

Welcome



Times tables parent information session

Miss Lynch and Mrs Dunne
Wednesday 11th October 2023

Darlinghurst
ACADEMY

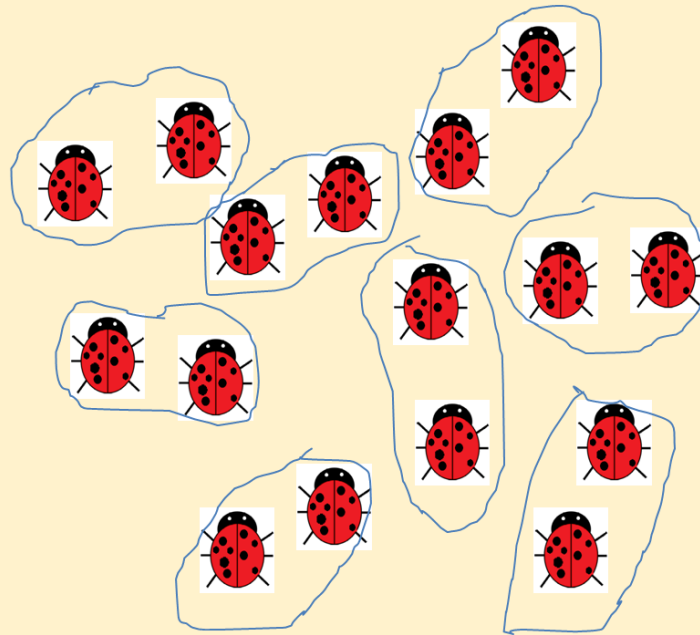


Times Tables are vital to the curriculum throughout school

Reception and Year 1

Some children may start grouping objects in twos

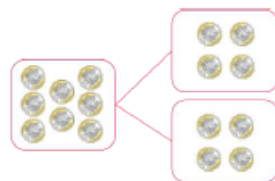
Some children may count on or back in fives and tens



Year 1 Unit 15: Multiplication and division (2 weeks)

Before you start...

- How familiar are pupils with skip counting in 2s, 5s and 10s?
- How familiar are pupils with the part-whole representation?
- How will you make connections to previous learning on fractions?



12

$$\square = \square + \square + \square$$

Video: Division as grouping or sharing



Doubling and halving

L1 Find double and half of amounts of money

Pupils consolidate their understanding of halving and doubling by applying it in the context of money. They calculate the cost of items in a half price sale and learn that if someone buys double the amount, they need to add two equal parts to find the whole.

- ? What representations will you use to support pupils to make connections between doubling and halving?
- ? How will you respond if a pupil says, 'odd numbers cannot be halved'?

Using repeated addition

L2 Recognise and add equal groups

L3 Add equal groups

L4 Solve problems using repeated addition

Pupils explore equal and unequal groups and go on to connect this to recording equal groups as a repeated addition equation, as well as being introduced to a part-whole model with more than two parts. Concrete manipulatives should be used to practise representing repeated addition before pupils apply this to problems.

- ? What language will be necessary to draw attention to connections between the representations you plan to use?
- ? What opportunities will pupils have to notice patterns?

Division as sharing

L5 & L6 Share equally between a set number of groups

Pupils identify fair and unfair sharing and learn that the most efficient way is to share the items one at a time in turn. Pupils will move on to identify the number of objects in each group when given the number of groups. They then solve problems by sharing fairly, including what happens when there are objects 'left over'.

- ? What language structures will you model to support pupils to identify the number of parts and the size of the parts correctly?
- ? How will you respond to a pupil who says '9 shared between two is equal to four'?

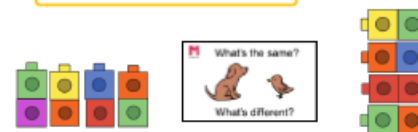
Lesson 10 is suggested as a consolidation lesson. However, you may want to use this earlier in the unit to allow time to secure pupils understanding of repeated addition or division.



Spot the mistake.

To add challenge, consider giving pupils images of 'quarters' where one of the four groups is unequal. Pupils identify the mistake and correct it to make quarters.

Video: Arrays in multiplication and division



Fractions of a quantity

L9 Develop understanding of halves and quarters of quantities

Pupils are given either a half or a quarter of a quantity and they apply their understanding of equal groups to find the whole. Emphasis should be placed on how visual representations can be used here to support conceptual understanding.

