



WHOLE-SCHOOL MATHEMATICS

KIRFs

KEY INSTANT RECALL FACTS

Nursery → Year 6

$$5 + 5 = 10$$



$$\frac{1}{2} = 0.5 = 50\%$$



EARLY NUMBER

match • subitise • compose



NUMBER FACTS

bonds • doubles • halves



MULTIPLICATIVE FACTS

tables • division • factors



CONNECTED FACTS

fractions • decimals • percentages



FLUENT APPLICATION

recall • connect • calculate efficiently

$$4 \times 6 = 24$$



$$25 \times 4 = 100$$



KNOW IT • RECALL IT • USE IT

Building secure mathematical fluency
through carefully sequenced,
regularly retrieved key facts.

NURSERY • RECEPTION • YEAR 1 • YEAR 2 • YEAR 3 • YEAR 4 • YEAR 5 • YEAR 6



EVERY CHILD.



EVERY CHANCE.

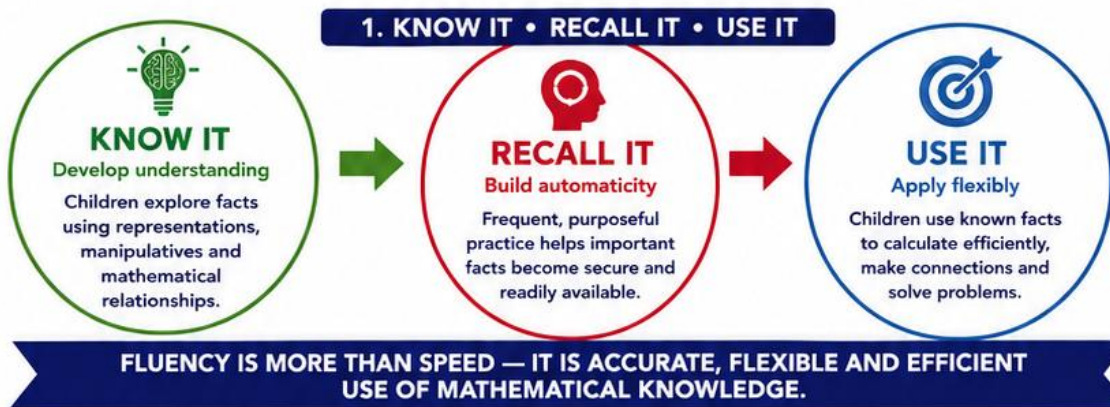


EVERY DAY.

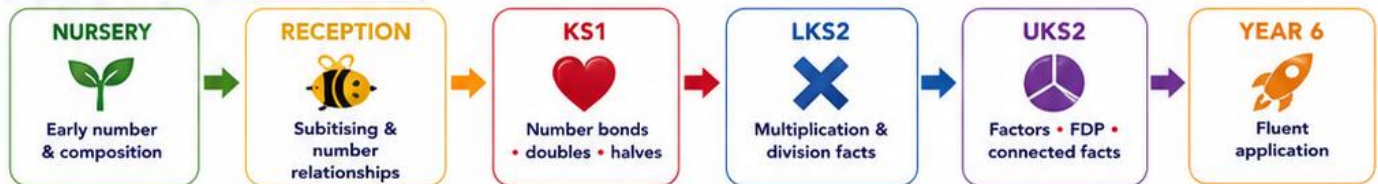
WHAT ARE KIRFs?

Key Instant Recall Facts • Building secure mathematical fluency from Nursery to Year 6

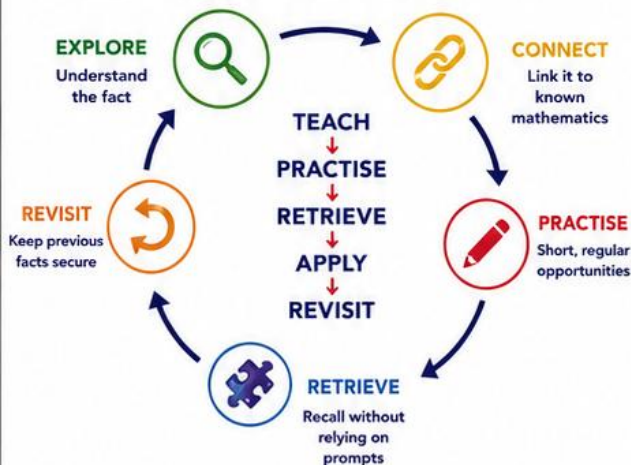
KIRFs are carefully selected mathematical facts and knowledge that pupils learn to recall accurately, confidently and efficiently. Secure recall reduces cognitive load and gives children the foundations they need to reason, solve problems and access new mathematics.



