Key Instant Recall Facts (KIRFs)

What are KIRFs?

Our KIRFs have been designed to support the development of the core declarative knowledge that underpins much of the maths work in schools. Each objective has been carefully selected based on the National curriculum. Key instant recall facts help enormously with mental agility within Maths lessons and when children move onto written calculations, knowing these facts is very beneficial. These facts are particularly useful when calculating, be it adding, subtracting, multiplying or dividing.

The rote learning of certain numeracy facts, such as times tables, has always been a crucial part of maths development. However, alongside the times tables there are many other key number facts that are needed to make complex reasoning and problem solving much more accessible.

Each half term children will be given a different KIRF objective to practise and learn in school and at home. They will be given the opportunity to recall these at the start of every maths lesson. For your children to become more efficient in recalling them easily, they need to be practiced frequently and for short periods of time. **Little and often is key!**

Over the course of primary school - if the KIRFs are developed fully - children will be more confident with number work, understand its relevance, and be able to access the curriculum much more easily. They will be able to apply what they have learnt to a wide range of problems that confront us regularly.

Why practise the KIRFs?

Working memory plays an essential role in children's mathematical learning (De Smedt et al., 2009) but it is a system with limited capacity. When a mathematical task requires processing, or actively maintaining, too much information in the working memory, it can lead to cognitive overload.

The repetition needed to learn the KIRFs by heart should allow children to store this knowledge into their long-term memories, helping them to free up their working memories more in their lessons. If a child knows their key facts by heart, they can focus on learning new steps or procedures, and then develop their reasoning and problem-solving skills. Once these facts are committed to long term memory it becomes a matter of retrieval.

How to practise KIRFS:

This KIRFs handbook includes practical ideas to assist your child in grasping the key facts and contains helpful suggestions of ways in which you could make this learning interesting and relevant. KIRFs are not designed to be a time-consuming task and can be practised anywhere – in the car, walking to school, etc. Regular practice - **little and often** – helps children to retain these facts and keep their skills sharp. Throughout the half term, the KIRFs will also be practised in school and your child's teacher will assess whether they have been retained. However, please note that the practise of KIRFs should be viewed as a tool for retrieval, not a formal assessment.

You do not need to practise them all at once; perhaps you could have a fact of the day. If you would like more ideas, please speak to your child's teacher.

Reception:

https://play.numbots.com/#/intro

Objective: I can count forwards or backwards to 10 (20)

- Counting objects around the home, making piles of 0, 1, 2, 3, 4 and 5, and then counting them in order to 5 and back…use sweets, Lego, fruit, stones, leaves etc.
- Looking for numbers up to 5 around the home and when you are out and about…can they count on or back from that number?
- Singing number songs where the numbers are going backwards, e.g. Five little speckled frogs, five little monkeys jumping on the bed etc.
- Counting objects around the home, making piles of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10, and then counting them in order to 10 and back…use sweets, Lego, fruit, stones, leaves etc
- Looking for numbers up to 10 around the home and when you are out and about… can they count on or back from that number?
- What can they do in 10 seconds? Take it in turns with your child to count while the other performs the task, e.g. star jumps, building a Lego tower etc.
- Counting objects around the home finding methods of counting accurately, e.g moving each object as it is counted…….use sweets, Lego, fruit, stones, leaves etc
- Looking for numbers up to 20 around the home and when you are out and about.
- Count objects around the home and then write the correct numeral to match the quantity counted. Repeat with other numbers. Discuss which number is the biggest/smallest or is more/less than the other. How do you know?

Objective: I can say one more and one less than a number

- A number track is very useful to practise counting on and back.
- Your child has ten pieces of carrot on their plate. What would one more / one less be?
- Play with building blocks or multilink cubes – count the blocks and practise adding 1 more or taking 1 away.

Objective: I know addition number bonds to 10

- Using items around the house to find different ways of making 5, e.g. one blue teddy and four red teddies. One and four make five.
- Making up stories with items around the home, e.g. there are 2 cars in the car park and 3 more cars arrive, how many cars altogether? Two and three make five.
- Asking questions during daily routines, e.g. you have 1 sausage on your plate and I have 4 sausages on my plate, how many sausages altogether? One and four make five.
- Using items around the house to find different ways of making 10, e.g. one blue teddy and nine red teddies. One and nine make ten.
- Making up stories with items around the home, e.g. there are 2 cars in the car park and 8 more cars arrive, how many cars altogether? Two and eight make ten.
- Asking questions during daily routines, e.g. you have 4 sausages on your plate and I have 6 sausages on my plate, how many sausages altogether? Four and six make ten.
- Jack Hartmann Number bonds to 10 singing and moving you tube clip!
- https://www.youtube.com/watch?v=lD9tjBUiXs0 Number bonds to 10
  https://www.youtube.com/watch?v=ch7KzI3n2Zk Number pairs to 10

Objective: I know addition and subtraction number bonds to 10

- Making up stories with items around the home, e.g. there are 2 cars in the car park and 8 more cars arrive, how many cars altogether? Count on from the 2 to find the answer.
- Asking questions during daily routines, e.g. you have 10 chips on your plate and I steal 2, how many are left? Count back from 10 to find the answer.