- ? What representations and examples will you use to support Conceptual Understanding?

Exploring Arrays

L8 Explore Arrays

Pupils explore arrays using cubes, describing the arrangements using the language of 'rows' and 'columns'. The focus here should be on pattern seeking, and teachers should be led by pupils in their observations of the similarities and differences between the arrays.

- ? What questioning and prompts will you use to prompt pupils to look for patterns?

Division as grouping

L7 Share equally and find the number of groups

Pupils explore problems where they are told how many objects make each group and they explore how many groups they can make, focusing on making equal parts. Clear modelling and re-modelling here will support pupils to identify the difference between grouping and sharing.

- ? What contexts and practical opportunities to group objects will you provide throughout this lesson?

I want to give each child four pens.
How many children can receive pens?



Times Tables are vital to the curriculum throughout school

Year 2

Know and recall multiplication and division facts for 2, 5 and 10s

$$2 \times 5 = 10$$

$$5 \times 2 = 10$$

$$10 \div 2 = 5$$

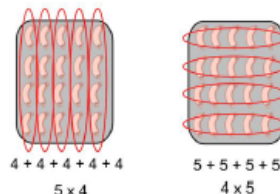
$$10 \div 5 = 2$$



Year 2 Unit 6: Multiplication and Division (3 weeks)

Before starting:

- What previous experiences have pupils had with adding equal groups and sharing equally?
- How confident are pupils in skip counting in different ways?

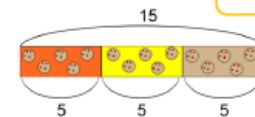


Video: Knowns and unknowns

Video: Arrays - Multiplication and division

Multiplication: say what?!

Due to its commutative nature, multiplication symbols can be read in many different ways: 'groups of', 'lots of', 'times' and 'parts'. For example, ' 3×2 ' could be interpreted as 'three groups of two', 'three parts each with a value of 2' or 'three, two times' which is equal to ' 2×3 '. Use these definitions flexibly alongside models and images, so pupils develop this interconnected understanding.



Video: Division as grouping and sharing

Introducing the multiplication symbol

- L1 Use the multiplication symbol
- L2 Understand that multiplication is commutative

Pupils begin by interpreting arrays and opportunities should be made for dialogue and to allow for the exploration of commutativity: 'I see 4 groups of 5' writing this as ' $5 + 5 + 5 + 5$ ' and 'I see 5 groups of 4' writing this as ' $4 + 4 + 4 + 4 + 4$ ' emphasising how 'the whole is 20' in both cases. Encourage pupils to start making sense of the abstract multiplication symbol by first activating prior knowledge of repeated addition, to allow a meaningful introduction to 'equal groups'. Provide opportunities for pupils to create both concrete and pictorial representations of arrays and make connections to 'part-whole' representations by modelling the associated language.

Introducing the division symbol

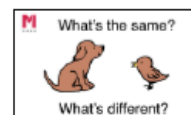
- L3 Use the division symbol when sharing
- L4 Use the division symbol when grouping
- L5 Explore representation of division
- L6 Find related multiplication and division facts

When introducing division, mirror scenarios from lesson 2 to make connections to multiplication as the inverse operation. Continue describing arrays with part-whole language to emphasise these connections as well as the concept of 'equal parts/groups'. This way, pupils can flexibly apply their knowledge of multiplication tables when solving division equations. Two division structures are explored: first 'division as sharing' then 'division as grouping' and pupils explore a mixture of word problems in both contexts. Pupils continue to ask themselves 'what do we know? What do we not know?' to interpret the word problem and represent the known and unknown values using bar models. Pupils apply their learning from earlier lessons in this unit during lesson 6 through interpreting arrays and engaging in dialogue to reason about related multiplication and division facts.

? How can concrete manipulatives and modelling 'part-whole' language help pupils overcome misconceptions such as $3 \div 2 = 6$ or $6 \times 3 = 2$?

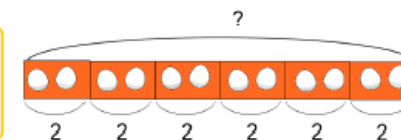
Variation and task design

Tasks in this unit have purposefully been designed with variation in mind – equations have been deliberately chosen to evoke pattern seeking. Encourage pupils to ask themselves 'What's the same? What's different?' about the groups of equations. The purpose is for pupils to pay attention to the underlying mathematical structures. For example, when multiplying, increasing and decreasing the number of groups affects the value of the whole. To find out more about variation have a look at our [articles](#).



