

OUR APPROACH TO MATHEMATICAL LANGUAGE

Hear it • Say it • See it • Use it • Explain it

At St Stephen's, mathematical language is explicitly taught as an essential part of learning mathematics. Children need opportunities to hear precise vocabulary, rehearse it orally, connect it to representations and use it independently to explain, reason and justify their mathematical thinking.



WHY DOES MATHEMATICAL LANGUAGE MATTER?



THINK

Language helps children organise and develop mathematical thinking.



CONNECT

Vocabulary helps children recognise relationships between mathematical ideas.



EXPLAIN

Precise language enables children to communicate what they notice and understand.

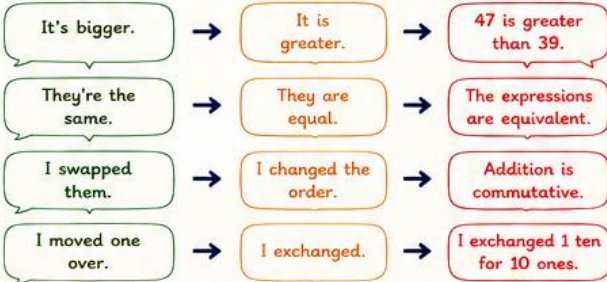


REASON

Children use language to compare, justify, generalise and prove.

★ MATHEMATICAL LANGUAGE IS PART OF THE MATHEMATICS – NOT AN EXTRA. ★

EVERYDAY → MATHEMATICAL → PRECISE



WE BUILD FROM CHILDREN'S LANGUAGE – WE DON'T STAY THERE.

HEAR IT

Teachers model precise mathematical language. Children repeatedly hear vocabulary:

- in context
- alongside representations
- within explanations
- through questioning



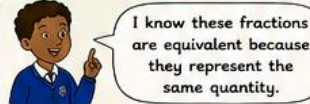
Instead of...

Put this one over here.



We model...

Exchange one ten for ten ones.



I know these fractions are equivalent because they represent the same quantity.

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

SAY IT

Children need opportunities to rehearse language aloud.

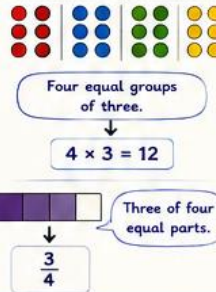
- Partner talk
- My turn/your turn
- Choral response
- Sentence stems
- Repetition
- Explanation



ORAL REHEARSAL COMES BEFORE WE EXPECT POLISHED WRITTEN EXPLANATIONS.

SEE IT

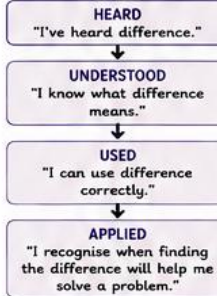
Connect words to mathematical representations.



WORD ↔ REPRESENTATION ↔ SYMBOL
Children should understand what the vocabulary represents mathematically.

USE IT

Vocabulary moves beyond simply recognising a word.



KNOWING A DEFINITION ISN'T THE ENDPOINT.

EXPLAIN IT

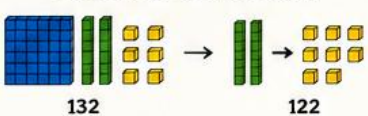
The language of reasoning develops.

- I notice...
- I know because...
- I agree/disagree because...
- This is true because...
- This will always/sometimes/never happen because...
- I can prove this by...
- I can generalise...

VOCABULARY GIVES CHILDREN THE TOOLS TO REASON.

LANGUAGE + REPRESENTATION

Don't teach the word in isolation.



I am exchanging one ten for ten ones. The value has not changed.

✗ DON'T TEACH THE WORD IN ISOLATION.
✓ CONNECT
ACTION + REPRESENTATION + LANGUAGE + SYMBOL.

ACCESS FOR EVERY CHILD

SCAFFOLD THE LANGUAGE – DON'T REMOVE IT
For pupils who need additional support, including SEND and EAL, we use:



while maintaining access to accurate mathematical terminology.

♥ SIMPLIFY THE ROUTE INTO THE LANGUAGE – NOT THE MATHEMATICAL AMBITION.

SENTENCE STEMS

- DESCRIBE "I notice..."
- COMPARE "... is greater/less than ... because..."
- CONNECT "This reminds me of..."
- EXPLAIN "I know ... because..."
- JUSTIFY "This must be true because..."
- GENERALISE "This will always/sometimes/never happen because..."
- PROVE "I can prove this by..."

WHAT WE AVOID

- ✗ Accepting imprecise language indefinitely
- ✗ Introducing vocabulary without mathematical meaning
- ✗ Giving children enormous word lists to memorise
- ✗ Correcting every spoken sentence so often that children stop contributing
- ✗ Using different terminology unnecessarily between classes
- ✗ Replacing mathematical language for pupils with SEND
- ✗ Expecting written reasoning without oral rehearsal
- ✗ "THEY KNOW WHAT I MEAN."

OUR LANGUAGE NON-NEGOTIABLES

- ✓ Vocabulary is explicitly taught
- ✓ Teachers model precise terminology
- ✓ New vocabulary connects to prior language
- ✓ Words are connected to representations and symbols
- ✓ Children rehearse language orally
- ✓ Sentence stems support complete mathematical explanations
- ✓ Vocabulary is revisited through retrieval
- ✓ Staff use agreed mathematical terminology consistently
- ✓ Children increasingly explain without adult prompting
- ✓ All pupils have access to ambitious mathematical language

Why do words matter?



I can think mathematically when I have the right words.



HEAR IT → SAY IT → SEE IT → USE IT → EXPLAIN IT

Precise language supports precise mathematical thinking.

♥ EVERY CHILD. ★ EVERY CHANCE. + EVERY DAY.

From counting and quantity to integers, powers of 10 and increasingly precise place-value reasoning

Number language develops from children's earliest understanding of quantity, counting and comparison. Vocabulary is deliberately revisited and extended so that pupils increasingly describe number, place value and numerical relationships with accuracy and precision.



EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
COUNT, QUANTITY & COMPARE	NUMBER & PLACE	SECURE & CONNECT	EXTEND PLACE VALUE	NEGATIVE NUMBERS & LARGE NUMBERS	DECIMAL PLACE VALUE	PRECISE & GENERALISE
NEW & DEVELOPING LANGUAGE	NEW LANGUAGE	NEW / EXTENDED LANGUAGE	NEW / EXTENDED LANGUAGE	NEW / EXTENDED LANGUAGE	NEW / EXTENDED LANGUAGE	SECURE & APPLY LANGUAGE
- number - count • how many? - altogether - more • fewer • less - same • equal - most • least - one more - one fewer - before • after - first • last • order - zero • one • two... - teen numbers - odd • even	- digit • numeral - tens • ones - place value - represent • partition - greater than - less than - equal to - compare • order - number line - forwards • backwards	- hundreds - hundreds digit - tens digit • ones digit - value - ascending - descending - estimate - approximately - nearest - interval	- thousand • thousands - four-digit number - multiple • interval - round • rounding - nearest 10 - nearest 100 - magnitude	- ten thousand - negative number - positive number - integer - below zero - above zero - increase • decrease - difference - Roman numeral	- decimal - decimal point - tenth • hundredth - thousandth - decimal place - powers of 10 - million - hundred thousand - ten thousand	- integer - positive • negative - digit • value - place value - powers of 10 - interval - magnitude - ascending - descending - round • approximate - inequality
TALK MATHEMATICALLY	TALK MATHEMATICALLY	TALK MATHEMATICALLY	TALK MATHEMATICALLY	TALK MATHEMATICALLY	TALK MATHEMATICALLY	TALK MATHEMATICALLY
"There are 7 altogether." "This group has more." "8 is one more than 7."	"42 has 4 tens and 2 ones." "56 is greater than 49." "I partitioned 37 into 30 and 7."	"347 has 3 hundreds, 4 tens and 7 ones." "The digit 4 has a value of 40." "I know 86 is greater than 68 because..."	"3,472 contains 3 thousands, 4 hundreds, 7 tens and 2 ones." "3,472 rounds to 3,500 to the nearest hundred." "The intervals on this number line represent 100."	"-3 is less than 1." "The temperature decreased from 2°C to -4°C." "Ten hundreds are equivalent to one thousand."	"In 4,375, the digit 7 represents 7 hundredths." "0.6 is greater than 0.56 because 6 tenths is greater than 5 tenths." "The value of each digit becomes ten times smaller as we move one place to the right."	"Multiplying by 100 makes the value of each digit 100 times greater." "The inequality is true because..." "The difference between -4 and 3 is 7." "I can generalise this place-value pattern because..."
CONNECT TO	CONNECT TO	CONNECT TO	CONNECT TO	CONNECT TO	CONNECT TO	CONNECT TO
	$37 = 30 + 7$	347	$3,000 \quad 3,100 \quad 3,200$ $3,300 \quad 3,400 \quad 3,500$	$-5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5$		
NUMBER WORDS REPRESENT QUANTITY.		300 + 40 + 7	THE NUMBER SYSTEM CONTINUES IN POWERS OF TEN.		NOT: "Move the decimal." USE PLACE-VALUE LANGUAGE.	VOCABULARY MOVES FROM NAMING NUMBER → EXPLAINING NUMBER RELATIONSHIPS.