Objective: I know doubles to 10

- Use toys or building blocks etc. – make a group of 4 blocks and ask your child to make an identical group. How many are there now? Double 4 is 8.
- Ping Pong – In this game, the parent says 'Ping' and the child replies 'Pong'. Then the parent says a number and the child doubles it. For the harder version, the adult can say 'Pong' and the child replies 'Ping' then halves the number.
- Practise online – Go to www.conkermaths.org and then see how many questions you can answer in just 90 seconds.

Objective: I know halves to 10

- Have an even number of toys or building blocks etc. – share equally into 2 groups e.g. 8 shared equally into 2 groups is 4. Half of 8 is 4.
- Ping Pong – In this game, the parent says 'Ping' and the child replies 'Pong'. Then the parent says a number and the child doubles it. For the harder version, the adult can say 'Pong' and the child replies 'Ping' then halves the number.
- Practise online – Go to www.conkermaths.org and then see how many questions you can answer in just 90 seconds.

RECEPTION

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Reception	I can count forwards and backwards to 10 (20)	I can say one more and one less than a number	I know addition number bonds to 10	I know addition and subtraction bonds to 10	I know doubles to 10	I know halves to 10

Year 1

https://play.numbots.com/#/intro
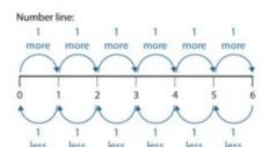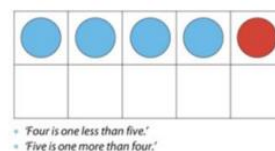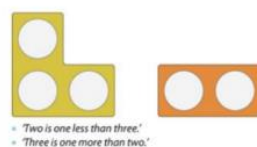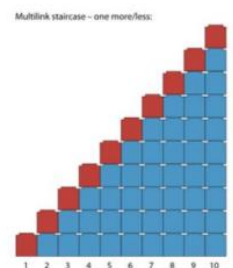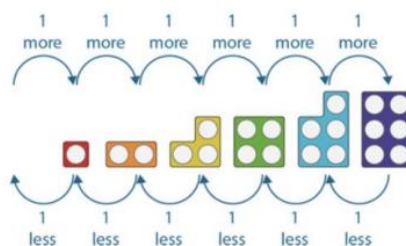
Objective: I know number bonds to 10

- Use practical resources
- Make a poster – We use Numicon at school. You can find pictures of the Numicon shapes here: www.bit.ly/NumiconPictures – your child could make a poster showing the different ways of making numbers.
- Play Games – You can play number bond pairs online at www.conkermaths.org and then see how many questions you can answer in just one minute.

Objective: I know fact families to 10

- Use practical resources
- Play Games – You can play number bond pairs online at www.conkermaths.org and then see how many questions you can answer in just one minute.

Objective: I know number bonds to 20

- Use practical resources
- Make a poster – We use Numicon at school. You can find pictures of the Numicon shapes here: www.bit.ly/NumiconPictures – your child could make a poster showing the different ways of making numbers.
- Play Games – You can play number bond pairs online at www.conkermaths.org and then see how many questions you can answer in just one minute.

Objective: I know doubles and halves of numbers to 10

- Use toys or building blocks etc. – make a group of 4 blocks and ask your child to make an identical group. How many are there now? Double 4 is 8. For halves, group items into two equal groups.
- Ping Pong – In this game, the parent says 'Ping' and the child replies 'Pong'. Then the parent says a number and the child doubles it.
- For the harder version, the adult can say 'Pong' and the child replies 'Ping' then halves the number. Practise online – Go to www.conkermaths.org and then see how many questions you can answer in just 90 seconds.

