# 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.

**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

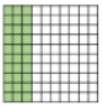
- Online games – You can use Education City songs and websites www.timestables.co.uk and www.timestables.me.uk
- Cycling squares – At http://nrich.maths.org/1151 there is a challenge involving square numbers. Can you complete the challenge and then create your own examples?
- Use memory tricks – For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

# YEAR 5

| | Aut 1 | Aut 2 | Spr 1 | Spr 2 | Sum 1 | Sum 2 |
|---|---|---|---|---|---|---|
| Year 5 | 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, ⅕, ⅖, 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 | |

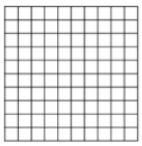


$0.3 = \frac{3}{10} = \frac{30}{100}$

$0.55 + \square = 1$

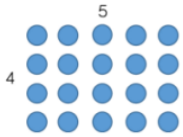
$1 = 0.32 + \square$

$0.11 + 0.5 + \square = 1$



| | | |
|---|---|---|
| | | 8 |
| $3^3$ | $3 \times 3 \times 3$ | 27 |
| $4^3$ | | |
| $5^3$ | $5 \times 5 \times 5$ | |
| | $6 \times 6 \times 6$ | |

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?

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

| Thousands | Hundreds | Tens | Ones | Tenths | Hundredths |
|---|---|---|---|---|---|
| | | | | | |