but this is not strictly timed). It covers calculation methods for all operations.

- **Paper 2: Reasoning** - lasts for approximately 35 minutes, which includes time for five aural questions. Pupils will still require calculation skills and questions will be varied including multiple choice, matching, true/false, completing a chart or table or drawing a shape. Some questions will also require children to show or explain their working out.

Mathematics in KS1

In KS1 if children progress too quickly onto formal methods, they do not have the time to secure their conceptual understanding so they only know how to answer a question using a process. A common misconception is:

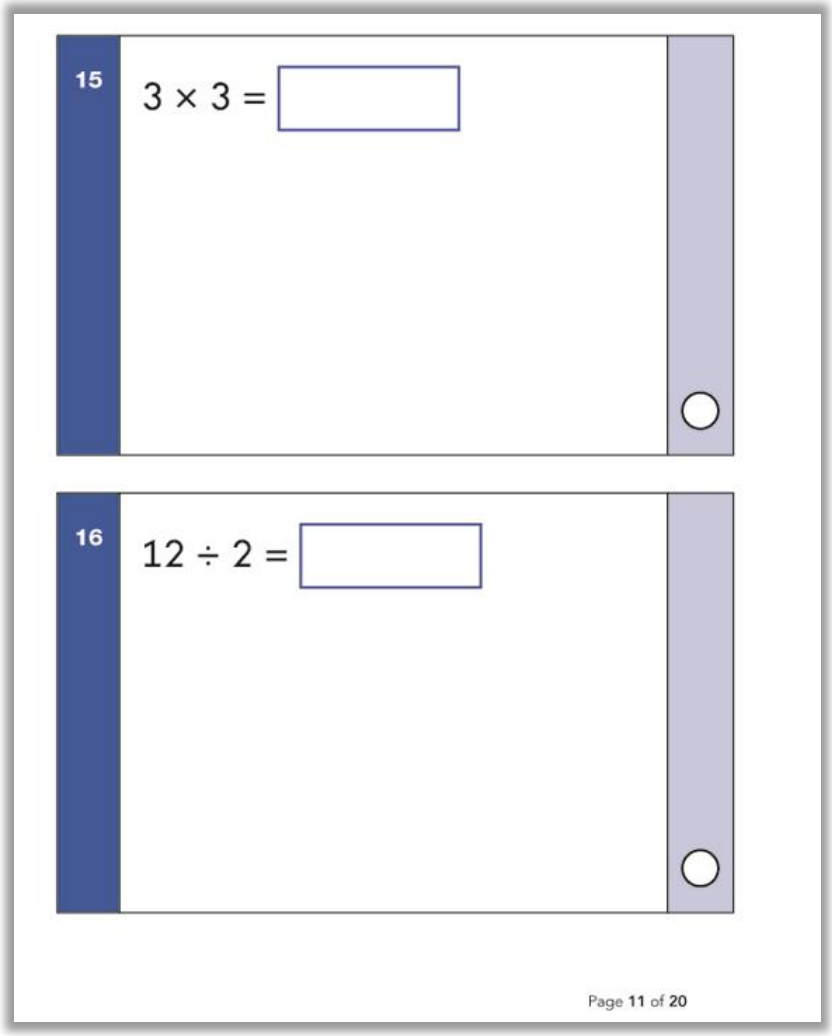
100 – 99 =

If children go wrong with column method, the answer is completely wrong, so unless children have conceptual understanding they do not realise they have made a mistake.