Objective: I can count forwards and backwards to 50 from any given number

- https://www.youtube.com/watch?v=JPdDbzwi5iQ
- https://www.youtube.com/watch?v=bGetqbqDVaA
- https://www.youtube.com/watch?v=MIE2OPEHYLE
- Pronunciation – Make sure that your child is pronouncing the numbers correctly and not getting confused between thirteen and thirty

Objective: I can count in 2s, 5s and 10s

- Practise counting on in 2s, 5s and 10s.
- For counting in 2s, use toys or counters and group into 2s and have children count them in 2s.
- Watch songs on YouTube: https://www.youtube.com/watch?v=GvTcpfSnOMQ
https://www.youtube.com/watch?v=Ftati8iGQcs
https://www.youtube.com/watch?v=amxVL9KUmq8

YEAR 1

Year 1	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	I know number bonds to 10	I know fact families to 10	I know number bonds to 20	I can count forwards and backwards to 50 from any given number.	I know doubles and halves of numbers to 10.	I can count in 2s, 5s and 10s

The concept of '5 and a bit' structure
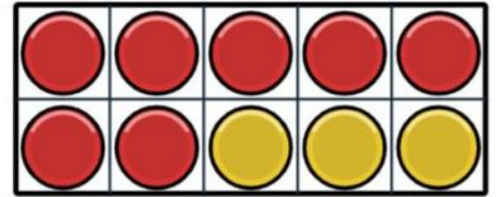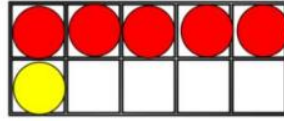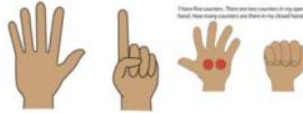
6	
5	1

- 'Six is five and one more.'
- 'Six is the whole; five is a part; one is a part.'
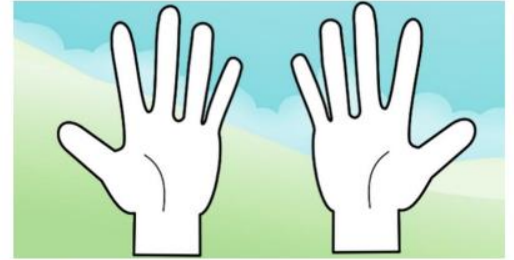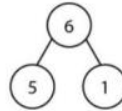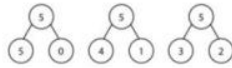
ncetm.org.uk/classroom-resources/primm-1-03-composition-of-numbers-0-5/
Number Blocks

9 − 2 = ☐

☐ − 2 = ☐

☐ − 2 = ☐

2 = 1 + 1
half of 2 is ☐

4 = 2 + ☐
half of ☐ is ☐

8 = ☐ + ☐
☐ of ☐ is ☐

Year 2

https://play.numbots.com/#/intro

Objective: I know number bonds to 20

- Use what you already know – Use number bonds to 10 (e.g. 7 + 3 = 10) to work out related number bonds to 20 (e.g. 17 + 3 = 20).
- Use practical resources – Make collections of 20 objects.
- Ask questions such as, 'How many more conkers would I need to make 20?'
- Make a poster – We use Numicon at school. You can find pictures of the Numicon shapes here: www.bit.ly/NumiconPictures – your child could make a poster showing the different ways of making 20.
- Play Games – You can play number bond pairs online at www.conkermaths.org and then see how many questions you can answer in just one minute

Objective: I know number bonds to 100

- Watch songs on YouTube: https://www.youtube.com/watch?v=GvTcpfSnOMQ https://www.youtube.com/watch?v=Ftati8iGQcs https://www.youtube.com/watch?v=amxVL9KUmq8

Objective: I can recall doubles and halves to 20

- Use what you already know – Encourage your child to find the connection between the 2 times table and double facts.
- Ping Pong – In this game, the parents say 'Ping,' and the child replies 'Pong.' Then the parent says a number and the child doubles it. For a harder version, the adult can say, 'Pong.' The child replies, 'Ping,' and then halves the next number given.
- Play Online – Go to www.educationcity.com or www.conkermaths.org

Objective: I know multiplication and division facts for the 2- and 10-times tables

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Use what you already know – If your child knows that 2 x 5 = 10, they can use this fact to work out that 2 x 6 = 12
- Test the Parent – Your child can make up their own tricky division questions for you e.g. What is 18 divided by 2? They need to be able to multiply to create these questions.
- Test the Parent – Your child can make up their own tricky division questions for you e.g. What is 70 divided by 10? They need to be able to multiply to create these questions.
- Apply these facts to real-life situations – How many toes are in your house? What other multiplication and division questions can your child make up?

Objective: I know multiplication and division facts for the 5 times table

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk

- Spot patterns – What patterns can your child spot in the 5 times table? Are there any similarities with the 10 times table?
- Test the Parent – Your child can make up their own tricky division questions for you e.g. What is 45 divided by 5? They need to be able to multiply to create these questions.