PLACE-VALUE LANGUAGE JOURNEY

EYFS → Y1 → Y2 → Y3 → Y4 → Y5 → Y6

"There are 6." → "36 has 3 tens and 6 ones." → "The digit 3 has a value of 30." → "3,600 contains 36 hundreds." → "Ten hundreds are equivalent to one thousand." → "0.3 represents three tenths." → "The value changes."

347 → 3,600 → 3.2 → 32

COMPARE WITH PRECISION

more / fewer → greater / less → greater than / less than / equal to → difference → inequality → compare magnitude

Symbols are connected to spoken language:

$47 > 39$ → "47 is greater than 39."

NOT: "The crocodile eats the biggest number."

PARTITIONING LANGUAGE

4,372 We can describe 4,372 in many ways:

- 4 thousands + 3 hundreds + 7 tens + 2 ones
- 43 hundreds + 72
- 4,000 + 370 + 2
- 4,372 thousand

LANGUAGE MATTERS

USE

- digit when referring to a symbol within a number
- number for the whole numerical value
- value when describing what a digit represents
- greater than / less than
- exchange
- ten times greater / one tenth of the value

AVOID

- "The 3 means 3." → The digit 3 has a value of 300.
- "Move the digits." → Explain how their place and value change.
- "Add/remove a zero."
- "Crocodile mouth." as the explanation for > and <.

WORD ↔ REPRESENTATION ↔ SYMBOL

Example: 243

"2 hundreds, 4 tens and 3 ones."

$243 = 200 + 40 + 3$

"The digit 4 has a value of 40."

ACCESS FOR EVERY CHILD

Scaffold the route into the language – not the mathematical ambition.

Visuals, Manipulatives, Gesture, Explicit modelling, Repetition, Sentence stems, Partner rehearsal, Widgit-supported vocabulary

All pupils have access to accurate and ambitious mathematical language.

END-POINT LANGUAGE

By the end of Year 6, pupils confidently use number vocabulary to:

- NAME quantities and place values
- REPRESENT numbers precisely
- COMPARE magnitude
- PARTITION numbers flexibly
- EXPLAIN place-value relationships
- GENERALISE patterns
- JUSTIFY comparisons and inequalities

THE WORDS DON'T DISAPPEAR – THE THINKING THEY ENABLE BECOMES MORE SOPHISTICATED.

VOCABULARY IN ACTION

Language supports mathematical thinking, reasoning and problem solving.

"I partitioned 245 into 200, 40 and 5. I know it is greater than 199 because it has one more hundred."

COUNT → REPRESENT → COMPARE → PARTITION → EXPLAIN → GENERALISE

Precise number language supports precise number thinking.

EVERY CHILD. EVERY CHANCE. EVERY DAY.

From combining and separating quantities to precise additive reasoning

Addition and subtraction language develops from children's practical experiences of combining, separating and comparing quantities. Vocabulary is progressively refined so pupils can describe additive structures, explain calculation strategies and reason about relationships with increasing precision.

COMBINE **SEPARATE** **COMPARE** **CONNECT** **CALCULATE** **JUSTIFY**

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
NEW & DEVELOPING LANGUAGE - add • more • altogether - total • make - part • whole - take away • left - fewer • less - difference - one more • one fewer - same • equal TALK MATHEMATICALLY "3 and 2 make 5 altogether." "I took away 2. There are 4 left." "This group has 2 more." CONNECT TO Objects Counters Ten frames Part-whole models Children experience the action before formal notation.	NEW LANGUAGE - addition • subtraction - plus • minus - equals • number - sentence - number bond - sum • total - difference - inverse - count on • count back - partition Symbols are explicitly connected to language. TALK MATHEMATICALLY "8 plus 5 equals 13." "I partitioned 5 into 2 and 3 so I could make 10." "The difference between 9 and 7 is 2." "= means equivalent to - not 'the answer comes next'."	NEW / EXTENDED LANGUAGE - calculate • calculation - operation - commutative - inverse operation - exchange • bridge - estimate • check - efficient - related facts TALK MATHEMATICALLY "Addition is commutative, so $7 + 4 = 4 + 7$." "I bridged through 10." "I can use the inverse operation to check my answer." RELATED FACTS $7 + 5 = 12$ $5 + 7 = 12$ $12 - 5 = 7$ $12 - 7 = 5$	NEW / EXTENDED LANGUAGE - exchange • regroup - column - hundreds • tens • ones - mental strategy - written strategy - estimate - approximately - reasonable TALK MATHEMATICALLY "I exchanged 10 ones for 1 ten." "I aligned the digits according to their place value." "My estimate shows that my answer is reasonable." EXCHANGE CARRY / BORROW We describe what is happening mathematically.	NEW / EXTENDED LANGUAGE - efficient • strategy - derive • derived fact - relationship - adjust • compensate - approximate - difference - inverse - equivalent calculation TALK MATHEMATICALLY "I adjusted 3,999 to 4,000 and compensated by subtracting 1." $3,999 + 246 \rightarrow 4,000 + 246 - 1 = 4,246 - 1 = 4,245$ "Finding the difference is more efficient than counting back." $5,002 - 2,998 = 2,004$ Children begin to explain why a strategy is efficient.	NEW / EXTENDED LANGUAGE - decimal • decimal place - tenths • hundredths - thousandths - multi-step - expression • equation - approximate - adjustment - compensation TALK MATHEMATICALLY "I aligned the numbers according to place value." "£12.75 + £4.80 requires aligned place values." "I estimated before calculating so I could check whether my answer was reasonable." LANGUAGE MATTERS ✗ "Line up the decimal points." ✓ "Align corresponding place values."	SECURE & APPLY LANGUAGE - operation • expression - equation - inverse - commutative - associative - efficient • equivalent - adjustment - compensation - estimate • approximate - derive • justify - generalise TALK MATHEMATICALLY "I selected this strategy because..." "These calculations are equivalent because..." "Addition is commutative, but subtraction is not." "I can generalise this relationship..." NAMING THE OPERATION → EXPLAINING THE RELATIONSHIP.

+ ADDITION LANGUAGE JOURNEY

more → altogether → add / addition → sum / total → commutative → adjust / compensate → efficient strategy

Example: $8 + 5$

"5 more than 8."

"The sum of 8 and 5."

"I partitioned 5 to bridge through 10."