next page

Maths: Sample Questions

Maths Paper 1: Arithmetic



15 $3 \times 3 =$ ☐

16 $12 \div 2 =$ ☐

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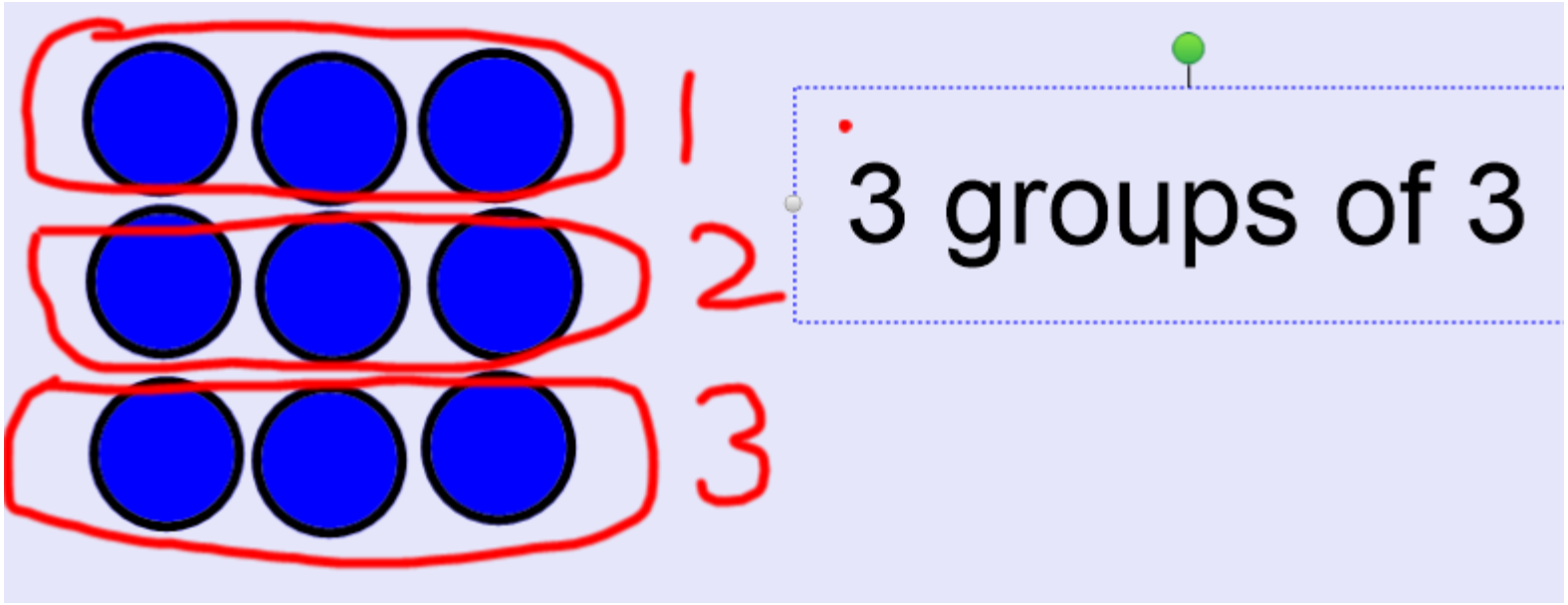
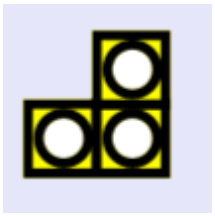
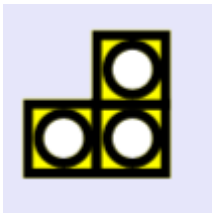
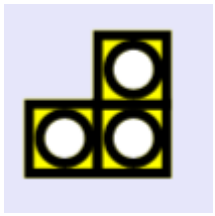
Maths: Sample Questions

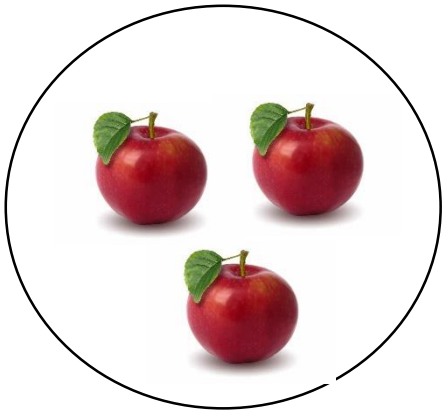
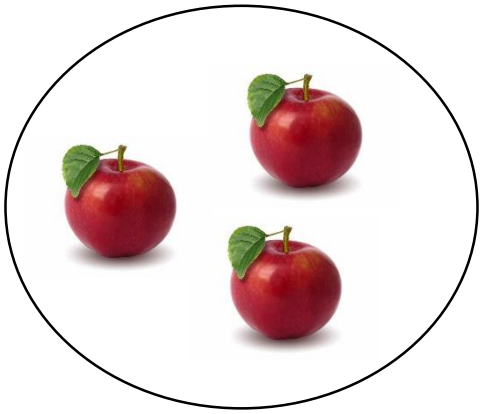
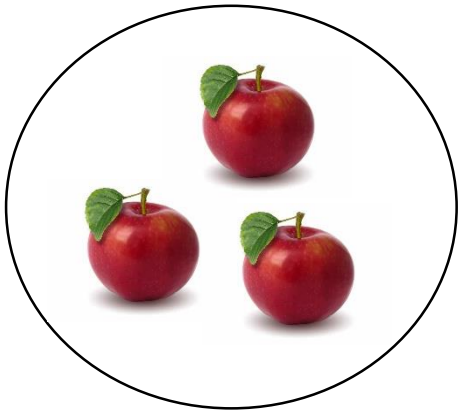
3 x 3 = 9