2. ONE CONTINUOUS JOURNEY



3. HOW KIRFs ARE LEARNED



4. ONE FOCUS EACH HALF TERM

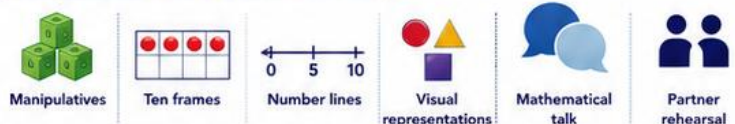


A NEW KIRF DOES NOT MEAN THE PREVIOUS ONE DISAPPEARS.

KIRFs are cumulative.

New facts are explicitly taught and practised while previous KIRFs continue to be retrieved throughout the year.

5. ACCESS FOR EVERY CHILD



WE BUILD UNDERSTANDING BEFORE EXPECTING AUTOMATICITY.

The destination is secure recall — but we do not remove the representations children need while they are developing it.

6. WHY KIRFs MATTER



★ **SECURE FACTS FREE CHILDREN TO THINK ABOUT THE MATHEMATICS THAT MATTERS.** ★

♥ **EVERY CHILD.** • ★ **EVERY CHANCE.** • 🧠 **EVERY DAY.**



WHOLE-SCHOOL KIRF PROGRESSION

NURSERY → YEAR 6

Building secure, connected and increasingly flexible mathematical recall

Each half-termly focus builds on prior learning.

Previously taught KIRFs continue to be retrieved and applied throughout the year.

	AUTUMN 1 	AUTUMN 2 	SPRING 1 	SPRING 2 	SUMMER 1 	SUMMER 2 
NURSERY 	Match and sort objects	Recognise and represent 1 and 2	Recognise, represent and subitise to 3	Recognise and explore composition to 5	Compare groups using more than and fewer than	Recall the composition of numbers to 5
RECEPTION 	Recognise and subitise numbers to 3	Know the composition of numbers to 5	Recall different ways to make 5	Recognise, represent and compare numbers to 10	Recognise, order and find missing numbers to 20	Know doubles and use number facts to solve problems
YEAR 1 	Number bonds for each number to 5	Number bonds for each number to 10	Count forwards / backwards within 50 from any number	Doubles and corresponding halves to 10	Addition and subtraction facts within 10	Tell the time to the hour and half hour
YEAR 2 	Number bonds to 20 + related subtraction facts	Dumber and corresponding halves to 20	2× table + corresponding division facts	10× table + corresponding division facts	5× table + corresponding division facts	Tell the time to the nearest 5 minutes
YEAR 3 	Number bonds to 20 + derive related facts	3× table + corresponding division facts	4× table + corresponding division facts	8× table + corresponding division facts	Key facts about duration of time	Tell and read the time to the nearest minute
YEAR 4 	Number bonds to 100 + derive related facts	6× and 9× tables + division facts	7× and 11× tables + division facts	All × and ÷ facts to 12 × 12 	Multiply and divide whole numbers by 10 and 100	Recognise and recall common equivalent fractions
YEAR 5 	Identify factor pairs	Recognise and recall prime numbers to 20	Recall common fraction / decimal equivalents	Decimal number bonds to 1 and 10	Recall and use common metric conversions	Square numbers to 144 + corresponding square roots
YEAR 6 	Identify common factors of two numbers	Recall and use common fraction, decimal & percentage equivalents	Find fractions of amounts	Find percentages of amounts	Use known facts to calculate efficiently  NEW	Recall and apply key number facts fluently  NEW



★ NEW LEARNING + CONTINUED RETRIEVAL = SECURE FLUENCY ★

 EVERY CHILD.

 EVERY CHANCE.

 EVERY DAY.

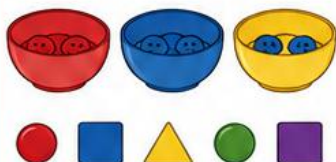
NURSERY KIRFs

Building the Foundations of Number Fluency

In Nursery, KIRFs develop through practical exploration, play, mathematical talk and repeated experiences. The emphasis is on noticing, representing and understanding number relationships rather than rapid recall.