"I can do it an efficient way."

- SUBTRACTION LANGUAGE JOURNEY

TAKE AWAY → **DIFFERENCE** → **MISSING PART**

"13 subtract 5."

"The difference between 13 and 8 is 5."

"8 plus what equals 13?"

SAME OPERATION - DIFFERENT STRUCTURE AND LANGUAGE.

"EQUALS" MATTERS

$7 + 3 = 10$ $6 + 4 = 10$

Both sides of = have the same value.

$10 = 7 + 3 = 6 + 4$

"=" means "is equivalent to" not "the answer comes next."

FACT FAMILY LANGUAGE

VOCABULARY HELPS CHILDREN SEE RELATIONSHIPS.

13

8 5

parts whole inverse commutative related facts

$8 + 5 = 13$
 $5 + 8 = 13$
 $13 - 8 = 5$
 $13 - 5 = 8$

STRATEGY LANGUAGE PROGRESSION

Developing the language to talk about calculation.

count → partition → bridge → exchange

derive → adjust → compensate → select → justify

✗ Instead of: "I just did it in my head."

✓ We say: "I adjusted 99 to 100, added 100 and compensated by subtracting 1."

LANGUAGE MATTERS

USE

- ✓ add / addition
- ✓ sum / total
- ✓ subtract / subtraction
- ✓ difference
- ✓ inverse
- ✓ partition
- ✓ bridge
- ✓ exchange
- ✓ adjust / compensate
- ✓ efficient

AVOID

- ✗ "Carry the one." → "Exchange 10 ones for 1 ten."
- ✗ "Borrow from next door." → "Exchange 1 ten for 10 ones."
- ✗ "The answer comes after =." → "Both sides have the same value."
- ✗ "Just take the smaller number away."

END-POINT LANGUAGE

By the end of Year 6, pupils should confidently use additive vocabulary to:

DESCRIBE additive structures CONNECT addition and subtraction EXPLAIN mental and written strategies COMPARE possible approaches SELECT efficient methods JUSTIFY their choices GENERALISE additive relationships

THE VOCABULARY PROGRESSES FROM DESCRIBING WHAT CHILDREN DO TO EXPLAINING WHY THE MATHEMATICS WORKS.

EXAMPLES OF LANGUAGE IN CONTEXT

$583 + 246$

"I partitioned 246 into $200 + 40 + 6$ so I could add the hundreds first."

$583 + 200 = 783$
 $783 + 40 = 823$
 $823 + 6 = 829$

$5,732 - 2,487$

"I exchanged 1 thousand for 10 hundreds."

$5,732 - 2,487 = 3,245$

$2.45 + 0.78 = 3.23$

"I aligned the decimals so the tenths and hundredths matched."

$2.45 + 0.78 = 3.23$

COMBINE → SEPARATE → CONNECT → CALCULATE → EXPLAIN → JUSTIFY

Precise language turns calculation into mathematical reasoning.

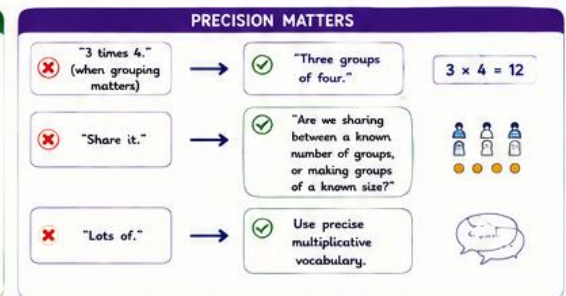
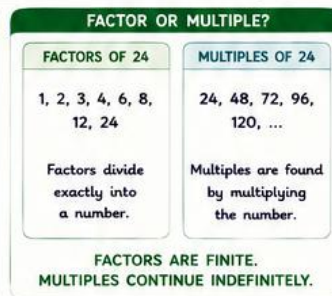
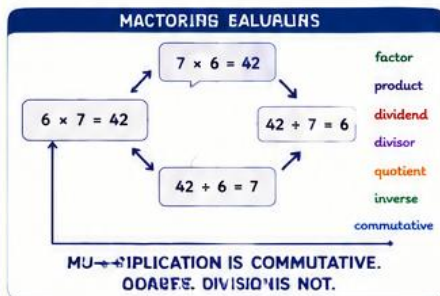
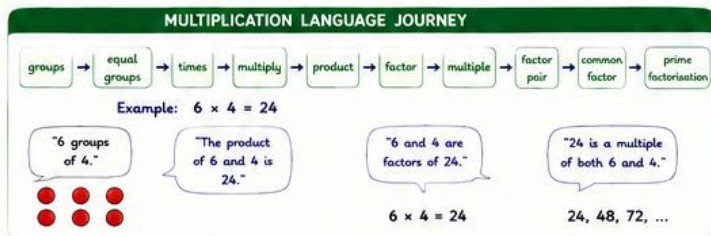
MULTIPLICATION & DIVISION VOCABULARY PROGRESSION

From equal groups and sharing to precise multiplicative reasoning

Multiplication and division language develops from children's practical experiences of equal groups, sharing and repeated quantities. Vocabulary is deliberately revisited and extended so pupils can describe multiplicative structures, connect multiplication and division, derive facts and explain increasingly sophisticated relationships.



GROUP	SHARE	RELATE	RETRIEVE	CALCULATE	GENERALISE	
EYFS EQUAL GROUPS & SHARING - group • equal • same - each • share - share equally - altogether - double • twice - pair • odd • even TALK MATHEMATICALLY "I made 3 equal groups." "There are 2 in each group." "We shared 6 equally between 2." "Double 3 is 6." CONNECT TO Children experience equal groups before formal notation.	YEAR 1 GROUP, SHARE & REPEAT - equal groups • groups of - repeated • repeated addition - array • row • column - count in • multiples - double • half - share equally - group equally TALK MATHEMATICALLY "There are 4 groups of 2." "2 + 2 + 2 + 2 = 8." "The array has 3 rows of 4." "12 can be shared equally into 3 groups." 3 rows of 4	YEAR 2 MULTIPLY, DIVIDE & CONNECT - multiply • multiplication - times • multiplied by - division • divide - divided by • product - grouping • sharing - inverse • commutative - fact family TALK MATHEMATICALLY "The product of 4 and 5 is 20." "Multiplication is commutative." "Division is the inverse of multiplication." FACT FAMILY $4 \times 5 = 20$ $5 \times 4 = 20$ $20 \div 5 = 4$ $20 \div 4 = 5$	YEAR 3 FACTS, MULTIPLES & REMAINDERS - multiple • product - factor • remainder - divisible • derive - derived fact - scaling • groups of - times as many TALK MATHEMATICALLY "32 is a multiple of 4." "4 and 8 are factors of 32." "14 divided by 4 is 3 remainder 2." "I know $4 \times 8 = 32$, so $4 \times 80 = 320$." KNOWN FACT → DERIVED FACT $4 \times 8 = 32$ $\downarrow \times 10$ $4 \times 80 = 320$	YEAR 4 FACTORS & RELATIONSHIPS - factor • factor pair - multiple • common - divisible • quotient - dividend • divisor - square number - distributive law DIVISION ANATOMY $24 \div 6 = 4$ 24 6 4 dividend divisor quotient MULTIPLICATION ANATOMY $6 \times 4 = 24$ 6 4 24 factor factor product "6 and 4 are a factor pair of 24." "24 is divisible by 6." "I used the distributive law to partition the calculation."	YEAR 5 PRIME, SQUARE & CUBE - prime number - composite number - prime factor - common factor - common multiple - square number - cube number - squared • cubed - short multiplication - short division TALK MATHEMATICALLY "13 is prime because it has exactly two factors." "12 is a common multiple of 3 and 4." "6 is a common factor of 18 and 24." "5³ means $5 \times 5 \times 5$." LANGUAGE MATTERS FACTOR ≠ MULTIPLE	YEAR 6 MULTIPLICATIVE REASONING - factor • multiple - common factor - common multiple - prime • composite - prime factorisation - product • quotient - dividend • divisor - scaling • proportional - multiplicative relationship - order of operations - BODMAS / BIDMAS TALK MATHEMATICALLY "I can use common factors to simplify this calculation." "The quotient is 24 because..." "Addition is commutative, but division is not." "I can generalise this pattern because..."