Video: Part whole model: multiplication and division – Part 1

Video: Part whole model: multiplication and division – Part 2



Pattern seeking and problem solving

- L12 Spot patterns in 2, 5 and 10 times tables
- L13 Solve multiplication and division word problems

In lesson 12, pupils explore and compare the patterns in the multiplication tables 2, 5 and 10 on a 100 square. Encourage pupils to make conjectures around the properties of these multiplication tables (e.g. multiples of two are always even, multiples of five always have a 5 or a 0 in the ones digit) and then explore and test out their conjectures. Learning across the entire unit is applied in lesson 13 where pupils solve missing number multiplication and division equations to crack a code. The position of the missing number and the 'is equal to' sign has been purposefully varied to encourage deeper mathematical thinking.

There are two consolidation lessons in this unit which can be used to suit the needs of pupils.

Exploring the two, five and ten times tables

- L7 Calculate multiples of two by skip counting
- L8 Explore representations of multiplication problems
- L9 Relate multiplying by two to doubling
- L10 Calculate multiples of five by skip counting
- L11 Calculate multiples of ten by skip counting

In lesson 7, understanding around repeated addition and skip counting in twos is connected to the multiplication table of two. Encourage pupils to make groups of two using concrete manipulatives (cubes / bead strings) to help make sense of the abstract spoken and written equations (e.g. 'one group of 2' = 'one part with a value of 2' = ' $1 \times 2 = 2$ '). Make connections to prior learning in this unit when arrays and bar models are re-introduced to explore word problems in lesson 8. These representations are extended in lesson 9 when pupils make connections between multiplying by two and doubling. Learning (including representations and language structures) from lesson 7-9 is applied to the multiplication tables of five and ten in lessons 10 and 11.

Times Tables are vital to the curriculum throughout school

Year 3

*Know and recall multiplication and division
facts for 3, 4, 6 and 8*

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

$$15 \div 3 = 5$$

$$15 \div 5 = 3$$

$$24 \times 3$$

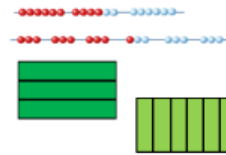


Year 3 Unit 6: Multiplication & Division (2 weeks)

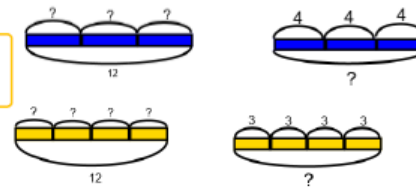
Before you start...

- Can pupils use multiplication and division to describe equal groups or parts?
- Do pupils have experience with division as sharing and division as grouping?
- Can they recall multiplication facts for 2, 5 and 10 times tables?
- Are they aware of the 3 and 4 times table?

Video: Commutativity and inverse



Video: Multiplication and division: Using Cuisenaire



Cuisenaire commutativity

This article gives further suggestions on using Cuisenaire to represent multiplication, particularly considering commutativity.

Is it a part? Is it a whole?

Modelling and encouraging pupils to use accurate mathematical vocabulary to describe multiplication and division will support developing connections and deepen conceptual understanding.
"There are three equal parts each with a value of four"
"There are four parts. Each part has a value of three"

Can ten be shared equally into 3 groups?



Exploring properties of multiplication and division

- L1 Explore commutativity
- L2 Explore inverse relationships

Pupils explore the commutative property of multiplication, that $3 \times 5 = 5 \times 3$, and demonstrate understanding of the relationship between multiplication and division.

? Doing and undoing actions is an important mathematical theme. What opportunities will you take to draw attention to this?

Video: Language structures

Recalling multiplication and division facts

- L3 Recall multiplication and division facts using inverse ($3 \times$)
- L4 Recall multiplication and division facts (2, 3, 4, 5 & 10)

Pupils use a variety of representations, including bar models, to develop understanding of, and fluency with, the 3 and 4 times tables. The same models are used to represent division to emphasise the connection with multiplication.

? How will you develop connections between the abstract calculation and the manipulatives chosen to represent them?

Using knowledge of multiplication to divide

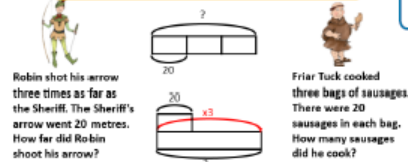
- L5 Use knowledge of factors and multiples

Pupils use the vocabulary of 'factor' and 'multiple' to continue to explore the relationship between multiplication and division. They build representations to demonstrate if a number is a multiple of, or is divisible by, another number.