Maths: Sample Questions

3 x 3 = 9

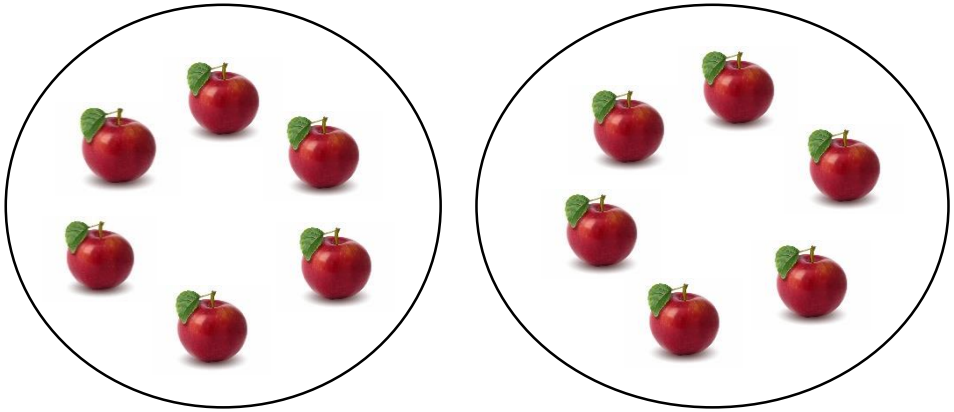




Maths: Sample Questions

$12 \div 2 = 6$

Grouping – 6 groups of 2

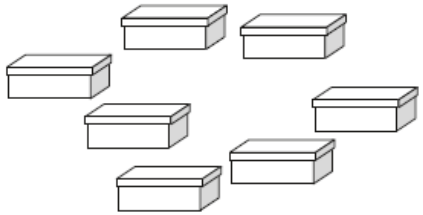


Sharing – 6 in each of the 2 groups

Maths: Sample Questions

Maths Paper 2: Reasoning

7



Sita puts **2** shoes in each of these boxes.

How many shoes are there altogether?