LANGUAGE MATTERS: USE & AVOID

"I made groups." → "The groups are equal." → "I know this multiplication fact." → "I derived this fact from..." → "... is a factor because..." → "... is divisible by ... because..." → "This relationship is multiplicative because..."

$3 \times 4 = 12$ $4 \times 3 = 12$ $24 \div 6 = 4$

✗ "Carry the one." → Exchange 10 ones for 1 ten.
✗ "Borrow from next door." → Exchange 1 ten for 10 ones.
✗ "The answer comes after =." → Both sides have the same value.
✗ "Bus stop method." → Short division.
✗ "Add a zero / Take off a zero." → Explain the place-value relationship.

END-POINT LANGUAGE

By the end of Year 6, pupils should confidently use multiplicative vocabulary to:

DESCRIBE multiplicative structures

DISTINGUISH sharing and grouping

CONNECT multiplication and division

IDENTIFY factors and multiples

DERIVE facts from known relationships

EXPLAIN written and mental strategies

JUSTIFY efficient choices

GENERALISE multiplicative relationships

USE

- ✓ equal groups
- ✓ groups of
- ✓ multiply / multiplication
- ✓ divide / division
- ✓ factor
- ✓ multiple
- ✓ product
- ✓ dividend
- ✓ divisor
- ✓ quotient
- ✓ remainder
- ✓ inverse

AVOID AS THE EXPLANATION

- ✗ "Carry the one." → Exchange 10 ones for 1 ten.
- ✗ "Borrow from next door." → Exchange 1 ten for 10 ones.
- ✗ "The answer comes after =." → Both sides have the same value.
- ✗ "Bus stop method."
- ✗ "Add a zero / Take off a zero." → Explain the place-value relationship.

THE VOCABULARY PROGRESSES FROM TALKING ABOUT EQUAL GROUPS TO REASONING PRECISELY ABOUT MULTIPlicative STRUCTURE.

GROUP → SHARE → RELATE → RETRIEVE → CALCULATE → GENERALISE
Precise language reveals multiplicative relationships.

FRACTIONS, DECIMALS & PERCENTAGES VOCABULARY PROGRESSION

PAGE 6

From whole and part to equivalence, conversion and proportional reasoning

Fractional language develops from children's early experiences of whole, part and equal sharing. Vocabulary is progressively extended to fractions, decimal place value and percentages so pupils can describe, compare and reason about quantities using increasingly precise mathematical language.



WHOLE	PART	EQUAL	REPRESENT	EQUIVALENT	CONNECT	REASON
EYFS WHOLE, PART & EQUAL SHARING NEW & DEVELOPING LANGUAGE - whole - part - equal • same - share - share equally - half • halves - two equal parts - fair - equal groups TALK MATHEMATICALLY "This is the whole." "I split it into two equal parts." "Each person has the same amount." CONNECT TO Real objects Counters Shapes Sharing Ten frames EQUAL PARTS ARE THE FOUNDATION OF FRACTIONAL THINKING.	YEAR 1 HALVES & QUARTERS NEW / EXTENDED LANGUAGE - fraction - half • one half - halves - quarter • one quarter - quarters - equal parts - whole - quantity $\frac{1}{2}$ = one half $\frac{1}{4}$ = one quarter TALK MATHEMATICALLY "One half is one of two equal parts." "One quarter is one of four equal parts." "Two halves make one whole." THE PARTS MUST BE EQUAL.	YEAR 2 FRACTION LANGUAGE NEW / EXTENDED LANGUAGE - third • one third - three quarters - numerator - denominator - fraction of a quantity - equivalent - unit fraction - non-unit fraction $\frac{3}{4}$ 3 = numerator (how many parts) 4 = denominator (how many equal parts make whole) TALK MATHEMATICALLY "The denominator tells me how many equal parts make the whole." "The numerator tells me how many of those parts we have." "Two quarters are equivalent to one half."	YEAR 3 TENTHS & EQUIVALENCE NEW / EXTENDED LANGUAGE - tenth • tenths - equivalent fraction - compare • order - number line - unit fraction - non-unit fraction - numerator - denominator - whole TALK MATHEMATICALLY "Three tenths means three of ten equal parts." "2/4 is equivalent to 1/2 because they represent the same quantity." "5/10 is positioned at the same point as 1/2 on the number line." EQUIVALENT = SAME VALUE, DIFFERENT REPRESENTATION	YEAR 4 HUNDREDTHS & DECIMAL CONNECTIONS NEW / EXTENDED LANGUAGE - hundredth • hundredths - decimal • decimal point - decimal place - tenth • hundredth - equivalent decimal - improper fraction - mixed number $\frac{25}{100} = 0.25$ $\frac{1}{2} = 0.5$ TALK MATHEMATICALLY "0.25 represents twenty-five hundredths." "One half and five tenths are equivalent." "The decimal point separates the ones from the fractional place values." DECIMAL NUMBERS ARE NUMBERS – NOT 'NUMBERS WITH A DOT'.	YEAR 5 PERCENTAGES & CONVERSION NEW / EXTENDED LANGUAGE - percentage • percent - per cent • out of 100 - thousandth • thousandths - mixed number - improper fraction - equivalent - convert • conversion - common denominator $\frac{1}{2} = 0.5 = 50\%$ $\frac{1}{4} = 0.25 = 25\%$ $\frac{3}{4} = 0.75 = 75\%$ TALK MATHEMATICALLY "Percent means out of one hundred." "25% is equivalent to 1/4." "0.75 is equivalent to 75/100 and therefore 75%." "I converted to a common representation so I could compare the values." F ⇌ D ⇌ P CONNECTED REPRESENTATIONS	YEAR 6 PRECISE FDP REASONING SECURE & APPLY LANGUAGE - equivalent • simplify - simplest form - common denominator - common numerator - convert • conversion - percentage • decimal - improper fraction - mixed number - recurring decimal - proportion • proportional - relationship TALK MATHEMATICALLY "I simplified the fraction by dividing the numerator and denominator by a common factor." "3/4, 0.75 and 75% are equivalent representations of the same quantity." "I converted to a common representation so I could compare the values." "The relationship is proportional because..." NAMING FRACTIONS → REASONING ACROSS REPRESENTATIONS

FRACTION LANGUAGE JOURNEY	DECIMAL LANGUAGE JOURNEY	PERCENTAGE LANGUAGE JOURNEY								
part → equal part → half / quarter → fraction → numerator / denominator unit / non-unit fraction → equivalent → improper fraction / mixed number → simplify → common denominator part of a whole → two equal parts → one half → two quarters → two quarters = one half THE LANGUAGE BECOMES MORE PRECISE AS THE MATHEMATICS BECOMES MORE COMPLEX.	whole → tenth → hundredth → thousandth decimal → decimal point → decimal place → equivalent decimal <table border="1"> <tr> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> <th>Thousandths</th> </tr> <tr> <td>3</td> <td>4</td> <td>7</td> <td>5</td> </tr> </table> 3.475 "3 ones, 4 tenths, 7 hundredths and 5 thousandths." (We name the place value, not the digits.)	Ones	Tenths	Hundredths	Thousandths	3	4	7	5	out of 100 → fraction → decimal → percentage 25 out of 100 → $\frac{25}{100}$ → 0.25 → 25% SAME VALUE – FOUR WAYS TO DESCRIBE IT.
Ones	Tenths	Hundredths	Thousandths							
3	4	7	5							

FRACTION ANATOMY	SAME QUANTITY – DIFFERENT LANGUAGE	COMPARISON LANGUAGE	FACTOR OR MULTIPLE?
3 → NUMERATOR (top) How many equal parts we have. 4 → DENOMINATOR (bottom) How many equal parts make the whole. NOT: "Top number / bottom number." USE: "Numerator / Denominator."	$\frac{3}{4} \Leftrightarrow 0.75 \Leftrightarrow 75\%$ Three quarters. Seventy-five hundredths. Seventy-five percent.	more / less → larger / smaller part → greater than / less than equivalent → compare → common denominator → common representation Example: $0.6 > 0.56$ "Six tenths is greater than five tenths and six hundredths."	FACTORS OF 24 1, 2, 3, 4, 6, 8, 12, 24 Factors divide exactly into a number. MULTIPLES OF 24 24, 48, 72, 96, 120... Multiples are found by multiplying the number. FACTORS ARE FINITE. MULTIPLES CONTINUE INDEFINITELY.