? How will you develop pupils' confidence with using the terms factor and multiple?

Video: Bar modelling - Multiplication as equal parts

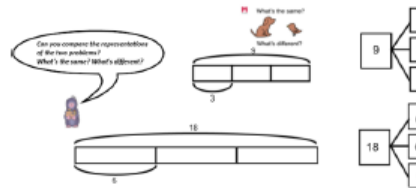
Video: Bar modelling - Multiplication as times as many



You may wish to make use of the consolidation lesson here or before L5. Time should be spent ensuring pupils are secure with multiplication and division facts and language associated with multiplication and division.

Video: Exploring ten times greater

Video: Multiplying and dividing integers by 10



Representing problems using bar models

- L9 Use bar models to represent word problems

Pupils use their understanding of part-whole relationships and known and unknown values in word problems to represent these as bar models. Attention is drawn to different multiplicative structures for both multiplication and division word problems.

? How will you support pupils to create and explain their own bar models?

The Progression in Calculations document has further information on bar models for multiplicative reasoning.

Deriving multiplication facts

- L7 Use doubling to find facts
- L8 Use 'ten times greater'

Pupils use known multiplication facts to complete other calculations, first using doubling to find facts. Connections are made between the 3 and 6 times tables. Pupils use known facts to derive facts where one of the factors is ten times greater.

? How will you establish routines that ensure pupils refer to the known facts they are using?
? What benefits can you see to establishing this routine?

Solving correspondence problems

- L6 Solve correspondence problems

Correspondence problems involve finding all the ways to pair up two sets. Arranging in a grid (see above) reveals the link with arrays and multiplication. This is an opportunity to work systematically and discover an unfamiliar context for multiplication.

? How will you support pupils to work systematically? Will you provide a structure? Could they create their own ways?



Lesson 6 can be moved around within this unit.

Times Tables are vital to the curriculum throughout school

Year 4

Know and recall multiplication and division facts for 7, 9, 11 and 12

$$3 \times 12 = 36$$

$$12 \times 3 = 36$$

$$36 \div 3 = 12$$

$$36 \div 12 = 3$$

$$274 \times 7$$

$$673 \div 7$$

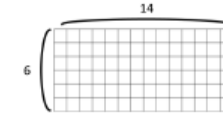
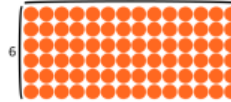
$$23 \times 10 \times 3$$



Before you start...

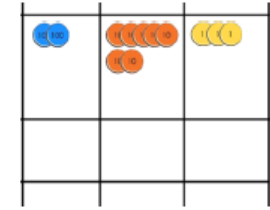
- ### Why array?

$6 \times 14 =$



H What's the same?

 What's different?



Video: Short multiplication with Dienes

$$\begin{array}{r} 273 \\ \times 3 \\ \hline \end{array}$$

Estimate: 900
 $273 \times 3 = \boxed{}$

L1 Derive facts to multiply mentally
L2 Derive facts to divide mentally

? How would you respond to a pupil who says 'to make a number 10 times greater, add a zero'?

- L3 Calculate multiplication facts using distributive law
- L4 Apply distributive law to multiply 2-digit numbers by 1-digit numbers
- L5 Explore multiplying three 1-digit numbers

? What language would you expect pupils to use to describe the distributive law?

- L7 Short multiplication 1
- L8 Short multiplication 2
- L9 Applying multiplication strategies

? How will pupils' knowledge of the distributive law and derived facts support their calculations?

Understanding division

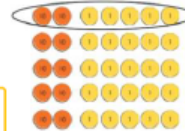
[illegible]

Problems with a number of possible strategies for solving or requiring further exploration will ensure a greater level of mathematical thinking and can promote intellectual curiosity.

Thousands	Hundreds	Tens	Ones
1000	100	10	1
1000 + 1000	100		1
1000	100	10	1
1000 + 1000	100		1
1000	100	10	1
1000 + 1000	100		1

$$\begin{array}{r} 3212 \\ 3 \overline{) 9636} \end{array}$$

Video: Modelling short division with place value counters



$125 \div 5 = \square$



L14-15 Apply multiplication and division to problem solving

L12 Short division 1
L13 Short division 2

? How will you develop connections between the abstract calculation and the manipulatives chosen to represent them?