AUTUMN 1

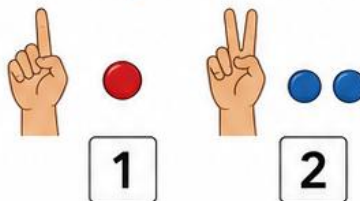
I can match and sort objects.



- matching by a shared attribute
- sorting by colour, size and shape
- noticing similarities and differences
- explaining how objects have been grouped

AUTUMN 2

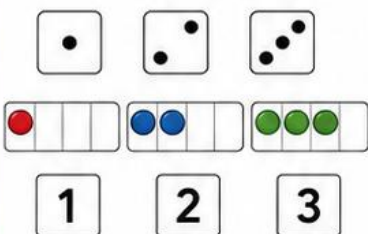
I can recognise and represent 1 and 2.



- subitising 1 and 2
- counting accurately
- recognising the numerals 1 and 2
- representing these quantities in different ways

SPRING 1

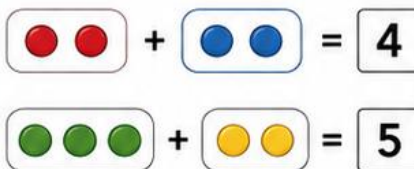
I can recognise, represent and subitise to 3.



- subitising quantities to 3
- 1:1 counting
- recognising numerals
- matching numeral and quantity

SPRING 2

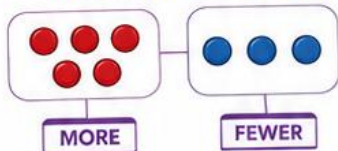
I can recognise and explore the composition of numbers to 5.



- different ways to make 4
- different ways to make 5
- part-whole relationships
- numbers 1-5 in different representations

SUMMER 1

I can compare groups using more than and fewer than.

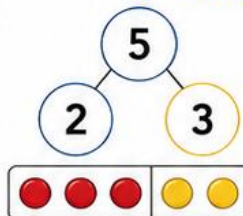


- more than
- fewer than
- one more
- one less

MORE THAN FEWER THAN ONE MORE ONE LESS

SUMMER 2

I can recall the composition of numbers to 5.



- numbers 1-5
- different ways numbers can be composed
- what comes before
- what comes after
- secure recognition and representation

HOW KIRFs LOOK IN NURSERY



Manipulatives



Subitising



Number songs



Mathematical talk



Games



Repeated experiences



UNDERSTANDING FIRST • AUTOMATICITY LATER

Nursery KIRFs are developed through meaningful mathematical experiences – not rote testing.



EVERY CHILD.



EVERY CHANCE.



EVERY DAY.

RECEPTION KIRFs



Developing Secure Number Relationships

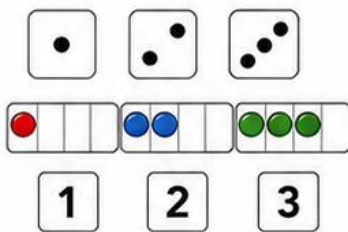
In Reception, children build on their early number understanding through subitising, composition, comparison and increasingly fluent recall.

KIRFs continue to be developed through practical exploration, representations, mathematical talk and purposeful retrieval.



AUTUMN 1

I can recognise and subitise numbers to 3.

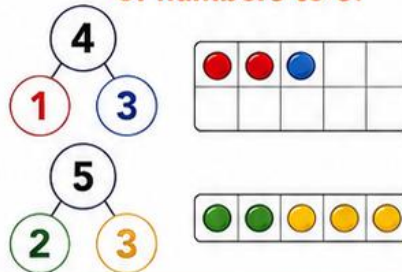


- recognising quantities 1–3
- subitising without counting
- matching numerals and quantities
- finding one more and one less



AUTUMN 2

I know the composition of numbers to 5.

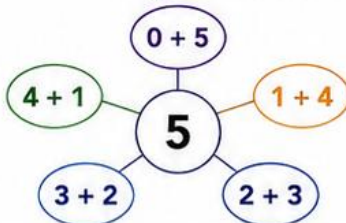


- different ways to make 4
- different ways to make 5
- part-whole relationships
- one more and one less



SPRING 1

I can recall different ways to make 5.