LANGUAGE MATTERS: USE & AVOID	REASONING LANGUAGE PROGRESSION	END-POINT LANGUAGE
USE ✓ whole / part ✓ equal parts ✓ fraction ✓ numerator / denominator ✓ unit / non-unit fraction ✓ tenths / hundredth / thousandth ✓ decimal point ✓ percent / percentage ✓ convert / simplify AVOID ✗ "Top number / bottom number." ✗ "The little number after the dot." ✗ "Move the decimal point." ✗ "Add a zero." ✗ "Bigger denominator = bigger fraction." ✗ "Numbers with a dot." CONNECT LANGUAGE TO QUANTITY, PLACE VALUE AND REPRESENTATION.	"They are equal." "The parts are equal." "This is one quarter of the whole." "These fractions are equivalent." "I know 0.5 is five tenths." "50% is equivalent to one half." "I converted them to a common representation because..." "I can generalize this proportional because..." My language helps me think mathematically.	By the end of Year 6, pupils should confidently: ✓ DESCRIBE fractional quantities ✓ IDENTIFY numerator and denominator ✓ COMPARE fractions and decimals precisely ✓ RECOGNISE equivalence ✓ CONVERT between representations ✓ SIMPLIFY fractions ✓ CONNECT fractions, decimals and percentages ✓ JUSTIFY comparisons ✓ REASON proportionally 0.625 62.5% THE LANGUAGE PROGRESSES FROM DESCRIBING PARTS OF A WHOLE TO REASONING FLEXIBLY ACROSS EQUIVALENT REPRESENTATIONS.

WHOLE → PART → EQUAL → REPRESENT → EQUIVALENT → CONNECT → REASON
 Different representations. Same quantity. Connected mathematical language.

♥ EVERY CHILD.

★ EVERY CHANCE.

100 EVERY DAY.

MEASUREMENT VOCABULARY PROGRESSION

From comparing everyday measures to precise measurement, conversion and calculation

Measurement language develops from children's practical experiences of comparing size, length, mass, capacity and time. Vocabulary is progressively refined as pupils learn to measure accurately, select appropriate units, convert between measures and reason about perimeter, area, volume and increasingly complex relationships.



EYFS COMPARE & DESCRIBE NEW & DEVELOPING LANGUAGE • big • small • bigger • smaller • long • short • longer • shorter • tall • taller • heavy • light • heavier • lighter • full • empty • nearly full • nearly empty • holds more • holds less • before • after • first • next • last • yesterday • today • tomorrow TALK MATHEMATICALLY "This tower is taller." "This container holds more." "The bag is heavier than the box." CONNECT TO Direct comparison Practical objects Sand / water Balance scales Daily routines CHILDREN DESCRIBE AND COMPARE BEFORE THEY FORMALLY MEASURE.	YEAR 1 MEASURE & RECORD NEW / EXTENDED LANGUAGE • measure • measurement • length • height • mass • weight • capacity • volume • time • unit • ruler • scales • container • centimetre (cm) • metre (m) • gram (g) • kilogram (kg) • litre (l) • millilitre (ml) TIME • hour • minute • second • o'clock • half past MONEY • pence • pound • £ • p TALK MATHEMATICALLY "The pencil is 14 centimetres long." "The bottle holds 1 litre." "The mass is 500 grams." IMPORTANT: NUMBER = UNIT Not just "It is 14."	YEAR 2 SELECT, COMPARE & ESTIMATE NEW / EXTENDED LANGUAGE • standard unit • estimate • approximately • accurately • compare • difference • interval • quarter past • quarter to • duration • temperature • degrees Celsius TALK MATHEMATICALLY "I estimate the table is about 1 metre long." "The difference in mass is 200 grams." "The lesson lasts for 45 minutes." "The temperature is 8 degrees Celsius." REMEMBER: ESTIMATE ≠ GUESS An estimate is a reasoned approximation.	YEAR 3 PERIMETER & UNIT RELATIONSHIPS NEW / EXTENDED LANGUAGE • perimeter • distance • millimetre (mm) • kilometre (km) • equivalent measure • convert • conversion • duration • 12-hour clock • 24-hour clock UNIT RELATIONSHIPS 10 mm = 1 cm 100 cm = 1 m 1,000 m = 1 km TALK MATHEMATICALLY "Perimeter is the distance around a 2D shape." "3 metres is equivalent to 300 centimetres." "I converted the measurement into the same unit before comparing."	YEAR 4 AREA & CONVERSION NEW / EXTENDED LANGUAGE • area • square unit • square centimetre (cm²) • square metre (m²) • rectilinear • convert • conversion • equivalent • approximately • scale • interval PERIMETER vs AREA PERIMETER Distance around AREA Amount of surface covered TALK MATHEMATICALLY "The perimeter is 26 centimetres." "The area is 24 square centimetres." "I converted 2.5 metres to 250 centimetres." IMPORTANT: cm ≠ cm² The unit tells us what has been measured.	YEAR 5 VOLUME & COMPOUND MEASUREMENT NEW / EXTENDED LANGUAGE • volume • cubic unit • cubic centimetre (cm³) • cubic metre (m³) • capacity • metric • imperial • approximate • equivalent • conversion factor • timetable • elapsed time CAPACITY How much a container can hold VOLUME The amount of 3D space occupied TALK MATHEMATICALLY "The cuboid has a volume of 60 cubic centimetres." "One inch is approximately relationship to calculate..."	YEAR 6 PRECISE MEASUREMENT REASONING SECURE & APPLY LANGUAGE • perimeter • area • volume • formula • conversion • metric • imperial • scale • ratio • rate • compound measure • approximately • precision • degree of accuracy TALK MATHEMATICALLY "I used the formula to calculate the area." "Measurements must be expressed in the same unit before calculating." "This answer is reasonable because..." "The scale factor changes the lengths by..." END POINT: DESCRIBING MEASURE → REASONING WITH MEASURE
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LENGTH LANGUAGE JOURNEY long / short → longer / shorter → length / height → cm / m → mm / km → equivalent measure → precision Example: "It is 12 cm longer." "The difference in length is 0.12 m."	MASS LANGUAGE PATHWAY heavy / light → heavier / lighter → mass → g / kg	CAPACITY LANGUAGE PATHWAY full / empty → holds more / less → capacity → ml / l → convert / equivalent
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TIME LANGUAGE JOURNEY before / after → o'clock / half past → quarter past / quarter to → minutes / hours → duration → 12-hour / 24-hour 09:15 12-hour 21:15 24-hour TIME IS DIFFERENT • 60 seconds = 1 minute • 60 minutes = 1 hour • 24 hours = 1 day It doesn't follow our normal base-10 place value structure.	PERIMETER → AREA → VOLUME PERIMETER 1-dimensional measure Distance around Units: cm, m AREA 2-dimensional measure Surface covered Units: cm², m² VOLUME 3-dimensional measure Space occupied Units: cm³, m³ THE LANGUAGE AND THE UNIT TELL US WHAT IS BEING MEASURED.	CONVERSION LANGUAGE 1 m = 100 cm NOT: "Add two zeros." USE: "1 metre is equivalent to one hundred centimetres." 2.4 m = 240 cm "2.4 metres is equivalent to 240 centimetres."
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MONEY LANGUAGE coin / note → pence / pound → £ / p → cost / price → change / total "£3.50 is equivalent to 350 pence." £1 = 100p Same value - different notation.	FRACTION, DECIMAL & PERCENTAGE CONNECTION FRACTION Three quarters DECIMAL 0.75 Seventy-five hundredths PERCENTAGE 75% Seventy-five percent SAME QUANTITY - DIFFERENT REPRESENTATION. THE VALUE DOES NOT CHANGE.	UNIT PRECISION MATTERS NOT PRECISE ✗ "It is long." ✗ "It weighs 5." ✗ "It holds some." ✗ "It is cold." PRECISE LANGUAGE ✓ "It is 32 centimetres long." ✓ "It has a mass of 2 kilograms." ✓ "It holds 250 millilitres." ✓ "The temperature is 6°C."	LANGUAGE MATTERS: USE & AVOID USE ✓ mass, capacity, volume ✓ length / height ✓ unit ✓ estimate / approximately ✓ equivalent ✓ convert / conversion ✓ perimeter / area / volume ✓ square / cubic units ✓ duration / elapsed time AVOID ✗ "Add zeros." ✗ "Remove zeros." ✗ "It's about this big." (use a unit) ✗ Leaving out the unit ✗ cm for area ✗ kg for weight (instead of mass)
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REASONING LANGUAGE PROGRESSION "It's bigger." "It is longer." "It is 12 cm long." "I estimate it is about 1 metre." "My answer is reasonable because..." "I converted the measurement." "300 cm is equivalent to 3 m." "The perimeter is 20 cm." Strong language builds strong mathematical thinking.	END-POINT LANGUAGE By the end of Year 6, pupils should confidently: ✓ describe and compare measures ✓ select appropriate units ✓ estimate accurately ✓ measure accurately ✓ distinguish perimeter, area, capacity and volume
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COMPARE → MEASURE → UNIT → ESTIMATE → CONVERT → CALCULATE → REASON
Measure it. Name it. Quantify it. Reason with it.
EVERY CHILD. EVERY CHANCE. EVERY DAY.