L10 Mental division strategies
L11 Explore division using known and derived facts

? How can a number line support informal division strategies?

Explaining the written division method is harder than doing it! Think carefully about the equipment, words, movements and gestures you and your pupils use.



Year 4 Multiplication Tables Check (MTC)

'By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work'.

National Curriculum 2014

- The MTC is a brand new statutory KS2 assessment to be taken by pupils at the end of Year 4. This sits alongside the existing end of KS2 SATs assessments in Year 6.
- The current Year 4 cohort nationally will be the first to take this assessment.
- The MTC is focused on the fluent recall of multiplication facts (4×9).
- The MTC will be delivered as an online, on-screen digital assessment and should take less than 5 minutes to complete. This will be taken in school on either a desktop computer or a tablet.



What will the assessment look like?

The assessment will take place over a three-week window in June 2024. Teachers can choose when the children will sit the times table check during that three-week window.

The children will be expected to answer 25 multiplication questions based on all tables up to 12x.

The children will be expected to do this in 6 seconds or less, meaning that quick recall of tables rather than working them out is **essential**.

The test will be scored automatically and will be marked out of 25. Data will be reported back to schools, parents and pupils as a score out of 25.

Children will only be considered to be fluent in their times tables if they achieve **full marks** in the assessment.

Achievement

★ **Belonging**

★ **Confidence**

★ **Determination**

★ **Excellence**



An example...

GOV.UK

Multiplication Tables Check

Remaining time: 5

$$11 \times 2 =$$

1

2

3

4

5

6

7

8

9



0

Enter

Achievement



Belonging



Confidence



Determination



Excellence



Access Arrangements

Access arrangements can be made for children who:

- have an Education, Health and Care (EHC) plan
- have an Individual Education Plan (IEP)
- have English as an additional language and have limited fluency in English

If you have any questions, please ask at the end



What if my child does not achieve full marks in the MTC?

The MTC will serve as a measure of how well children understand and can recall their times table knowledge.

Times tables are vital to the Year 5 and Year 6 curriculum and gaps in their knowledge will hold them back when completing work in Years 5 and 6.

Any child who does not achieve full marks in the MTC will receive further additional support in the form of interventions to plug any gaps in their times table knowledge in Years 5 and 6.

The MTC will serve as a helpful tool for teachers and schools in identifying children with gaps in their mathematical knowledge.



Children who are not fluent in their times tables by the end of Year 4 will struggle to access the Year 5 and Year 6 curriculum, making learning new skills and concepts far more difficult.



Times Tables are vital to the curriculum throughout school

Year 5

Children are expected to be fluent in their times tables up to $12 \times$

Know and recall squared and cubed numbers (3×3 , $3 \times 3 \times 3$)

- $4,623 \times 45$
- $4724 \div 8$
- 40×700
- 5×90
- What is one twelfth of 36?
- Equivalent fractions $\frac{3}{5} = \frac{12}{20}$



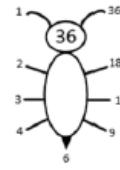
Year 5 Unit 4: Multiplication & Division (3 weeks)

Before you start...

- What facts can pupils fluently recall?
- How familiar are your pupils with:
 - a range of models and manipulatives to represent multiplication and division
 - the different calculations that one array can represent
 - commutativity of multiplication
 - the relationship between multiplication and division?

Video: Representing properties of number

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



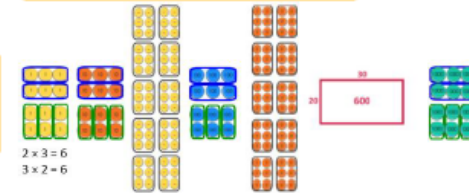
Video: Factor buggin'

Prime numbers

This [website](#) will allow for further thinking on the use of prime numbers

Pass the bar!

You may wish to go through our e-learning modules on [Bar Modelling Part 1](#) and [Bar Modelling Part 2](#).



Understanding multiples, factors & squares

- L1 Identify multiples and factors
- L2 Find all factor pairs of a number
- L3 Solve problems using factors, multiples and square numbers
- L4 Establish if a number less than 100 is prime

This sequence of lessons explores the properties of numbers. Teaching should focus on comparing and contrasting the features of factors, multiples, square and prime numbers. This should lead to pattern seeking and pupils developing deeper understanding of these key properties of number.