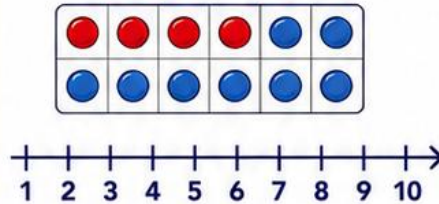


- increasingly secure recall of:
 $5 = 0 + 5$
 $5 = 1 + 4$
 $5 = 2 + 3$
 and the inverse arrangements



SPRING 2

I can recognise, represent and compare numbers to 10.

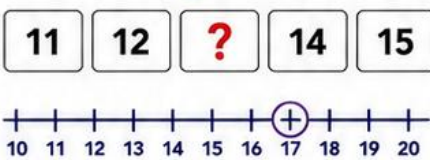


- representing 6, 7 and 8
- representing 9 and 10
- ordering numbers to 10
- comparing within 10
- making 10



SUMMER 1

I can recognise, order and find missing numbers to 20.



- recognising numerals to 20
- ordering numerals to 20
- finding missing numbers
- noticing number patterns
- counting beyond 10



SUMMER 2

I know doubles and can use number facts to solve problems.

$$\begin{array}{c} \boxed{\text{red}} \boxed{\text{red}} + \boxed{\text{blue}} \boxed{\text{blue}} = 4 \\ \boxed{\text{green}} \boxed{\text{green}} + \boxed{\text{green}} \boxed{\text{green}} \boxed{\text{green}} = 6 \end{array}$$

- doubling
- recognising doubles
- sharing and grouping
- using composition and number bonds
- applying known facts to problems

HOW KIRFs LOOK IN RECEPTION



Manipulatives



Subitising



Ten frames



Mathematical talk



Games



Regular retrieval



UNDERSTAND IT • SEE IT • SAY IT • RECALL IT • USE IT

Children move towards fluent recall through secure understanding and repeated meaningful experiences.



RECEPTION → YEAR 1

Secure composition and number relationships to 5 provide the foundation for Year 1 number bonds.



EVERY CHILD.



EVERY CHANCE.



EVERY DAY.



YEAR 1 & YEAR 2 KIRFs



Securing Number Facts & Building Multiplicative Fluency

YEAR 1 – SECURE FOUNDATIONS

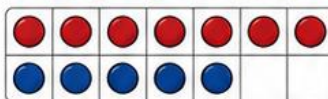
AUTUMN 1

I know number bonds for each number to 5.



AUTUMN 2

I know number bonds for each number to 10.

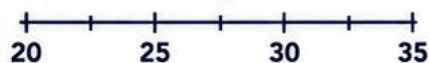


$$7 + 3 = 10$$

SPRING 1

I can count forwards and backwards within 50 from any number.

26 ← 27 ← 28 → 29 → 30



SPRING 2

I know doubles and corresponding halves to 10.

$$4 + 4 = 8$$



half of 8 = 4

SUMMER 1

I can recall addition and subtraction facts within 10.

$$6 + 4 = 10$$

$$4 + 6 = 10$$

$$10 - 6 = 4$$

$$10 - 4 = 6$$

SUMMER 2

I can tell the time to the hour and half hour.



Half past 8



2 o'clock

YEAR 2 – EXTENDING & CONNECTING FACTS

AUTUMN 1

I know number bonds to 20 and related subtraction facts.



$$13 + 7 = 20$$

$$20 - 7 = 13$$

AUTUMN 2

I know doubles and corresponding halves for numbers to 20.

$$8 + 8 = 16$$



half of 16 = 8

SPRING 1

I know the 2 times table and corresponding division facts.

$$6 \times 2 = 12$$



$$12 \div 2 = 6$$

SPRING 2

I know the 10 times table and corresponding division facts.

$$7 \times 10 = 70$$



$$70 \div 10 = 7$$

SUMMER 1

I know the 5 times table and corresponding division facts.

$$8 \times 5 = 40$$



$$40 \div 5 = 8$$

SUMMER 2

I can tell the time to the nearest 5 minutes.



10 minutes past 2

YEAR 1



YEAR 2



READY FOR YEAR 3



KNOW IT • RECALL IT • CONNECT IT • USE IT



EVERY CHILD.



EVERY CHANCE.



EVERY DAY.