From describing shape and position to precise geometric reasoning

Geometrical language develops from children's practical experiences of shape, space, position and movement. Vocabulary is progressively refined so pupils can identify properties, describe relationships, classify shapes and reason precisely about angles, coordinates, symmetry and transformations.

NOTICE	NAME	DESCRIBE	COMPARE	CLASSIFY	POSITION	REASON
EYFS SHAPE, SPACE & POSITION NEW & DEVELOPING LANGUAGE - shape • same • different - side • corner • straight - curved • flat • round - solid • pattern • turn - forwards • backwards - above • below • under - over • next to • between - behind • in front - inside • outside TALK MATHEMATICALLY "The triangle has 3 sides." "The ball is under the table." "This shape has a curved surface." CONNECT TO Construction Shape sorting Pattern Movement Everyday objects CHILDREN EXPERIENCE SHAPE AND SPACE BEFORE FORMAL DEFINITIONS.	YEAR 1 NAME & DESCRIBE NEW / EXTENDED LANGUAGE 2D • 3D - two-dimensional - three-dimensional - side • vertex • vertices - face • edge • surface - curved • straight - position • direction - whole turn • half turn - quarter turn TALK MATHEMATICALLY "A triangle has 3 sides and 3 vertices." "A cube has 6 faces." "I made a quarter turn clockwise." REMEMBER CORNERS → VERTICES	YEAR 2 PROPERTIES & SYMMETRY NEW / EXTENDED LANGUAGE - property • properties - vertical • horizontal - symmetry - line of symmetry - clockwise - anticlockwise - right angle - rotation • sequence - pentagon • hexagon - octagon • prism TALK MATHEMATICALLY "This shape has one vertical line of symmetry." "I rotated clockwise through a quarter turn." "A square has four right angles." EXAMPLE LINES OF SYMMETRY	YEAR 3 ANGLES & LINES NEW / EXTENDED LANGUAGE - angle • right angle - acute • obtuse - horizontal • vertical - parallel • perpendicular - orientation • turn - degrees - polygon • quadrilateral TALK MATHEMATICALLY "These lines are perpendicular because they meet at a right angle." "These sides are parallel." "This angle is greater than a right angle." SYMBOLS = parallel ⊥ = perpendicular	YEAR 4 CLASSIFY & COORDINATE NEW / EXTENDED LANGUAGE - quadrilateral • triangle - classify • criteria - regular • irregular - acute • obtuse - coordinate • axis - x-axis • y-axis - quadrant • translation - square • rectangle - parallelogram • rhombus - trapezium • kite - equilateral • isosceles - scalene TALK MATHEMATICALLY "I classified the shape as a rhombus because..." "The coordinate is (4, 2)." "The shape has been translated 3 units to the right." EXAMPLE COORDINATE Point (4, 2)	YEAR 5 ANGLES & GEOMETRIC RELATIONSHIPS NEW / EXTENDED LANGUAGE - degrees • protractor - reflex angle - straight-line angle - full turn • interior angle - regular polygon - irregular polygon - diagonal - parallel • perpendicular TALK MATHEMATICALLY "This is a reflex angle because it is greater than 180° and less than 360°." "Angles on a straight line total 180°." "I can calculate the missing angle because..." TURN MEASURES $\frac{1}{4}$ turn = 90° $\frac{1}{2}$ turn = 180° $\frac{3}{4}$ turn = 270° full turn = 360°	YEAR 6 PRECISE GEOMETRIC REASONING SECURE & APPLY LANGUAGE - radius • diameter - circumference • centre - coordinate plane - four quadrants - translation • reflection - rotation • transformation - vertically opposite angles - interior angles - deduce • calculate - justify • reason TALK MATHEMATICALLY "The diameter is twice the radius." "The point lies in the second quadrant." "The shape has been reflected in the y-axis." END POINT: NAMING SHAPES → REASONING ABOUT GEOMETRIC RELATIONSHIPS