Objective: I can tell the time to the nearest 5 minutes, including quarter past and half past times

- Talk about time – Discuss what time things happen. When does your child wake up? What time do they eat breakfast?
- Make sure that you have an analogue clock visible in your house or that your child wears a watch with hands.
- Ask your child the time regularly – You could also give your child some responsibility for watching the clock: 'The cakes need to come out of the oven at quarter past four.' 'We need to leave the house at half past eight.'

YEAR 2

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 2	I know number bonds to 20	I know number bonds to 100 (e.g. 30 + 70)	I can recall doubles and halves to 20	I can recall multiplication and division facts for the 2 and 10 x tables.	I can recall multiplication and division facts for the 5 x tables.	I can tell the time - to five minutes, including quarter past/to the hour

What numbers are shown?
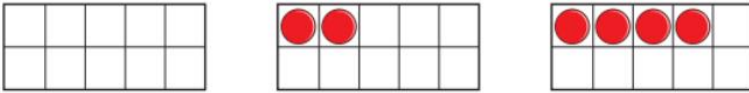
Make the next two numbers in the pattern.
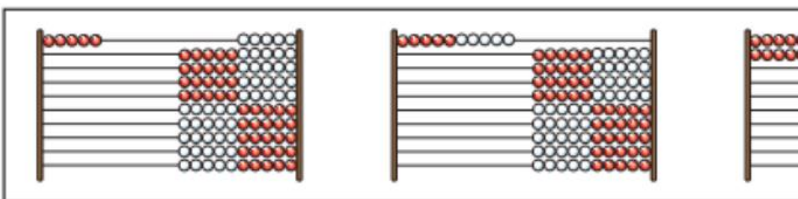
L.O.: I can identify number bonds to 20.

5+5   6+4   7+3   8+2   9+1

https://ttrockstars.com/
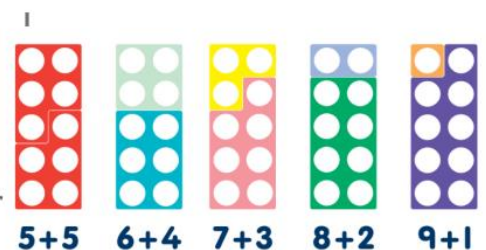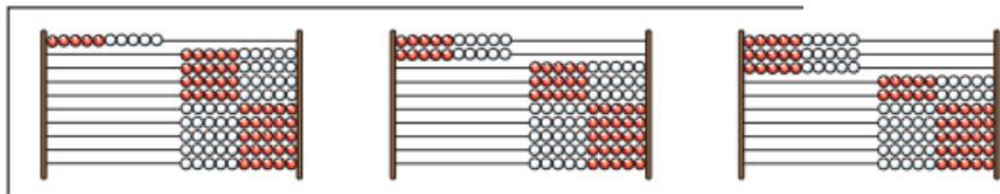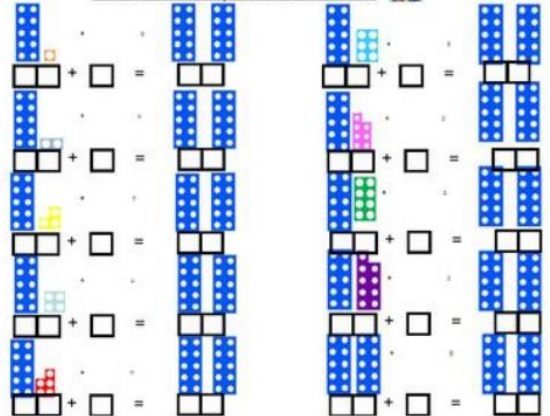
Objective: I know all number bonds to 20 and can use number bonds to derive pairs of numbers that total 100 e.g. 64 + 36 = 100

- Play Games – There are missing number questions at www.conkermaths.org and see how many questions you can answer in just one minute.

Objective: I know multiplication and division facts for the 2,5 and 10 x tables

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Use what you already know – If your child knows that 2 x 5 = 10, they can use this fact to work out that 2 x 6 = 12
- Test the Parent – Your child can make up their own tricky division questions for you e.g. What is 18 divided by 2? They need to be able to multiply to create these questions.
- Test the Parent – Your child can make up their own tricky division questions for you e.g. What is 70 divided by 10? They need to be able to multiply to create these questions.
- Apply these facts to real-life situations – How many toes are in your house? What other multiplication and division questions can your child make up?
- Spot patterns – What patterns can your child spot in the 5 times table? Are there any similarities with the 10 times table?
- Test the Parent – Your child can make up their own tricky division questions for you e.g. What is 45 divided by 5? They need to be able to multiply to create these questions.