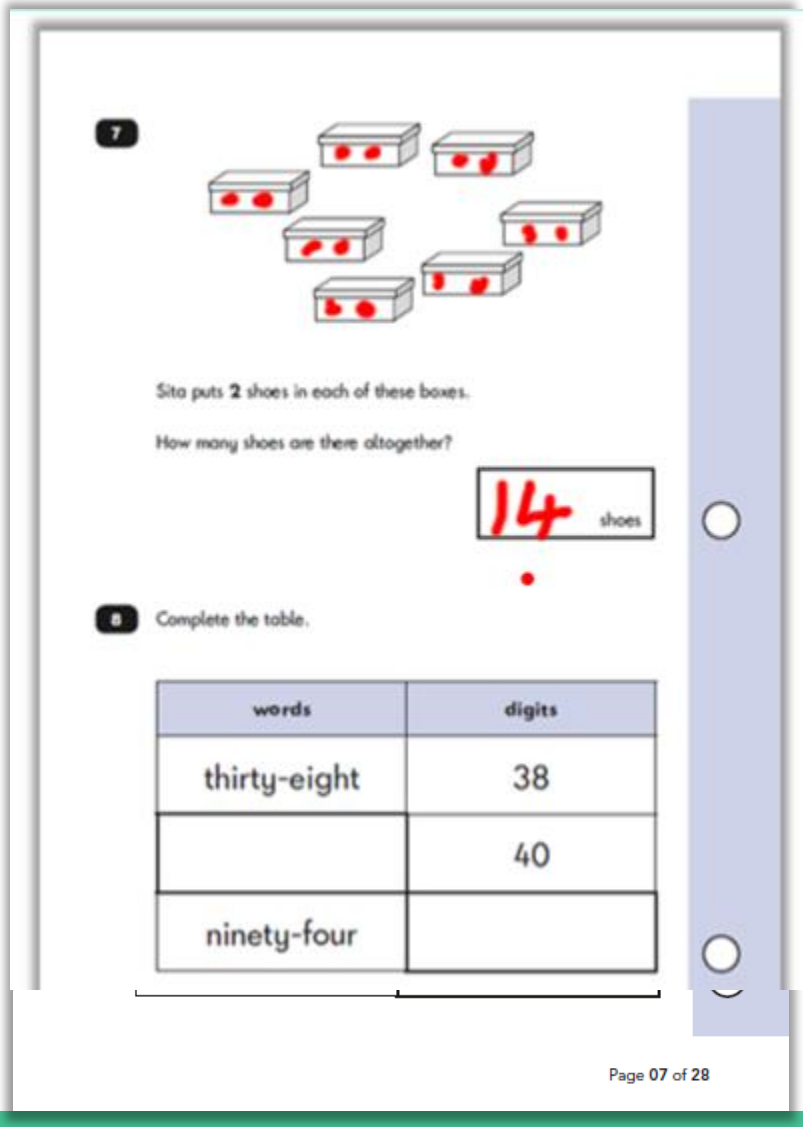
shoes

8 Complete the table.

words	digits
thirty-eight	38
	40
ninety-four	

Maths: Sample Questions

Maths Paper 2: Reasoning



7

Sita puts **2** shoes in each of these boxes.

How many shoes are there altogether?

14 shoes

8 Complete the table.

words	digits
thirty-eight	38
	40
ninety-four	

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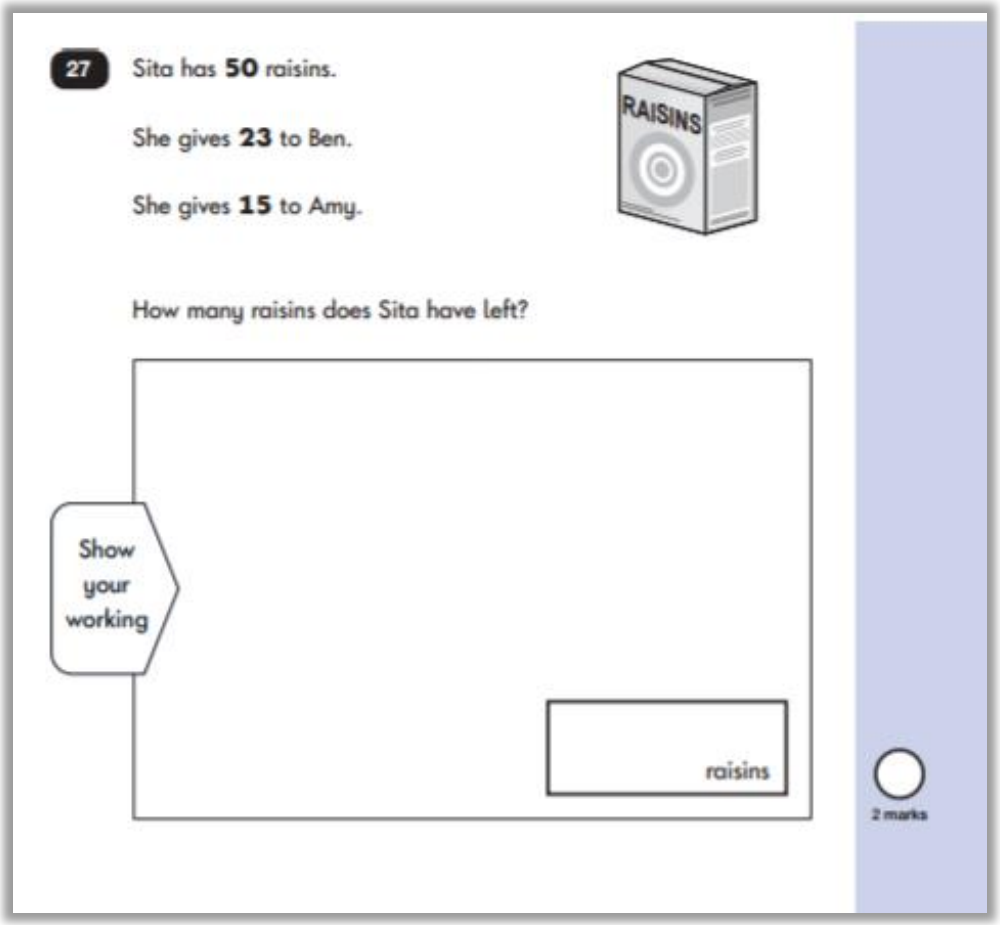
Maths: Sample Questions

Maths Paper 2: Reasoning



27 Sita has **50** raisins.

She gives **23** to Ben.

