THIRD SPACE LEARNING

Sentence Stems and Vocabulary Lists

Multiplication and Division

Kindergarten to 5th Grade

Sentence Stems in a nutshell

A sentence stem provides students with a way to communicate their ideas with mathematical precision and clarity.

A sentence stem is a very structured sentence that often expresses a key conceptual idea or generalisation.

The structure of a sentence stem provides a framework to embed conceptual knowledge and build understanding.

How to use the questions in this resource

To use sentence stems in lessons, first introduce the sentence stem and explain how and when to use it. It is very important that the students understand the sentence stem otherwise it will not embed their learning. After this, the teacher should model the sentence stem and the students chant it back. Encourage repetition of the sentence stem throughout the lesson or lessons to come.

Sentence stems can be a whole sentence, for example:

- A half is one of two equal parts.

Or with missing parts to be filled, for example:

- A (fraction) is (numerator) out of (denominator) parts.

Where there is a missing part, we have given an example of a completed sentence as shown below. There are (number / items). Half of (whole) is (half).

- There are 8 counters. Half of 8 is 4.

By providing the students with a structure to follow, they will have an accurate way to discuss the given topic. By using repetition, the concepts expressed in the sentence stems will become embedded.

Kindergarten and 1st Grade

Pre-Multiplication Skills

Grouping

There are (number / items) in each group. There are (number) groups. There are (number / items) altogether.

- *There are 2 cubes in each group. There are 4 groups. There are 8 cubes altogether.*

There are (number) groups / sets of (number / item).

- *There are 10 groups of 5 cars.*

Equal groups / unequal groups

There are (number) groups / sets of (number / item).

- *There are 3 groups of 5 cars.*

This is not (number) groups / sets of (number / item) as they are not equal groups.

- *This is not 2 groups of 10 sweets, as they are not equal groups.*

Arrays

In this array, there is / are (number / item) in each row. There is / are (number) rows of (number / items).

- *In this array, there are 5 oranges in each row. There are 6 rows of 5 oranges.*

In this array, there is / are (number / item) in each column. There is / are (number) columns of (number / item).

- *In this array, there are 10 cookies in each column. There are 3 columns of 10 cookies.*

Double

Double (number) is (number).

- *Double 5 is 10.*

Twice as much as (number) is (number).

- *Twice as much as 5 is 10.*

Pre-Division Skills

Grouping

One group of (number), two groups of (number), three groups of (number)...

- *One group of 5, two groups of 5, three groups of 5,...*

Each (item) can hold (number / item). (number / item) will need (number / item).

- *Each box can hold 2 cupcakes. 8 cupcakes will need 4 boxes.*

There are (number) equal groups of (number). There are (number) altogether.

- *There are 6 equal groups of 2. There are 12 altogether.*

Kindergarten and 1st Grade - Continued

Sharing

One for you, one for you, one for you,....
(number / item) have been shared equally into (number) groups / sets. There are (number / item) in each group / set.
OR each group / set has (number / item).

- *15 toy cars have been shared equally into 3 groups. There are 5 toy cars in each group.*
- *OR Each group has 5 toy cars.*

(number / item) have not been shared equally between (number) groups / sets. There are not equal groups / sets of (item).

- *20 sweets have not been shared equally between 3 groups. There are not equal groups of sweets.*

Share (number) equally between (number) groups. Each group has (number).

- *Share 14 equally between 2 groups. Each group has 7.*

Array

(number / item) have been used to make this array. There are (number) rows of (number / item).

- *10 oranges have been used to make this array. There are 5 rows of 2 oranges.*

(number / item) have been used to make this array. There are (number) columns of (number / item).

- *15 cookies have been used to make this array. There are 3 columns of 5 cookies.*

Vocabulary

Array
Backwards
Column
Double
Equal
Equal groups of
Equal sets of
Fives
Forwards
Grouping
Groups of
Multiple
Pairs
Patterns
Repeated addition
Row
Share
Share equally
Sharing
Sets of
Skip counting
Tens
Twos
Unequal

2nd Grade

Even / Odd

Even numbers have (0, 2, 4, 6, 8) in the ones column.

Odd numbers have (1, 3, 5, 7, 9) in the ones column.

After an even number comes an odd number.

Multiples of ten are always even numbers.

The two times table is made up of even numbers.

Repeated Addition (array)

There are (number) groups of (number / item). (number) + (number) = (number). There are (number / item) altogether.