YEAR 3 & YEAR 4 KIRFs

Building Multiplication & Division Fluency

YEAR 3 – BUILDING MULTIPLICATIVE FACTS

🍁 AUTUMN 1

I know number bonds to 20 and can use them to derive related facts.

$$\begin{array}{r} 13 + 7 = 20 \\ \downarrow \\ 130 + 70 = 200 \end{array}$$

🍁 AUTUMN 2

I know the 3 times table and corresponding division facts.

$$\begin{array}{r} 4 \times 3 = 12 \\ \longleftrightarrow \\ 12 \div 3 = 4 \end{array}$$

🌸 SPRING 1

I know the 4 times table and corresponding division facts.

$$\begin{array}{r} 6 \times 4 = 24 \\ \longleftrightarrow \\ 24 \div 4 = 6 \end{array}$$

🌸 SPRING 2

I know the 8 times table and corresponding division facts.

$$\begin{array}{r} 5 \times 8 = 40 \\ \longleftrightarrow \\ 40 \div 8 = 5 \end{array}$$

☀️ SUMMER 1

I know key facts about the duration of time.

🕒 60 seconds = 1 minute
🕒 60 minutes = 1 hour
📅 24 hours = 1 day
📅 7 days = 1 week

☀️ SUMMER 2

I can tell and read the time to the nearest minute.



YEAR 4 – SECURING MULTIPLICATIVE FLUENCY

🍁 AUTUMN 1

I know number bonds to 100 and can use them to derive related facts.

$$\begin{array}{r} 65 + 35 = 100 \\ \downarrow \\ 650 + 350 = 1,000 \end{array}$$

🍁 AUTUMN 2

I know the 6 and 9 times tables and corresponding division facts.

$$\begin{array}{r} 7 \times 6 = 42 \longleftrightarrow 42 \div 6 = 7 \\ 5 \times 9 = 45 \longleftrightarrow 45 \div 9 = 5 \end{array}$$

🌸 SPRING 1

I know the 7 and 11 times tables and corresponding division facts.

$$\begin{array}{r} 8 \times 7 = 56 \longleftrightarrow 56 \div 7 = 8 \\ 6 \times 11 = 66 \longleftrightarrow 66 \div 11 = 6 \end{array}$$

🌸 SPRING 2

I KNOW ALL MULTIPLICATION AND DIVISION FACTS TO

$$12 \times 12$$



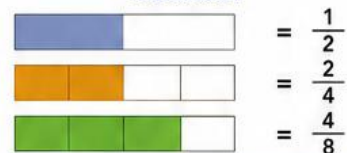
☀️ SUMMER 1

I can multiply and divide whole numbers by 10 and 100.

$$\begin{array}{r} 34 \times 10 = 340 \\ 700 \div 100 = 7 \end{array}$$

☀️ SUMMER 2

I can recognise and recall common equivalent fractions.



YEAR 3

$$3 \times \rightarrow 4 \times \rightarrow 8 \times$$

YEAR 4

$$6 \times \& 9 \times \rightarrow 7 \times \& 11 \times \rightarrow \text{ALL FACTS TO } 12 \times 12$$

READY FOR YEAR 5



USE MULTIPLICATIVE FACTS FLEXIBLY



KNOW IT



RECALL IT



CONNECT IT



USE IT



EVERY CHILD.



EVERY CHANCE.



EVERY DAY.



YEAR 5 & YEAR 6 KIRFs

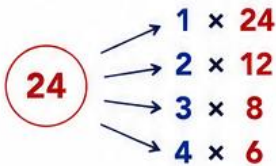


Connecting Facts & Developing Fluent Application

YEAR 5 – CONNECTING MATHEMATICAL FACTS

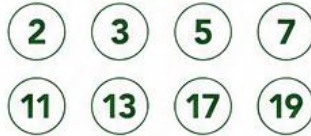
AUTUMN 1

I can identify factor pairs of a number.



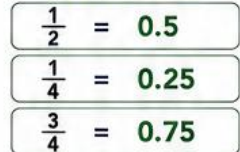
AUTUMN 2

I can recognise and recall prime numbers up to 20.



SPRING 1

I can recall common fraction and decimal equivalents.



SPRING 2

I know decimal number bonds to 1 and 10.

$$0.7 + 0.3 = 1$$

$$6.4 + 3.6 = 10$$

SUMMER 1

I can recall and use common metric conversions.