She gives **15** to Amy.

How many raisins does Sita have left?

Show your working

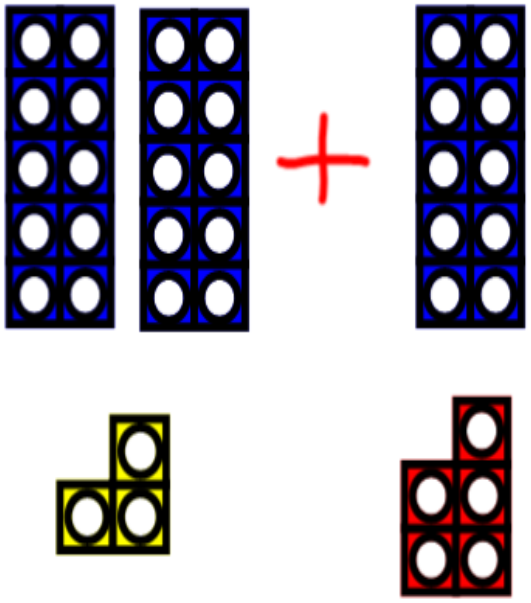
raisins

2 marks

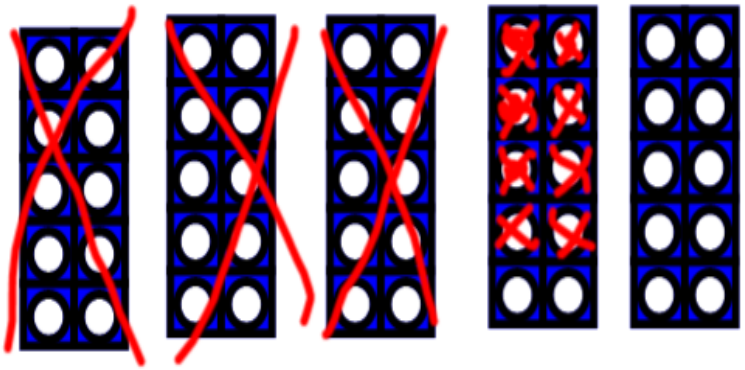
Maths: Sample Questions

50 - 23 - 15 =

23 + 15 = 38



50 - 38 =



2 + 10 = 12

10 + 2 = 12

Mathematics In KS2

- In KS2 the mathematics tests have undergone the biggest change in recent years.
- Children will sit three tests: paper 1, paper 2 and paper 3.
- Paper 1 is for arithmetic lasting for 30 minutes, covering calculation methods for all operations, including use of fractions, percentages and decimals.
- Questions gradually increase in difficulty. Not all children will be expected to access some of the more difficult questions later in the paper.
- Papers 2 and 3 cover problem solving and reasoning, each lasting for 40 minutes.
- Pupils will still require calculation skills but will need to answer questions in context and decide what is required to find a solution.

Mathematics In KS2

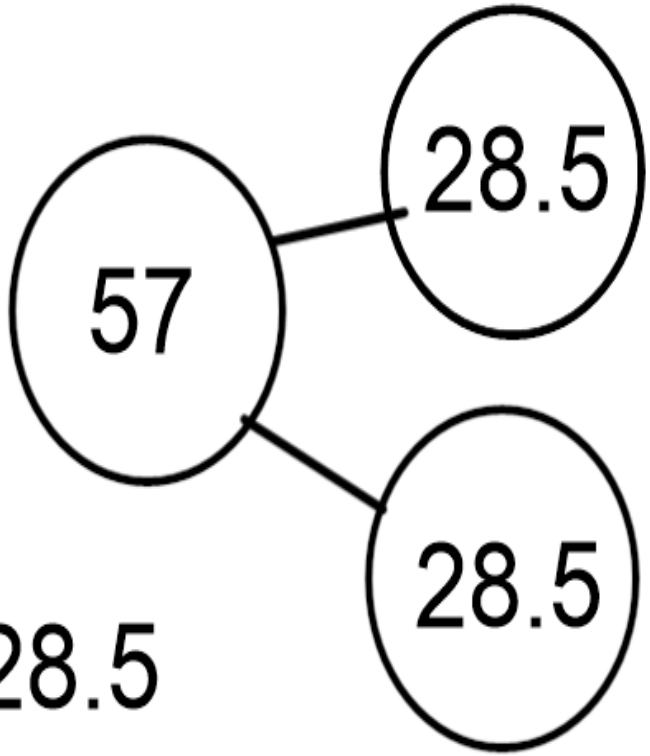
- In last year's SATs only 48% of children answered this question correctly:

- $1\frac{1}{2} \times 57 = 85\frac{1}{2}$ or 85.5 or $\frac{171}{2}$

- Why? – because many children did not understand the question conceptually.

- $1 \times 57 = 57$
- $\frac{1}{2}$ of $57 = 25 + 3.5 = 28.5$
- $57 + 28.5 =$
- Or $\frac{1}{2} \times 57 =$ $\quad + 57$

Mathematics In KS2

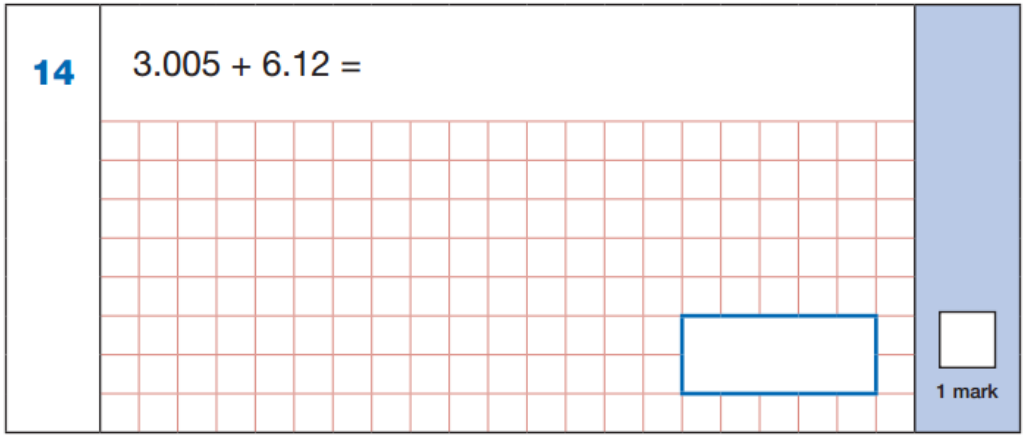


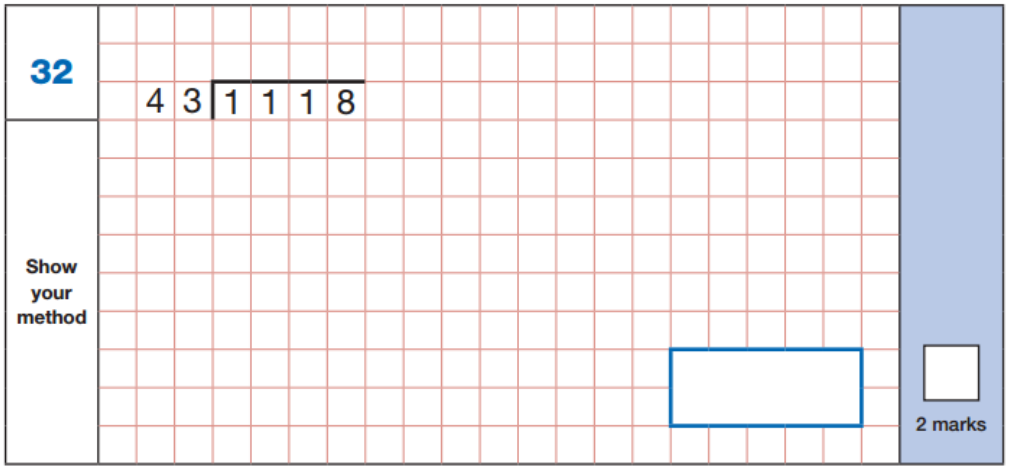
$57 \div 2 = 28.5$