- There are 3 groups of 5 stars. 5 + 5 + 5 = 15. There are 15 stars altogether.

There are (number) groups of (number / item). There are (total / item) altogether.

- There are 9 groups of 5 apples. There are 45 apples altogether.

In this array, there are (number / item) in each row. There are (number) rows of (number / item), so (number) x (number) = (total)

- In this array, there are 5 oranges in each row. There are 6 rows of 5 oranges, so 5 × 6 = 30.

[Link to fact family: 30 ÷ 5 = 6 and 30 ÷ 6 = 5]

In this array, there are (number / item) in each column. There are (number) columns of (number / item), so (number) x (number) = (total)

- In this array, there are 10 cookies in each column. There are 3 columns of 10 cookies, so 10 × 3 = 30

[Link to fact family: 30 ÷ 3 = 10 and 30 ÷ 10 = 3]

Vocabulary

Array
Columns
Equal groups
Even numbers
Fact Families
Odd numbers
Repeated addition
Rows

3rd Grade

Times Tables

Multiplication is commutative – you can swap the numbers in the equation.

(number a) x (number b) = (number b) x (number a).

- *3 × 10 = 10 × 3*

All the numbers in the ten times table are also in the five times table.

Some of the numbers in the (number) times table are in the (number) times table.

Some of the numbers in the five times table are in the ten times table.

(number) x 5 = (number) x 10 OR (number) x 10 = (number) x 5

- *6 x 5 = 3 x 10 OR 3 x 10 = 6 x 5*

When counting in tens from 0, the ones column will not change.

A number is a multiple of 5 if it can be divided into five equal groups.

A number is a multiple of 10 if it can be divided into ten equal groups.

(number) is a multiple of (number) because it is in the (number) times table.

- *8 is a multiple of 2 because it is in the 2 times table.*

(number) cannot be in the (number) times table because...

- *21 cannot be in the 10 times table because....*

A multiple of (number) is (number).

- *A multiple of 3 is 18.*

The multiple of 3 between (number) and (number) is (number).

- *The multiple of 3 between 10 and 14 is 12.*

The number is even so can be divided by two.

The ones digit is 5 or 0 so the number must be divisible by 5.

General multiplication

The inverse of multiplication is division.

I know that (number a) times (number b) equals (number c) because (number b) times (number a) equals (number c).

- *I know that 3 times 6 equals 18 because 6 times 3 equals 18.*

The product of (number a) and (number b) is (number c).

- *The product of 7 and 4 is 28.*

If (number a) x (number b) = (number c), then (number c) ÷ (number a / b) = (number b / a)

- *If 3 × 8 = 24, then 24 ÷ 8 = 3*
- *OR 24 ÷ 3 = 8*

Multiply and Dividing by 4 and 8

To calculate 4 groups of (number), I can double (number) and double the answer.

- *To calculate 4 groups of 6, I can double 6 and double the answer.*

(multiplier) x 4 = (product)

- *6 × 4 = 24*

To multiply by 8, I can double and double again.

To divide a number by 4, I can half the

3rd Grade - Continued

number and half the answer.
To find a quarter of something is the same as dividing by 4.
To divide something by 8, I can halve, halve and halve again.

Using known facts

If (number a) x (number b) = (number c), then (number c) ÷ (number a / b) = (number b / a)

- *If 40 × 2 = 80, then 80 ÷ 2 = 40*
- *OR 80 ÷ 40 = 2*

If (number a) x (number b) = (number c), then (number a) tens x (number b) = (number c) tens.

- *If 8 × 7 = 56, then 8 tens × 7 = 56 tens = 560 and 8 × 7 tens = 56 tens = 560*

If (number a) x (number b) = (number c), then (number c) tens ÷ (number b) = (number a) tens, so (number c x 10) ÷ (number b) = (number a x 10).

- *If 8 × 7 = 56, then 56 tens ÷ 7 = 8 tens, so 560 ÷ 7 = 80.*

I know that (number a) ÷ (number b) = (number c) because (number c) × (number b) = (number a)

- *I know that 24 ÷ 3 = 8 because 8 × 3 = 24*

(number a) ÷ (number b) = ?. This means ? x (number b) = (number a)

- *72 ÷ 8 = ?. This means ? × 8 = 72*

If (number a) ÷ (number b) = (number c), then (number a) tens ÷ (number b) = (number c) tens, so (number a x 10) ÷ (number b) = (number c x 10)

- *If 40 ÷ 4 = 10, then 40 tens ÷ 4 = 10 tens, so 400 ÷ 4 = 100*

To divide by (number), I can first divide by (number) and then divide by (number)

- *To divide by 12, I can first divide by 4 and then divide by 3.*

Scaling

There are (number) times as many (item) as (item).