- ? How do you want pupils to find all of the factors of a number?
- ? How do you want pupils to decide if a number is prime?

Exploring mental strategies for multiplication & division

- L5 Multiply and divide by 10, 100 and 1000
- L6 Multiply and divide mentally using doubling and halving
- L7 Multiply and divide using derived facts

Within these lessons, pupils should be exposed to a range of strategies to support increasingly efficient mental multiplication and division. Encourage pupils to compare and contrast their ideas to identify similarities and differences and encourage them to consider the most appropriate strategy *for them*.

- ? Which representations will support pupils to demonstrate their strategies?
- ? Doing and undoing actions is an important mathematical theme. What opportunities will you take to draw attention to this?

Thinking in blocks?

This [website](#) offers one possibility in allowing pupils to represent problems more practically with bar models.

Number talks

Watch this Jo Boaler [video](#) on strategies for multiplication.

Using and explaining division methods

- L12 Use knowledge of multiples to divide
- L13 Use a written method to divide
- L14 Solve problems involving division with remainders

As with lessons on multiplication, pupils should represent and solve problems choosing from a range of strategies, resorting to the written method only when it is the most efficient strategy for them. Pupils may draw or visualise bar models to make sense of the problem and should be encouraged to estimate mentally.

- ? Can pupils identify the similarities and differences when solving multiplication and division problems?

Using and explaining multiplication methods

- L9 Use a written method to multiply
- L10 Multiply two 2-digit numbers using long multiplication
- L11 Multiply using knowledge of factors

As well as encountering and practicing formal written methods, pupils should explore how to represent problems and continue to develop flexibility when selecting strategies.

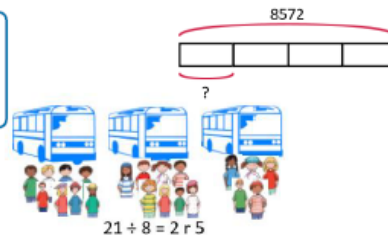
Exploring and selecting appropriate strategies

- L8 Solve problems using a range of strategies

You may wish to use more than one lesson to allow pupils to explore applying strategies from previous lessons in an unfamiliar context. The focus is on justifying the efficiency of the strategy.

- ? How might pupils decide on an appropriate strategy?
- ? How will you encourage pupils to justify their choices?
- ? What might affect the number of strategies pupils are able to access / understand / apply? What can you do to scaffold access?

L15 is the suggested time for a consolidation lesson to allow pupils more time on exploring multiplication and division problems.



Three buses are needed

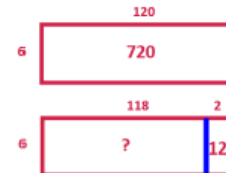
Video: Short multiplication using an area model

Video: Short multiplication with regrouping using an area model

Video: Long multiplication algorithm



Pupils should feel confident in using a range of strategies. Maths Meetings should be used to continue to discuss and explore a range of strategies for a given calculation.



Times Tables are vital to the curriculum throughout school

Year 6

Children are expected to be fluent in their times tables up to 12x by the end of Year 4.

$$3624 \times 76$$

$$3624 \div 65$$

What is nine tenths of 70?

$$0.9 \times 200$$

What is 71% of 1800?