SHAPE LANGUAGE JOURNEY shape → 2D / 3D → side/face/edge/vertex → property → polygon/quadrilateral → regular/irregular → classify → justify Example progression: "It's a square." → "It has four equal sides and four right angles." → "It is a square because it is a quadrilateral with four equal sides and four right angles." NAMING → DESCRIBING → DEFINING → CLASSIFYING	ANGLE LANGUAGE JOURNEY turn → quarter turn → right angle → acute / obtuse → degrees reflex angle → angle relationships AN ANGLE DESCRIBES AN AMOUNT OF TURN - NOT THE LENGTH OF THE LINES.	POSITION & DIRECTION JOURNEY above / below → left / right → forwards / backwards clockwise / anticlockwise → turn → coordinate axis (x / y) → quadrant → translation / reflection transformation
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COORDINATE LANGUAGE Point {4, 3} x-coordinate = 4 (along the corridor) y-coordinate = 3 (up the stairs) Year 6: Four Quadrants Quadrant II (-, +) Quadrant I (+, +) Quadrant III (-, -) Quadrant IV (+, -)	2D OR 3D? 2D SHAPES NOT: "A circle has one side." BETTER: "A circle has a curved boundary." 3D SHAPES NOT: "A cube has 12 sides." BETTER: "A cube has 12 edges."	CLASSIFYING SHAPES QUADRILATERAL Parallelogram → Rectangle → Square Trapezium → Rhombus → Square Kite Square A SQUARE IS ALSO A RECTANGLE. Classification is based on properties, not what a shape "looks like".	TRANSFORMATION LANGUAGE TRANSLATION Slides REFLECTION Flips across a mirror line ROTATION Turns around a point THE SHAPE CHANGES POSITION OR ORIENTATION - NOT ITS SIZE OR PROPERTIES.
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GEOMETRIC REASONING LANGUAGE "It looks like..." → "It has..." → "I notice..." → "The properties are..." → "I can classify it as..." → "It must be because..." "It cannot be because..." → "I can deduce..."	LANGUAGE MATTERS: USE & AVOID USE ✓ side / vertex / vertices ✓ face / edge ✓ property ✓ parallel / perpendicular ✓ acute / obtuse / reflex ✓ degrees ✓ coordinate / axis ✓ translate / reflect / rotate ✓ regular / irregular ✓ classify AVOID ✗ "Diamond" → rhombus (where appropriate) ✗ "Slanting line" → describe its relationship ✗ "Corners" indefinitely → develop vertex / vertices ✗ "A square isn't a rectangle." ✗ "A cube has 12 sides." ✗ Defining shapes purely by appearance.	END-POINT LANGUAGE By the end of Year 6, pupils should confidently: ★ name shapes accurately ★ describe properties precisely ★ compare geometric features ★ classify using mathematical criteria ★ describe position and movement ★ identify and calculate angles ★ use coordinates accurately ★ describe transformations ★ justify classifications ★ deduce geometric relationships
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NOTICE → NAME → DESCRIBE → COMPARE → CLASSIFY → POSITION → REASON

♥ EVERY CHILD.

★ EVERY CHANCE.

▲ EVERY DAY.

From sorting, patterns and relationships to data, proportion and algebraic reasoning

Children develop the language of statistics, ratio and algebra through early experiences of sorting, comparing, recognising patterns and describing relationships. As they progress through school, vocabulary becomes increasingly precise, enabling pupils to interpret data, reason proportionally and express mathematical relationships using symbols and generalisations.

SORT **DESCRIBE** **INTERPRET** **RELATE** **GENERALISE** **REPRESENT** **REASON**

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Sort, Match & Notice NEW & DEVELOPING LANGUAGE • same • different • match • sort • group • set • pattern • repeat • next • before • after • more • fewer • most • least • altogether TALK MATHEMATICALLY "I sorted them by colour." "This group has more." "The pattern repeats." "I know what comes next because..." CONNECT TO Objects Sorting hoops Simple patterns Collections Daily routines NOTICING AND DESCRIBING PATTERN IS AN EARLY FORM OF ALGEBRAIC THINKING.	Sort, Count & Represent NEW / EXTENDED LANGUAGE • category • classify • sort • represent • information • data • tally • total • pattern • sequence • rule TALK MATHEMATICALLY "I classified the objects by shape." "There are 8 in this category." "The sequence increases by 2 each time." EXAMPLE PATTERN ●●●●●●●● "The pattern repeats." CHILDREN MOVE FROM NOTICING A PATTERN TO DESCRIBING ITS RULE.	Data & Patterns NEW / EXTENDED LANGUAGE • data • category • tally chart • table • pictogram • block diagram • key • scale • most popular • least popular • difference • sequence TALK MATHEMATICALLY "The pictogram represents 12 children." "The key shows that one symbol represents two children." "The difference between the two categories is 4." "The sequence increases in equal steps." EXAMPLE PICTOGRAM Fruit Number of children Apples ●●●●●●●● Bananas ●●●●●●●● Oranges ●●●●●●●● ● = 2 children THE SYMBOL REPRESENTS DATA – IT IS NOT ALWAYS WORTH ONE.	Interpret & Relate NEW / EXTENDED LANGUAGE • bar chart • table • frequency • axis • horizontal • vertical • scale • interval • interpret • compare • relationship • sequence TALK MATHEMATICALLY "The vertical axis increases in intervals of 5." "The most frequent category is..." "The data shows that..." "I can describe the relationship between these values." EXAMPLE BAR CHART Favourite School Sport Number of children Football Netball Rugby Hockey Sport READ THE GRAPH → INTERPRET THE RELATIONSHIP.	Data, Change & Pattern NEW / EXTENDED LANGUAGE • discrete data • continuous data • time graph • line graph • axis • interval • trend • increase • decrease • constant • relationship • variable TALK MATHEMATICALLY "The graph shows an increasing trend." "The temperature remained constant between..." "The variables change over time." "The relationship continues because..." EXAMPLE LINE GRAPH Temperature Over a Day Temperature (°C) Time 08:00 12:00 16:00 20:00 INTERPRET THE DATA TO UNDERSTAND HOW THINGS CHANGE OVER TIME.	Proportion & Generalisation Foundations NEW / EXTENDED LANGUAGE • relationship • proportion • proportional • scale • scale factor • correspondence • decrease • term • rule • unknown • variable • expression TALK MATHEMATICALLY "For every 2 red counters there are 3 blue counters." "The quantities increase proportionally." "The rule for this sequence is..." "The symbol represents an unknown value." LANGUAGE PREPARES CHILDREN FOR FORMAL RATIO AND ALGEBRA IN YEAR 6.	Statistics, Ratio & Algebra STATISTICS • mean • average • pie chart • percentage • proportion • frequency • interpret • compare • data set RATIO • ratio • proportion • proportional • for every • part • whole • scale factor • corresponding values ALGEBRA • variable • unknown • symbol • expression • equation • formula • substitute • sequence • term • rule • generalise TALK MATHEMATICALLY "The ratio of red to blue is 2 : 3." "The mean is the total divided by the number of values." "In the expression $3n + 2$, n represents a variable." "I can generalise the relationship as..." DESCRIBING WHAT WE NOTICE → EXPRESSING MATHEMATICAL RELATIONSHIPS.

STATISTICS LANGUAGE JOURNEY						RATIO LANGUAGE JOURNEY				ALGEBRA LANGUAGE JOURNEY			
sort	category	data	tally	pictogram	table	EARLY LANGUAGE	RELATIONSHIP	FORMAL RATIO	PROPORTIONAL REASONING	EYFS	KS1	KS2	UPPER KS2
●●●●●	●●●●●	●●●●●		●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	2, 4, 6, 8...	3, 7, 11, 15...	4n - 1
line graph						"For every 2 red, there are 3 blue."	2 red correspond to 3 blue."	2 : 3	4 : 6 6 : 9	"It repeats."	"Add 2 each time."	"Add 4 each time."	GENERAL RULE
COLLECT → REPRESENT → READ → INTERPRET → COMPARE → CONCLUDE						RATIO DESCRIBES A MULTIPLICATIVE RELATIONSHIP.				ALGEBRA IS A LANGUAGE FOR EXPRESSING GENERAL MATHEMATICAL RELATIONSHIPS.			