- *There are 3 times as many red tops as blue tops.*

Correspondence

For example, how many outfit combinations could be made?
(number a / item a) and (number b / item b) means (number a) x (number b), so there are (product) different combinations.

- *4 shirts and 3 shorts means 4 × 3, so there are 12 different combinations.*

Vocabulary

Associative property	Product
Correspondence	Scaling
Eights	Short division
Factor	Short multiplication
Fours	Threes

4th Grade

General multiplication
Multiplication can be completed in any order. (Commutative property)
When multiplying numbers using the column method, always start with the lowest place value column.

The distributive property
(number a) groups of (number b) is the same as (number c) groups of (number b) plus (number d) groups of (number b).

- *12 groups of 6 is the same as 10 groups of 6 plus 2 groups of 6*

The distributive property: (number) x (number) = (number) x (number) – / + (number) x (number)

- *The distributive property: 9 × 8 = 10 × 8 – 1 × 8*
- *11 × 8 = 10 × 8 + 1 × 8*

General division
The dividend is the number you are dividing.
The divisor is the number you are dividing by.
The quotient is the answer to a division fact. (42 ÷ 6 = 7, so the quotient is 7).
First there were (number a / item a). They were shared into groups of (number b). There are (number b) groups of (number c). (number a) ÷ (number b) = (number c)

- *First there were 45 cupcakes. They were shared into groups of 9. There are 9 groups of 5. 45 ÷ 9 = 5*

Remainder
The remainder is the part that may be left over following the division.
(number a) is not in the (number b) times tables; when you divide (number a) by (number b) there is a remainder of (number c).

- *32 is not in the 3 times tables; when you divide 32 by 3 there is a remainder of 2.*

Multiplying and dividing by specific numbers
Multiplying anything by 0 gives an answer of 0 as this is the same as no groups of anything.
Multiplying anything by 1 gives the same number as this is the same as one group of anything.
To multiply by 6, I can multiply by 3 and double the answer.
Dividing a number by 1 gives the same number as this is just one group of anything.

Multiplying and dividing by 10, 100
When multiplying by 10, the digits move one place to the left.
When multiplying by 100, the digits move two places to the left.
When multiplying by (10 / 100), the number is (10 / 100) times bigger.

4th Grade - Continued

When dividing by (10 / 100), the number is being split into (10 / 100) equal parts.
The number is (10 / 100) times smaller.
When dividing by 10, we move the digits one place to the right.
When dividing by 100, we move the digits two places to the right.
There are (number) tens in (number).

- *There are 10 tens in 100.*

Factor / factor pairs and multiples

A factor is a whole number that multiplies by another whole number to make a product.
(number a) ÷ (number b) = (number c), so (number b) and (number c) are factors of (number a).

- *48 ÷ 8 = 6, so 8 and 6 are factors of 48.*

The product of (number a) and (number b) is (number c), so (number b) and (number a) are a factor pair of (number c).

- *The product of 6 and 8 is 48, so 6 and 8 are a factor pair of 48.*

(number a) is a multiple of both (number b) and (number c).

- *48 is a multiple of both 8 and 6*

(number a) is not a factor of (number b); when you divide (number b) by (number a) there is a remainder of (number c).

- *3 is not a factor of 32; when you divide 32 by 3 there is a remainder of 2.*

(number) is a multiple of (number) so it is divisible by (number).

- *45 is a multiple of 5 so it is divisible by 5.*

Related facts and known facts

I know that (number a) x (number b) ones = (number c) ones so I know that (number a) x (number b) tens = (number c) tens.

- *I know that 3 x 3 ones = 9 ones so I know that 3 x 3 tens = 9 tens*

I know that (number a) ones ÷ (number b) = (number c) ones so I know that (number a) tens ÷ (number b) = (number c) tens.

- *I know that 12 ones ÷ 3 = 4 ones so I know that 12 tens ÷ 3 = 4 tens*

(number a) is divisible by (number b) because (number b) x (number c) = (number a)

- *108 is divisible by 9 because 9 × 12 = 108*

To multiply by (number), I can multiply by (number) and then double / halve the product.