$$2/6 \times 1/9$$

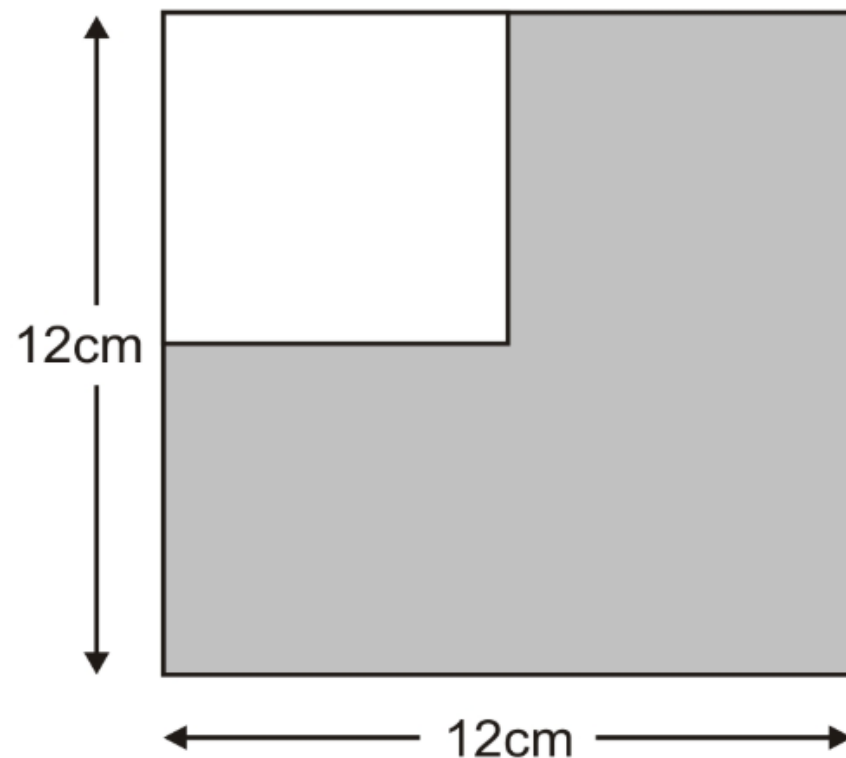
Ratio

$ab = 36$. What are the possible values of a and b?



A white square is painted in one corner of a grey square.

Each side of the white square is **half** the length of a side of the grey square.



Not actual size



Tick the fractions **less than** $\frac{5}{8}$

$$\frac{1}{2}$$

☐

$$\frac{2}{8}$$

☐

$$\frac{3}{4}$$

☐

$$\frac{7}{16}$$

☐

$$\frac{24}{32}$$

☐

Achievement



Belonging



Confidence



Determination



Excellence



The International Space Station orbits the Earth at a height of 250 miles.

What is the height of the International Space Station in **kilometres**?

Use 8 kilometres equals 5 miles.

km

What are we doing to prepare children in school?

Times tables are taught every day as part of your child's maths lessons

All children have access to a Times Table Rockstars account. This is an excellent online game where children are encouraged to practice their tables in a competitive way against peers, themselves or other members of the school

Teachers test times tables weekly to check where pupils are up to

Any children who are not secure with their times tables at different stages of the year receive interventions to help them catch up

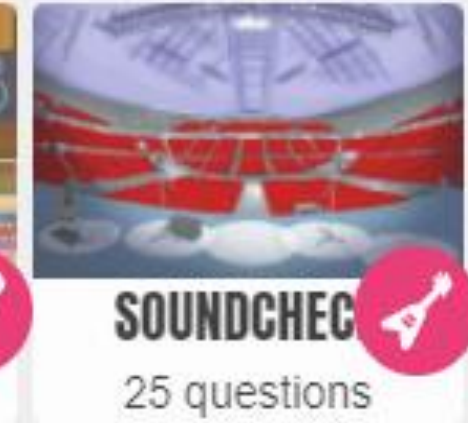
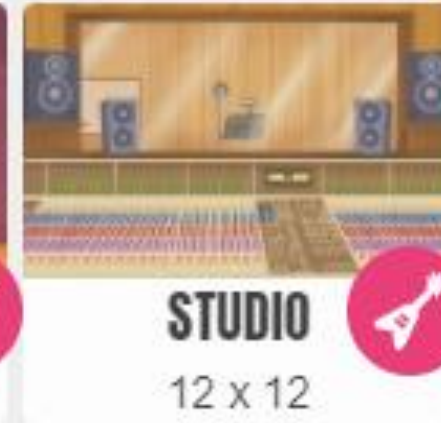


How can you help at home?

- Encourage your child to actively use Times Table Rockstars. Minimum 6 minutes of gameplaying a day - establish a routine!
- Quiz your children regularly and at random on their times tables. This could be done whilst cooking tea together, during car journeys or on the walk to school
- Concentrate on one times table at a time – refer to TTS Garage!
- Use times table wall charts at home
- Create flashcards with your child for each times table and play games like snap or matching them up in specific time. This works well as a competition between siblings, parents or even other family members!
- Challenge your children to 'beat Siri' in their times tables!
- The Oxford Owl Website has some great resources: <https://www.oxfordowl.co.uk/for-home/kids-activities/times-table-activities/#TimesTableGames>



SINGLE PLAYER



Achievement ★ Belonging ★ Confidence ★ Determination ★ Excellence

Intro video-TT Rock stars



Achievement ★ **Belonging** ★ **Confidence** ★ **Determination** ★ **Excellence**



Questions

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