$$\begin{array}{r} 57 \\ +\ 28.5 \\ \hline \\ \hline \end{array}$$

Sample Questions

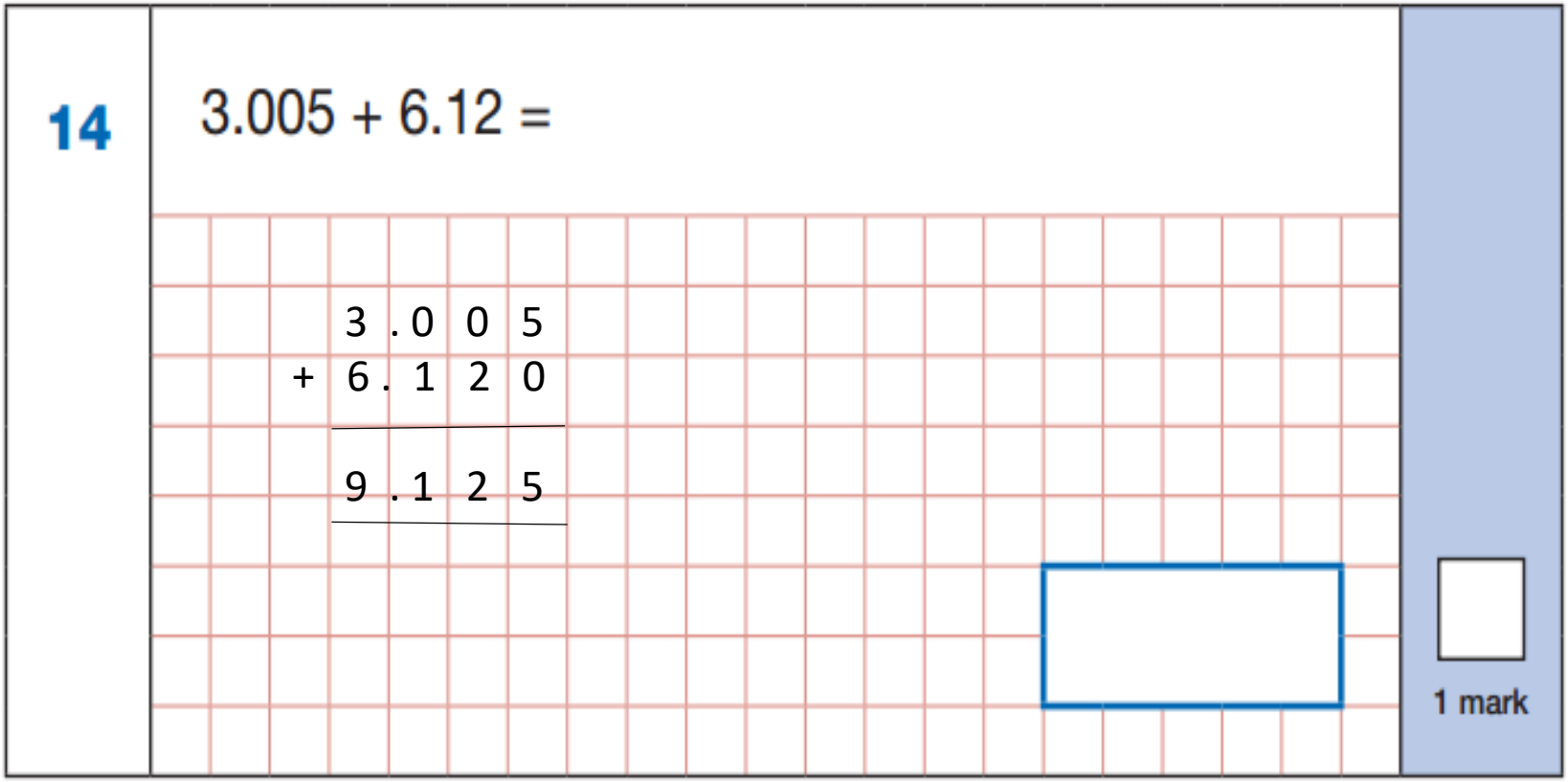
Maths Paper 1: Arithmetic





Sample Questions

Maths Paper 1: Arithmetic



Sample Questions

Maths Paper 1: Arithmetic

32

Show your method

```
      0  0  2  6
4 3 ) 1 ¹1 ¹¹1 ²⁵8
```

Check with the inverse

```
      4  3
  X   2  6
  --------
   2  5  8
      1
  --------
   8  6  0
  --------
1  1  1  8
```