READING DATA PRECISELY		UNKNOWN OR VARIABLE?		MEAN LANGUAGE		SAME RELATIONSHIP – DIFFERENT REPRESENTATION	
How many pets do we have?	✓ Check the key. ✓ Check the scale. ✓ Check the interval. ✓ Read carefully. ✓ Interpret accurately. ✓ Compare precisely.	UNKNOWN $\square + 7 = 12$ The box represents one value we need to find.	VARIABLE $y = 3x + 1$ x can take different values, and y changes accordingly.	4, 6, 7, 7, 11 Total = 35 Number of values = 5 Mean = $35 \div 5 = 7$ MEAN IS ONE TYPE OF AVERAGE.	+ For every 1 green counter, there are 2 purple counters.	OBJECTS ●●●●●	RATIO 1 : 2
Dog ●●●●● Cat ●●●●● Rabbit ●●●●●					Green 1 2 2 4 3 6 4 8	Purple 2 4 4 8	ALGEBRA $p = 2g$
●●●●● = 2 pets					WORDS → OBJECTS → RATIO → TABLE → GENERALISATION		

LANGUAGE MATTERS: USE	REASONING LANGUAGE PROGRESSION	END-POINT LANGUAGE
✓ data, information, category ✓ represent, key, scale, interval ✓ frequency, trend, comparison ✓ mean, average ✓ ratio, proportion, proportional ✓ for every, part, whole ✓ variable, unknown, symbol ✓ expression, equation, formula ✓ sequence, term, rule ✓ generalise, relationship	"I notice..." "The pattern repeats..." "The sequence increases by..." "The data shows..." "There is a relationship between..." "For every ... there are ..." "The quantities are proportional because..." "I can represent the relationship as..." "I can generalise..."	By the end of Year 6, pupils should confidently: ✓ collect and describe data ✓ represent information appropriately ✓ interpret charts and graphs ✓ compare data precisely ✓ calculate and explain the mean ✓ describe ratio and proportion ✓ identify variables and unknown ✓ interpret expressions and equations ✓ describe sequences and rules ✓ generalise mathematical relationships
AVOID ✗ "The graph goes up." ✗ "Average" when you mean the mean. ✗ "The letter is the answer." ✗ "Ratio is just fractions." ✗ Writing 2 : 3 without saying "for every..." ✗ Calling an expression an equation (unless = sign).	Strong language builds strong mathematical thinkers.	3n + 2

SORT → DESCRIBE → INTERPRET → RELATE → GENERALISE → REPRESENT → REASON

Notice the pattern. Describe the relationship. Express the mathematics.

♥ EVERY CHILD.

★ EVERY CHANCE.

📊 EVERY DAY.

FROM MATHEMATICAL TALK TO MATHEMATICAL INDEPENDENCE

Building confident mathematical thinkers from EYFS to Year 6

At St Stephen's, mathematical vocabulary is taught so that children can do more than name concepts. Through explicit modelling, oral rehearsal, representations and carefully developed sentence structures, pupils increasingly use mathematical language independently to describe, explain, justify, prove and generalise their thinking.



EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
NOTICE & TALK	DESCRIBE	CONNECT & EXPLAIN	REASON	JUSTIFY	PROVE & CONJECTURE	GENERALISE
CHILDREN BEGIN WITH... I notice... I can see... There are... It is the same/different because... I know what comes next...	I know ___ because... ___ is greater than ___ because... I represented it using... The same thing is... First I..., then I...	I know this because... This is similar to ___ because... I used ___ because... I agree/disagree because... I can check this by...	This must be true because... I noticed the relationship between... I used what I know about ___ to... Another representation would be... My strategy is efficient because...	I agree/disagree with ___ because... The evidence for this is... This cannot be ___ because... Both representations are equivalent because... I selected this strategy because...	I predict that... My conjecture is... I can prove this by... This is always/sometimes/never true because... A counterexample would be...	I can generalise that... For any value of... The relationship can be represented as... This will always hold because... My reasoning proves that... An exception would be...
TEACHER SUPPORT Model vocabulary Repeat • Gesture Visuals • Objects Recast language Example: Child: "That one's bigger." Teacher: "Yes - it is greater. Five is greater than three."	END POINT Children use taught vocabulary to describe their mathematical thinking.	END POINT Children connect ideas and explain how they know.	END POINT Children use mathematical vocabulary to reason about relationships.	END POINT Children justify decisions using mathematical evidence.	END POINT Children test mathematical claims and construct convincing arguments.	END POINT Children independently use precise mathematical language to communicate sophisticated reasoning.

THE REASONING LANGUAGE JOURNEY

I NOTICE...
I DESCRIBE...
I EXPLAIN...
I CONNECT...
I JUSTIFY...
I PROVE...
I GENERALISE...

The sentence stem is a scaffold - not the end point.

As children become more confident, they shouldn't need adults continually feeding them the language structure.

FROM WORD TO INDEPENDENT THINKING

1 HEAR IT → 2 SAY IT → 3 SEE IT → 4 USE IT → 5 OWN IT

Teacher explicitly models → Child rehearses orally → Language connects to representation → Child applies vocabulary in context → Child selects precise language independently

VOCABULARY BECOMES POWERFUL WHEN CHILDREN CAN USE IT WITHOUT A PROMPT.

TEACHER LANGUAGE MATTERS

INSTEAD OF...	ASK...
What did you get?	How do you know?
Who has the answer?	Who can explain the relationship?
Is that right?	What mathematical evidence supports your answer?
Can anyone help them?	Can anyone build on that reasoning?
What's the rule?	Can you generalise the relationship?

OUR QUESTIONS SHAPE THE LANGUAGE CHILDREN USE.

REPRESENTATION + LANGUAGE + SYMBOL

ACTION / IMAGE → LANGUAGE → SYMBOL → RELATIONSHIP → GENERALISATION

Three equal groups of four → $3 \times 4 = 12$ → 3 and 4 are factors of 12 → Multiplication is commutative, so 4×3 also equals 12.

ONE IDEA - MANY WAYS TO EXPRESS AND CONNECT IT.

SCAFFOLD → FADE → INDEPENDENCE

1 TEACHER MODELS "I know ___ because..."
 2 CHILD COMPLETES "I know ___ because..."
 3 CHILD SELECTS A STEM Several stems available.
 4 CHILD EXPLAINS WITHOUT A STEM
 5 CHILD ADAPTS LANGUAGE TO THE MATHEMATICS

INDEPENDENT MATHEMATICAL COMMUNICATION
 We don't remove support because of age - we fade it when it is no longer needed.

ACCESS FOR ALL

Children may access mathematical language through:

Visuals, Manipulatives, Wdigit, Gesture, Modelling, Repetition, Sentence stems, Partner rehearsal

THE MATHEMATICAL LANGUAGE REMAINS AMBITIOUS.
 Scaffold access - not mathematical thinking.

RETRIEVAL OF VOCABULARY

Vocabulary should be deliberately revisited through:

Daily retrieval, Lesson starters, Flashcards / visuals, Match words to representations, Odd one out, Explain the error, Sentence completion, Partner explanation

NEW WORDS CONNECT TO KNOWN WORDS.
 NOT ISOLATED WEEKLY VOCABULARY LISTS.

WHAT SUCCESS SOUNDS LIKE

I notice a relationship...
 I can represent it...
 I know this because...
 I disagree because...
 I can prove it...
 This must be true...
 I can generalise...

I THINK, SPEAK & REASON MATHEMATICALLY.

OUR WHOLE-SCHOOL NON-NEGOTIABLES

- ✓ Mathematical vocabulary is explicitly taught
- ✓ Teachers consistently model precise terminology
- ✓ Vocabulary is connected to representations and symbols
- ✓ Children have regular opportunities for mathematical talk
- ✓ Oral rehearsal supports written reasoning
- ✓ Sentence stems are taught, used and gradually faded
- ✓ Everyday language is developed into precise language
- ✓ Previous vocabulary is deliberately revisited
- ✓ Misconceptions in mathematical language are addressed
- ✓ SEND/EAL support increases access without reducing ambition
- ✓ Children increasingly select vocabulary independently
- ✓ Reasoning progresses from describing to explaining, justifying and generalising

OUR END POINT
 By the end of Year 6, we want pupils who can:

NOTICE mathematical structure → DESCRIBE it precisely → CONNECT it to prior knowledge → EXPLAIN their thinking → JUSTIFY their decisions → PROVE mathematical claims → GENERALISE

THE GOAL IS NOT TO KNOW MORE MATHEMATICAL WORDS.
THE GOAL IS TO USE MATHEMATICAL LANGUAGE TO THINK.

HEAR → SAY → DESCRIBE → EXPLAIN → JUSTIFY → PROVE → GENERALISE
 Precise language • Connected thinking • Independent mathematical reasoning
 EVERY CHANCE. EVERY DAY.