Objective: I know the multiplication and division facts for the 3 times tables

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Buy one get three free – If your child knows one fact (e.g. 3 x 5 = 15), can they tell you the other three facts in the same fact family?
- WARNING! – When creating fact families, children sometimes get confused by the order of the numbers in the division number sentence. It is tempting to say that the biggest number goes first, but it is more helpful to say that the answer to the multiplication goes first, as this will help your child more in later years when they study fractions, decimals and algebra. E.g. 3 x 12 = 36. The answer to the multiplication is 36, so 36 ÷ 3 = 12 and 36 ÷ 12 = 3

Objective: I know multiplication and division facts for the 4 times tables

- What do you already know? – Your child will already know many of these facts from the 2 times tables.
- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.

- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Double and double again – Multiplying a number by 4 is the same as doubling and doubling again. Double 6 is 12 and double 12 is 24, so 6 x 4 = 24.
- Buy one get three free – If your child knows one fact (e.g. 12 x 4 = 48), can they tell you the other three facts in the same fact family? 4 x 12 = 48, 48/12=4 and 48/4=12.

<u>Objective: I know multiplication and division facts for the 8 times tables</u>

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Double your fours – Multiplying a number by 8 is the same as multiply by 4 and then doubling the answer. 8 x 3 = 24 and double 24 is 48, so 8 x 3 = 24. Five six seven eight – fifty-six is seven times eight (56 = 7 x 8) I ate and ate until I was sick on the floor – eight times eight is sixty-four (8 x 8 = 64)
- Use memory tricks – For those hard-to-remember facts, www.multiplication.com has some strange picture stories to help children remember.

<u>Objective: I can tell the time to the nearest minute (analogue & digital) on 12- and 24-hour clocks</u>

- Talk about time – Discuss what time things happen. When does your child wake up? What time do they eat breakfast?
- Make sure that you have an analogue clock visible in your house or that your child wears a watch with hands.
- Once your child is confident telling the time, see if you can find more challenging clocks e.g. with Roman numerals or no numbers marked.
- Ask your child the time regularly – You could also give your child some responsibility for watching the clock: 'The cakes need to come out of the oven at twenty-five minutes past four exactly.' 'We need to leave the house at twenty-five to nine.'

YEAR 3

Year 3	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	I know all number bonds to 20 and can use number bonds to derive pairs of numbers that total 100 e.g. 64 + 36 = 100	I know multiplication and division facts for the 2,5 and 10 x tables	I know the multiplication and division facts for the 3 times tables	I know multiplication and division facts for the 4 times tables	I know multiplication and division facts for the 8 times tables	I can tell the time to the nearest minute (analogue & digital) on 12 and 24 hour clocks

47 + 53 = 100

40 7 + 3 50

10
+
90

61 + 39 = 100

+ 9   + 30

61   70   100

_____ × _____ = _____

_____ × _____ = _____

_____ ÷ _____ = _____

_____ ÷ _____ = _____

0   16   32   40   64   80

Year 4

https://ttrockstars.com/
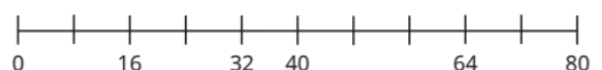
Objective: I can find out what must be added to any 2-digit number to make 100.

- Buy one get three free – If your child knows one fact (e.g. 85 + 15 = 100), can they tell you the other three facts in the same fact family? 15 + 85 = 100, 100-15=85 and 100-85=15.
- Use number bonds to 10 – How can your number bonds to 10 help you work out number bonds to 100?
- Play Games – There are missing number questions at www.conkermaths.org. See how many questions you can answer in 90 seconds. There is also a number bond pair game to play.

Objective: I know the multiplication and division facts for the 3-, 6- and 9-times tables

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Double your threes – Multiplying a number by 6 is the same as multiplying by 3 then doubling the answer. 7 x 3 = 21 and double 21 is 42, so 7 x 6 = 42
- Buy one get three free – If your child knows one fact (e.g. 3 x 6 = 18), can they tell you the other three facts in the same fact family? 6x3=18, 18/3=6 and 18/6=3.
- WARNING! – When creating fact families, children sometimes get confused by the order of the numbers in the division number sentence. It is tempting to say that the biggest number goes first, but it is more helpful to say that the answer to the multiplication goes first, as this will help your child more in later years when they study fractions, decimals and algebra. E.g. 6 x 12 = 72. The answer to the multiplication is 72, so 72 ÷ 6 = 12 and 72 ÷ 12 = 6

Objective: I know the multiplication and division facts for the 7and 11 times tables

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Use memory tricks – For those hard-to-remember facts, www.multiplication.com has some strange picture stories to help children remember.
- WARNING! – When creating fact families, children sometimes get confused by the order of the numbers in the division number sentence. It is tempting to say that the biggest number goes first, but it is more helpful to say that the answer to the multiplication goes first, as this will help your child more in later years when they study fractions, decimals and algebra. E.g. 7 x 11 = 77. The answer to the multiplication is 77, so 77 ÷ 11 = 7 and 77 ÷ 7 = 11

Objective: I know the multiplication and division facts for the 11- and 12-times table.