6 x 3, 6 x 40
20 x 3, 20 x 40

1. 43
2. 86
3. 129
4. 172
5. 215
6. 258
7. 301

10 430

2 marks

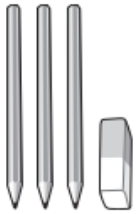
Sample Questions

Maths Paper 2 / Paper 3 : Reasoning

9

6 pencils cost **£1.68**

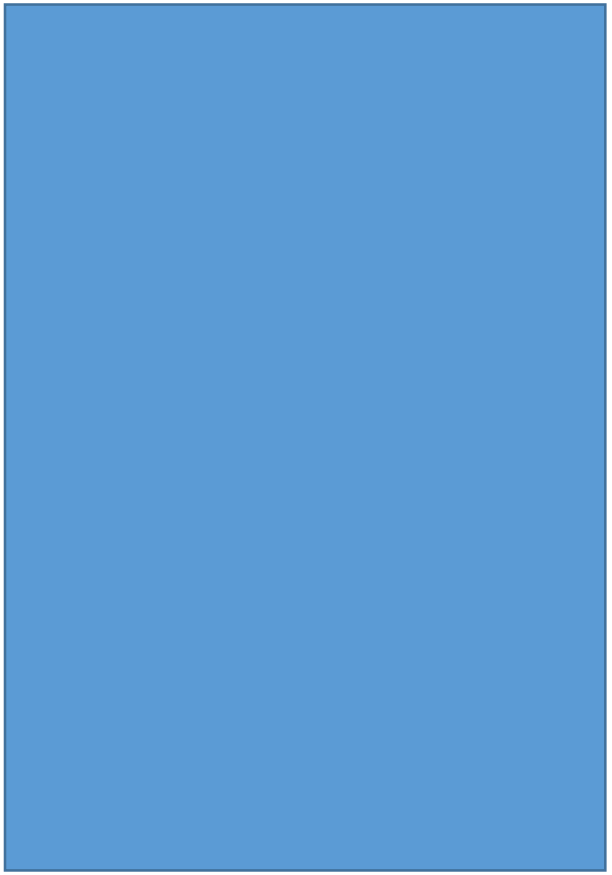
3 pencils and 1 rubber cost **£1.09**



What is the cost of **1 rubber**?

Show your method

2 marks



Sample Questions

Maths Paper 2 / Paper 3 : Reasoning

£1.68 divided by 6
=

168 ÷ 6 =

Then divide the answer by 100.

Next multiply the answer by 3 to get the cost of 3 pencils.

Finally take this away to get the cost of the rubber.

Sample Questions

Maths Paper 2 / Paper 3 : Reasoning

21 $5{,}542 \div 17 = 326$

Explain how you can use this fact to find the answer to **18 × 326**

If 5,542 divided by 17 is 326 then the inverse would be 17 multiplied by 326 to give 5,542. Therefore by adding 326 to this total would give the answer to 18 x 326 as it is one multiple of 326 more.

1 mark

Higher-Attaining Pupils

- In the past, Key Stage 2 tests were aimed at children achieving levels 3-5 (with a national expectation to reach at least level 4).
- This meant that additional level 6 tests were produced for children who demonstrated higher than expected attainment (above level 5).
- Under the new system, there are not any separate tests for the most-able children. All children are aiming to achieve at a scaled score of 100 or more to be at the expected level and ready to progress onto secondary school learning.
- Instead, each test will have scope for higher-attaining pupils to show their strengths.
- This means that some questions towards the end of the tests may be more difficult for many children but they should be encouraged to attempt as much of the test as they are able to.

Working together

- Encourage your child to participate in the Dragon/Rainbow/Solar Maths Challenges and support at home through regular practice to enable them to receive the certificates and prizes.

- Use the Year group booklets with on and offline options and information to help support your child. A little and often approach is often best.

- Ask the class teacher to demonstrate how something has been taught so you can support learning at home using the right language and method/ approach.

How to Help Your Child with every day maths

- Play times tables games.
- Play mental maths games including counting in different amounts, forwards and backwards.
- Encourage opportunities for telling the time.
- Encourage opportunities for counting coins and money e.g. finding amounts or calculating change when shopping.
- Look for numbers on street signs, car registrations and anywhere else.
- Look for examples of 2D and 3D shapes around the home.
- Identify, weigh or measure quantities and amounts in the kitchen or in recipes.
- Play games involving numbers or logic, such as dominoes, card games, draughts or chess.

Any questions?

Thank you for listening.