SUMMER 2

I can recall square numbers to 144 and their corresponding square roots.

$$12^2 = 144 \leftrightarrow \sqrt{144} = 12$$

1, 4, 9, 16, 25, 36, ... 144

YEAR 6 – FLUENT APPLICATION

AUTUMN 1

I can identify common factors of two numbers.

Factors of 12: 1, 2, 3, 4, 6, 12
 Factors of 18: 1, 2, 3, 6, 9, 18

★ Common: 1, 2, 3, 6

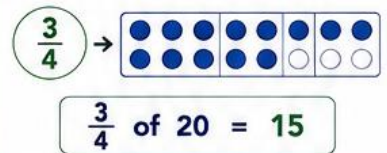
AUTUMN 2

I can recall and use common fraction, decimal and percentage equivalents.

$\frac{1}{2} = 0.5 = 50\%$
 $\frac{1}{4} = 0.25 = 25\%$
 $\frac{3}{4} = 0.75 = 75\%$

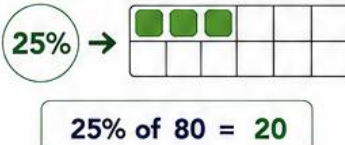
SPRING 1

I can find fractions of amounts.



SPRING 2

I can find percentages of amounts.



SUMMER 1

I can use known facts to calculate efficiently.

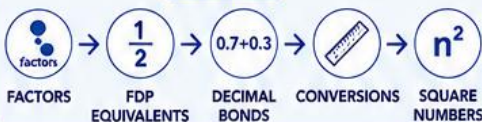


SUMMER 2

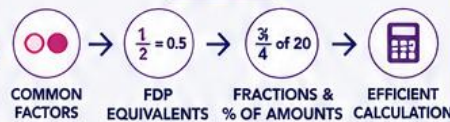
I can recall and apply key number facts fluently.



YEAR 5



YEAR 6



SECONDARY READY



KNOW IT



RECALL IT



CONNECT IT



USE IT

From matching and subitising in Nursery to fluent application in Year 6 – mathematical facts are deliberately built, connected and revisited over time.



EVERY CHILD.



EVERY CHANCE.



EVERY DAY.

TEACH • PRACTISE • RETRIEVE • APPLY

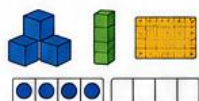
Making KIRFs Stick

KIRFs are most effective when they are explicitly taught, practised little and often, regularly retrieved and deliberately applied within wider mathematics. The half-termly KIRF is the current focus, but previously taught facts continue to be revisited.

THE KIRF LEARNING CYCLE

1 TEACH IT

Build understanding first



- manipulatives
- representations
- mathematical talk
- patterns and relationships
- worked examples

2 PRACTISE IT

Little and often



Short, purposeful opportunities rather than long isolated sessions.

3 RETRIEVE IT

Recall without the answer in front of you



Children regularly retrieve both the current KIRF and previously learned facts.

4 CONNECT IT

Make relationships explicit

$$\begin{array}{r} 6 \times 4 = 24 \\ \downarrow \\ 60 \times 4 = 240 \end{array}$$

or

$$\frac{1}{2} = 0.5 = 50\%$$

5 APPLY IT

Use facts within mathematics



Children use secure facts when calculating, reasoning and solving problems.

6 REVISIT IT

Keep it secure over time



Facts are revisited regularly so they remain secure.

LITTLE & OFTEN

KIRFs should appear through:

- Daily fluency**
Short retrieval opportunities.
- Retrieval practice**
Current + previous KIRFs.
- Oral rehearsal**
Say it, explain it, connect it.
- Games & activities**
Purposeful opportunities to rehearse facts.
- Maths lessons**
Use KIRFs naturally within new learning.
- Home practice**
Simple opportunities to revisit the half-termly focus.

KIRFs ARE PART OF MATHEMATICS – NOT AN EXTRA LESSON.

CURRENT + PREVIOUS



CURRENT KIRF

Main practice focus



PREVIOUS KIRFs

Ongoing retrieval

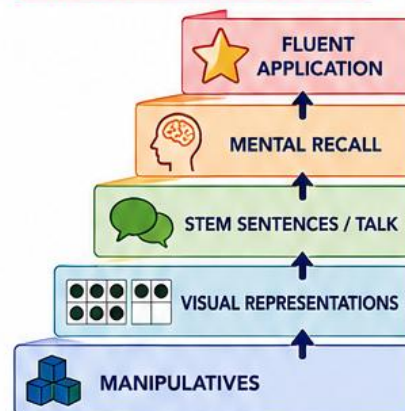


SECURE LONG-TERM FLUENCY



Retrieval should be cumulative. Children continue to encounter previously taught facts throughout the year.