- Look for patterns – These times tables are full of patterns for your child to find. How many can they spot? Use your ten times table – Multiply a number by 10 and add the original number (e.g. 7 x 10 + 7 = 70 + 7 = 77) What do you notice?
- What do you already know? – Your child will already know many of these facts from the 2, 3, 4, 5, 6, 8 and 10 times tables. It may be worth practising these again!

Objective: I can recognise decimal equivalents of fractions.

- Play games – Make some cards with pairs of equivalent fractions and decimals. Use these to play the memory game or snap. Or make your own dominoes with fractions on one side and decimals on the other.

Objective: I can multiply and divide single-digit numbers by 10 and 100

- It is tempting to tell children that to multiply by ten or one hundred it is just a case of adding zeroes to the end of a number. This way of thinking, however, can cause problems when they are trying to multiply and divide decimal numbers as the rule does not work for these numbers.
- The best way to understand the process for multiplying by ten or one hundred is to show each digit moving in the place value table (place value shift). This rule also works for decimals. Buy one get three free – If your child knows one fact (e.g. 12 x 4 = 48), can they tell you the other three facts in the same fact family?

YEAR 4

Year 4	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	I can find out what must be added to any 2-digit number to make 100.	I know the multiplication and division facts for the 3,6 and 9 times tables	I know the multiplication and division facts for the 7 and 11 times tables.	I know the multiplication and division facts for the 11 and 12 times table.	I can recognise decimal equivalents of fractions.	I can multiply and divide single-digit numbers by 10 and 100.

52 + ___ = 100

100	
	52

3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
9			9			9			9			9			9		
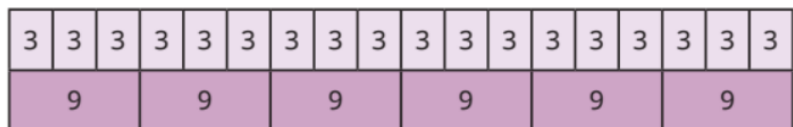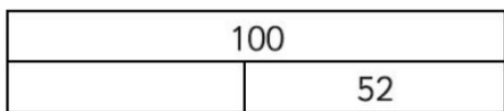
► There are _____ rows of 4 oranges.

There are _____ oranges in total.

_____ × _____ = _____

► The oranges are shared into 9 boxes.

There are _____ oranges in each box.

_____ ÷ _____ = _____

Here are Annie's workings for 9 × 7

9 × 7 = 10 × 7 – 7
= 70 – 7
= 63

Use Annie's method to complete the number sentences.

► 9 × 3 = 10 × ___ – ___   ► 9 × 8 = 10 × ___ – ___

► 9 × 6 = 10 × ___ – ___   ► 9 × 9 = 10 × ___ – ___
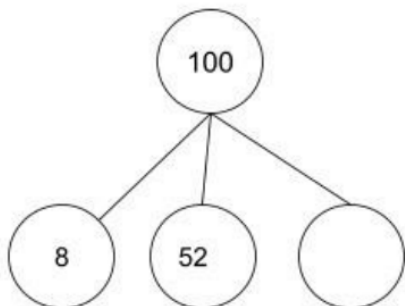
Sam is building the 12 times-table.

1 × 12 = 12   2 × 12 = 24   3 × 12 = 36
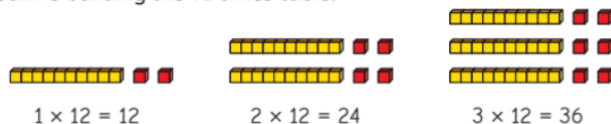
Use base 10 to help you complete the multiplications.

3 × 11 = 33

► 12 × 5 = ___   ► 5 × 12 = ___   ► 48 ÷ 12 = ___   ► 84 ÷ 12 = ___

► 12 × ___ = 120   ► 12 × ___ = 132   ► ___ ÷ 12 = 8   ► ___ = 9 × 12

Year 5

https://ttrockstars.com/

Objective: I know the multiplication and division facts for all times tables up to 12 × 12

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk www.timestables.me.uk and www.conkermaths.org
- Use memory tricks – For those hard-to-remember facts, www.multiplication.com has some strange picture stories to help children remember.
- Speed challenge – Take two packs of playing cards and remove the kings. Turn over two cards and ask your child to multiply the numbers together (Ace = 1, Jack = 11 and Queen = 12). How many questions can they answer correctly in 2 minutes?
- Practise regularly and see if they can beat their highest score.
- Online games – Activities on www.educationcity.com www.conkermaths.org www.timestables.co.uk and www.timestables.me.uk

Objective: I can count forwards or backwards in steps of powers of 10 (e.g. 100,10,000 etc) for any given number up to 1,000,000

- Choose any number and practise counting on in 10s, 100, 1000, 10000s etc.
- Choose any number and practise counting back in 10s, 100s, 1000s, 10000s etc.