- *To multiply by 8, I can multiply by 4 and then double the product.*

4th Grade - Continued

To multiply by (number), I can multiply by (number) and then add / subtract one group of (number) from the product.

- *(For 9 x 7) To multiply by 9, I can multiply by 10 and then subtract one group of 7.*

Correspondence

(number / item a) and (number / item b) means (a) x (b), so there are (number c) different combinations.

- *4 shirts and 3 shorts means 4 × 3, so there are 12 different combinations.*

(number a) x (number b) = (number c).
There are (number c) combinations.

- *3 x 3 = 9. There are 9 combinations.*

Composite and prime numbers

All numbers with more than two factors are composite numbers.
A composite number is not prime, it has more than two factors.
A prime number only has two factors, 1 and itself.

Vocabulary

Composite number
Distributive property
Dividend
Divisible by
Divisor
Dividing by 10, 100
Factor
Factor pair
Inverse
Multiplying by 0 and 1
Multiplying by 10, 100
Prime number
Quotient
Remainder

5th Grade

General Division

(number a) is a multiple of (number b).

This means that (number a) is divisible by (number b).

- *108 is a multiple of 9. This means that 108 is divisible by 9.*

(number a) is divisible by (number b) because (number b) x (number c) = (number a)

- *108 is divisible by 9 because 9 × 12 = 108*

Multiplying and dividing by 1,000

When multiplying by 1,000, the digits move three places to the left.

When multiplying by 1,000, the number is 1,000 times bigger.

When dividing by 1,000, the digits move three places to the right.

When dividing by 1,000, the number is 1,000 times smaller.

Common multiples

Common multiples of given numbers are numbers that are in the times tables of both numbers.

Common multiples of (number a) and (number b) are ....

- *Common multiples of 2 and 5 are 10, 20, 30...*

The first common multiple of (number a) and (number b) is (number c)

- *The first common multiple of 2 and 3 is 6.*

Common factors

The factors of (number a) are...

The factors of (number b) are...

The common factors of (number a) and (number b) are...

- *The factors of 15 are 1, 3, 5, 15.*
- *The factors of 21 are 1, 3, 7 and 21.*
- *The common factors of 15 and 21 are 1 and 3.*

Common factors of (number a) and (number b) are 1 and (number c) as (number a) and (number b) are both a multiple of 1 and (number c)

- *Common factors of 15 and 21 are 1 and 3 as 15 and 21 are both a multiple of 1 and 3.*

Square and cube numbers

A square number is made when you multiply a number by itself.

(number) x (number) = (product), so (product) is a square number.

- *4 × 4 = 16, so 16 is a square number.*

A cube number is made when you multiply a number by itself twice.

(number) x (number) x (number) = (product), so (product) is a cube number.

- *2 × 2 × 2 = 8, so 8 is a cube number.*

5th Grade - Continued

Lowest common multiple

The smallest common multiple of any given numbers is called the lowest common multiple (LCM).

The LCM of (number a) and (number b) is (LCM).

- *The LCM of 3 and 6 is 6.*

Highest common factor

The highest common factor (HCF) is the largest common factor of given numbers.

The common factors of (number) and (number) are ... - the HCF is (number).

- *The common factors of 16 and 20 are 1, 2 and 4 - the HCF is 4.*

Parentheses and PEMDAS are applicable to division also.

PEMDAS

PEMDAS tells us the order in which to complete a calculation. We do **P**arentheses, **E**xponents, **M**ultiplication and **D**ivision, **A**ddition and **S**ubtraction.

A parenthesis is used to tell us which part of an equation to do first according to PEMDAS.

Exponents show how many times to multiply a number by itself.

For (number) squared, write (number)^2.

This is the same as (number) x (number).

- *For 5 squared, write 5^2. This is the same as 5 x 5.*

For (number) cubed, it is the same as (number) x (number) x (number). This can be read as (number) to the power of 3, and written as (number)^3.

- *For 5 cubed, it is the same as 5 x 5 x 5. This can be read as 5 to the power of 3, and written as 5^3.*

Vocabulary

Common factors
Common multiples
Cube
Cubed
Dividing by 10, 100 and 1,000
Exponents (powers)
Highest common factor
Lowest common multiple
Multiplying by 10, 100 and 1,000
Order of operations (PEMDAS)
Parentheses
Square
Squared

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