SUPPORT → INDEPENDENCE

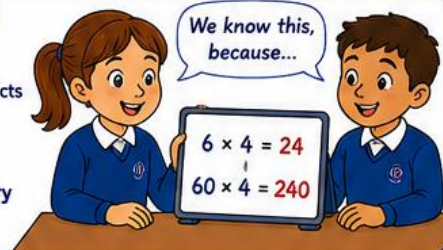


SUPPORT IS REMOVED WHEN UNDERSTANDING IS SECURE – NOT SIMPLY BECAUSE TIME HAS PASSED.

WHAT SHOULD WE SEE?

In classrooms, we should see:

- ✓ the current KIRF known by adults and pupils
- ✓ short and regular retrieval opportunities
- ✓ previous KIRFs revisited
- ✓ representations used where needed
- ✓ children explaining relationships between facts
- ✓ facts applied within calculation and problem solving
- ✓ fluency developed without unnecessary pressure around speed



UNDERSTAND IT



PRACTISE IT



RETRIEVE IT



CONNECT IT



USE IT

The goal is not simply to remember a fact – it is to have that fact available when mathematics demands it.



EVERY CHILD.



EVERY CHANCE.



EVERY DAY.

OUR WHOLE-SCHOOL KIRF APPROACH

Consistent Practice • Cumulative Retrieval • Secure Fluency

Our KIRF progression provides a consistent whole-school approach to developing mathematical fluency. Each half-termly focus is explicitly taught and practised, while previously learned facts continue to be retrieved, connected and applied.

OUR SIX EXPECTATIONS

1

KNOW THE FOCUS



Every class has one identified KIRF focus each half term.

Adults know the current focus and make it visible and meaningful to pupils.

2

TEACH FOR UNDERSTANDING



KIRFs are taught – not simply tested.

Use manipulatives, representations, patterns, relationships and mathematical talk so children understand the facts they are learning.

3

PRACTISE LITTLE & OFTEN



Frequent short practice builds fluency.

KIRFs should be woven naturally through fluency, retrieval and mathematics rather than becoming a separate lesson.

4

RETRIEVAL IS CUMULATIVE



New KIRF + Previous KIRFs

The current half-term focus receives particular attention, but previously taught facts continue to be revisited throughout the year.

5

CONNECT & APPLY



Facts should become useful mathematical knowledge.

Children should be encouraged to use known facts to derive others, make connections and calculate efficiently.

$$6 \times 4 = 24$$



$$60 \times 4 = 240$$

6

SUPPORT EVERY CHILD



The destination is fluency; the route may differ.

Children continue to access manipulatives, visual representations, additional rehearsal and scaffolding where these support secure understanding.

THE HALF-TERMLY RHYTHM

INTRODUCE

Teach & explore



PRACTISE

Little & often



RETRIEVE

Current + previous



APPLY

Use in mathematics



REVIEW

Identify what is secure



THE FOCUS CHANGES • THE RETRIEVAL CONTINUES

CONSISTENCY ACROSS SCHOOL

EYFS

Explore • Represent
Talk • Notice

KIRFs grow from meaningful mathematical experiences.

KS1

Secure • Recall • Connect

Children build increasingly secure additive and early multiplicative facts.

KS2

Recall • Derive • Apply

Children use secure facts increasingly flexibly and efficiently.

OUR FLUENCY PRINCIPLE

FLUENCY IS NOT ABOUT RACING TO AN ANSWER.

It is about being able to:



RECALL accurately



SELECT efficiently



CONNECT intelligently



APPLY flexibly



**SECURE FACTS
GIVE CHILDREN MORE
CAPACITY TO THINK,
REASON AND SOLVE
PROBLEMS.**

EARLY NUMBER

SECURE FACTS

CONNECTED KNOWLEDGE

FLUENT APPLICATION



KNOW IT



RECALL IT



CONNECT IT



USE IT



EVERY CHILD.



EVERY CHANCE.



EVERY DAY.