Objective: I know all pairs of factors of numbers up to 100 and can identify prime numbers up to 19

- Online games – Activities on www.educationcity.com, www.conkermaths.org, www.timestables.co.uk, www.timestables.me.uk and http://www.fun4thebrain.com/beyondfacts/gcfsketch.html
- Play games - Choose two numbers. Take it in turns to name factors. Who can find the most? NOTE – We do not expect children to know all the factors of a number instantly but would expect them to be able to work them out within a minute or so for numbers under 100
- It is very important that your child uses mathematical vocabulary accurately. Choose a number between 2 and 50. How many correct statements can your child make about this number?
- Make a set of cards for the numbers from 2 to 50. How quickly can your child sort these into prime and composite numbers? How many even prime numbers can they find? How many odd composite numbers can they find? Please note that 1 is not a prime or composite number.

Objective: I know the decimal and percentage equivalents of the fractions ½, ¼, ¾, ⅓, ⅔, tenths and fifths

- Make some cards with equivalent fractions, decimals and percentages. Use these to play the memory game or snap. Or make your own dominoes with fractions on one side and decimals/percentages on the other.

Objective: I know decimal number bonds to 1 and 10.

- Buy one get three free – If your child knows one fact (e.g. 0.7 + 0.3 = 1), can they tell you the other three facts in the same fact family?

- Play Games – There are missing number questions at www.conkermaths.org See how many questions you can answer in 90 seconds.

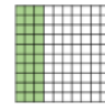Objective: I know all squared numbers up to 12 x 12

- Online games – You can use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Cycling squares – At http://nrich.maths.org/1151 there is a challenge involving square numbers. Can you complete the challenge and then create your own examples?
- Use memory tricks – For those hard-to-remember facts, www.multiplication.com has some strange picture stories to help children remember.

YEAR 5

Year 5	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	I know the multiplication and division facts for all times tables up to 12 × 12.	I can count forwards or backwards in steps of powers of 10 (e.g. 100,10,000 etc) for any given number up to 1,000,000	I know all pairs of factors of numbers up to 100 and can identify prime numbers up to 19.	I know the decimal and percentage equivalents of the fractions ½, ¼, ¾, ⅓, ⅔, tenths and fifths	I know decimal number bonds to 1 and 10.	I know all squared numbers up to 12 x 12

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1000	2000	3000	4000	5000	6000	7000	8000	9000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

$$0.3 = \frac{3}{10} = \frac{30}{100}$$

0.55 + ☐ = 1

1 = 0.32 + ☐

0.11 + 0.5 + ☐ = 1
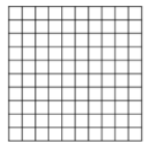
If you have twenty counters, how many different ways of arranging them can you find?
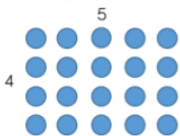
How many factors of twenty have you found by arranging your counters in different arrays?

			8
	3^3	3 × 3 × 3	27
	4^3		
	5^3	5 × 5 × 5	
		6 × 6 × 6	

Use the place value grid to multiply 3.24 by 10, 100 and 1,000

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths

Year 6

https://ttrockstars.com/

Objective: I know the multiplication and division facts for all times tables up to 12 × 12

- Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online.
- You can also use Education City songs and websites www.timestables.co.uk www.timestables.me.uk and www.conkermaths.org
- Use memory tricks – For those hard-to-remember facts, www.multiplication.com has some strange picture stories to help children remember.
- Speed challenge – Take two packs of playing cards and remove the kings. Turn over two cards and ask your child to multiply the numbers together (Ace = 1, Jack = 11 and Queen = 12). How many questions can they answer correctly in 2 minutes?
- Practise regularly and see if they can beat their highest score.
- Online games – Activities on www.educationcity.com www.conkermaths.org www.timestables.co.uk and www.timestables.me.uk

Objective: I can multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3dp

- It is tempting to tell children that to multiply by ten or one hundred it is just a case of adding zeroes to the end of a number. This way of thinking, however, can cause problems when they are trying to multiply and divide decimal numbers as the rule does not work for these numbers.
- The best way to understand the process for multiplying by ten or one hundred is to show each digit moving in the place value table (place value shift). This rule also works for decimals.

Objective: I can derive multiplication and division facts using decimal numbers (e.g. 8 x 0.7 = 5.6)

- Use prior knowledge to create fact families – If your child knows one fact (e.g. 7 x 8 = 56), can they tell you the other three facts in the same fact family? 7 x 0.8 = 5.6, 8 x 0.7 = 5.6, 7 x 0.08 = 0.56 and 8 x 0.07 = 0.56

Objective: I know all previous number bonds including decimals

- Buy one get three free – If your child knows one fact (e.g. 0.7 + 0.3 = 1), can they tell you the other three facts in the same fact family?
- Use number bonds to 10 – How can your number bonds to 10 help you work out number bonds to 100?

Objective: I know the decimal and percentage equivalents of the fractions ½, ¼, ¾, ⅓, ⅔, tenths and fifths

- Make some cards with equivalent fractions, decimals and percentages. Use these to play the memory game or snap. Or make your own dominoes with fractions on one side and decimals/percentages on the other.

Objective: I can identify the properties of 3D shapes

- Children need to know faces, edges and vertices.
- Practise identifying what shapes can be found in the home and identify properties.

YEAR 6

Year 6	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	I know the multiplication and division facts for all times tables up to 12 x 12	I can multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3dp	I can derive multiplication and division facts using decimal numbers (e.g. 8 x 0.7 = 5.6)	I know all previous number bonds including decimals	I know the decimal and percentage equivalents of the fractions ½, ¼, ¾, ⅓, ⅔, tenths and fifths	I can identify the properties of 3D shapes

Related Multiplication facts.

An example might be that if I know that 5 x 7 = 35, then I also know the following related facts.

- 7 x 5 = 35
- 35 ÷ 5 = 7 and 35 ÷ 7 = 5
- 50 x 7 = 350 and 5 x 70 = 350
- 0.5 x 7 = 3.5 and 5 x 0.7 = 3.5
- 0.05 x 7 = 0.35 and 5 x 0.07 = 0.35 and 0.5 x 0.7 = 0.35, etc.

For each of the multiplication facts above, there are also related division facts.
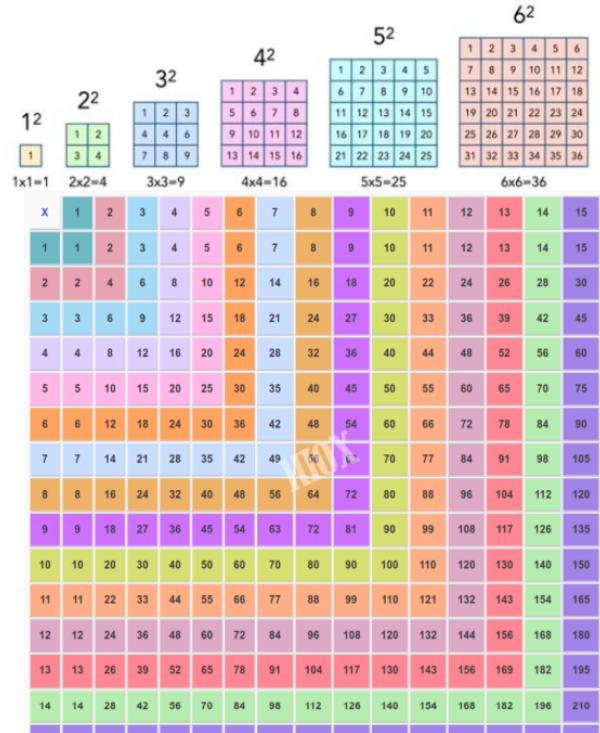
Multiplying and Dividing by 10, 100 and 1000

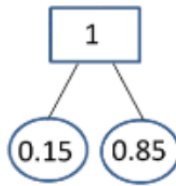| 10 000	1000	100	10	1	•	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

Multiplying

X 10	digits move LEFT **1** space
X 100	digits move LEFT **2** spaces
X 1000	digits move LEFT **3** spaces

←

Dividing

÷ 10	digits move RIGHT **1** space
÷ 100	digits move RIGHT **2** spaces
÷ 1000	digits move RIGHT **3** spaces

→

1

0.15   0.85

0.15 + 0.85 = 1

0.85 + 0.15 = 1

1 − 0.15 = 0.85

1 − 0.85 = 0.15

1^2 1x1=1

2^2 2x2=4

3^2 3x3=9

4^2 4x4=16

5^2 5x5=25

6^2 6x6=36

x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
13	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195
14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210