



**Intent**



# Maths

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# Maths

## Why is maths important?

At Ivegill C of E Primary School, all of our teaching and learning builds on our core values; Endurance, Trust and Community. We recognise the importance of maths in every aspect of daily life; we encourage children to be inquisitive throughout their time at our school and beyond. We believe that children must develop fluency, reasoning and problem solve skills with positive attitudes as it is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.



# Intent



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## Aims of the Maths Curriculum

The national curriculum for maths aims to ensure that all pupils:

- Become **fluent** in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time.
  - Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- **Reason** mathematically; follow a line of enquiry, conjecture relationships and generalisations.
  - Develop an argument, justification and proof by using mathematical language.
- **Problem solve** by applying knowledge to a variety of routine and non-routine problems. Breaking down problems into simpler steps and persevering in answering.

The National Curriculum sets out year-by-year programmes of study for key stages 1 and 2. This ensures continuity and progression in the teaching of mathematics.



# Intent



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**The purpose of mathematics in our school is to develop;**

- Positive attitudes towards the subject and awareness of the relevance of mathematics in the real world
  - Competence and confidence in using and applying mathematical knowledge, concepts and skills
  - An ability to solve problems, to reason, to think logically and to work systematically and accurately
  - Initiative and motivation to work both independently and in co-operation with others
  - Confident communication of maths where pupils ask and answer questions using mathematical vocabulary, openly share work and learn from mistakes
  - An ability to use and apply mathematics across the curriculum and in real life
- An understanding of mathematics through a process of enquiry and investigation



# Intent



## Mathematics

At Ivegill C of E Primary School children will gradually build on their mathematical skills throughout the Key Stages based on National Curriculum expectations.

### Key Stage 1:

- The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This involves working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].
- Develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.
- Use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- Know the number bonds to 20 and be precise in using and understanding place value.
- An emphasis on practice at this early stage will aid fluency.
- Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.



Intent



## Mathematics

### Lower Key Stage 2:

- Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.
- Develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- Develop their ability to solve a range of problems, including with simple fractions and decimal place value.
- Pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
- Be confident using measuring instruments with accuracy and make connections between measure and number.
- Memorise their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
- Read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.



# Intent



## Mathematics

### Upper Key Stage 2:

- Extend their understanding of the number system and place value to include larger integers.
- Develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
- Develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation.
- Teaching in should consolidate and extend knowledge of geometry and measures developed in number.
- Classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- Be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
- Read, spell and pronounce mathematical vocabulary correctly.



# Intent



## Concrete, pictorial, abstract Approach

Our maths curriculum is delivered giving children to opportunity to work through maths topics through the concrete, pictorial and abstract approach. This approach enables staff to deepen pupil understanding and embed learning through hands on activities.

It is important that the children are allowed to explore Maths and present their findings not only in a written form but also visually and verbally; to that end the school adopt the CPA approach: concrete, pictorial, and abstract. This will allow children to experience the physical aspects of Maths before finding a way to present their findings and understandings in a visual form before relying on the abstract numbers. Each class has a stock of resources that are age appropriate which the children are encouraged to use to support this approach.





Intent



## Early Years

The EYFS Statutory Framework 2014 sets standards for the learning, development and care of children from birth to five years old and supports an integrated approach to early learning. This is supported by the 'Development matters' non statutory guidance.

The EYFS Framework in relation to mathematics aims for our pupils to:

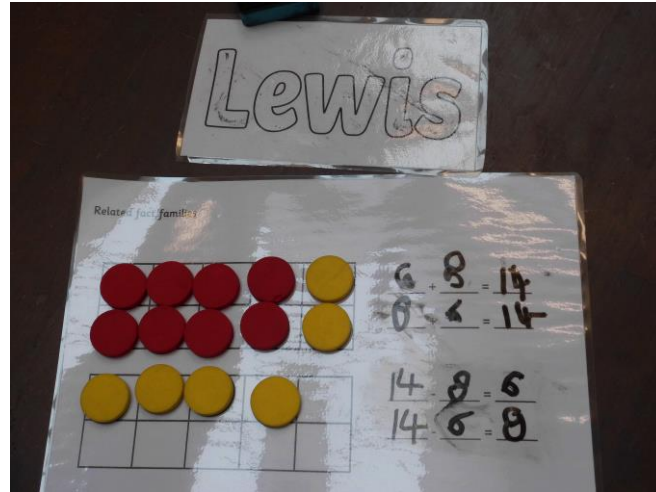
- Develop and improve their skills in counting.
- Understand and use numbers.
- Calculate simple addition and subtraction problems.
- Describe shapes, spaces, and measures.



# Intent



## Maths in EYFS



# Content and sequence - EYFS to Key Stage 1

## Overview



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Autumn	Getting to Know You			Just Like Me!			It's Me 1 2 3!			Light and Dark			Consolidation	
Spring	Alive in 5!			Growing 6, 7, 8			Building 9 and 10			Consolidation				
Summer	To 20 and Beyond			First Then Now			Find My Pattern			On The Move				



# Intent



Maths

# Content and Sequence: Year 1



# Intent



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	Number <b>Place value</b> (within 10) VIEW				Number <b>Addition &amp; subtraction</b> (within 10) VIEW				Geometry <b>Shape</b> VIEW	Number <b>Place value</b> (within 20) VIEW			
Spring term	Consolidation	Number <b>Addition &amp; subtraction</b> (within 20) VIEW			Number <b>Place value</b> (within 50) VIEW		Measurement <b>Length &amp; height</b> VIEW		Measurement <b>Weight &amp; volume</b> VIEW		Consolidation		
Summer term	Consolidation	Number <b>Multiplication &amp; division</b> VIEW			Number <b>Fractions</b> VIEW		Geometry <b>Position &amp; direction</b> VIEW	Number <b>Place value</b> (within 100) VIEW		Measurement <b>Money</b> VIEW	Measurement <b>Time</b> VIEW		

# Content and Sequence: Year 2



# Intent



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	<b>Getting to know you</b> (Take this time to play and get to know the children!)  Contains overviews and frequently asked questions  <a href="#">VIEW</a>		<b>Just like me!</b> Match and sort Compare amounts Compare size, mass & capacity Exploring pattern  <a href="#">VIEW</a>		<b>It's me 1, 2, 3!</b> Representing 1, 2 & 3 Comparing 1, 2 & 3 Composition of 1, 2 & 3 Circles and triangles Positional language  <a href="#">VIEW</a>		<b>Light &amp; dark</b> Representing numbers to 5 One more or less Shapes with 4 sides Time  <a href="#">VIEW</a>					
Spring term	<b>Alive in 5!</b> Introducing zero Comparing numbers to 5 Composition of 4 & 5 Compare mass (2) Compare capacity (2)  <a href="#">VIEW</a>		<b>Growing 6, 7, 8</b> 6, 7 & 8 Combining two amounts Making pairs Length & height Time (2)  <a href="#">VIEW</a>		<b>Building 9 &amp; 10</b> Counting to 9 & 10 Comparing numbers to 10 Bonds to 10 3-D shapes Spatial awareness Patterns  <a href="#">VIEW</a>		Consolidation					
Summer term	<b>To 20 and beyond</b> Build numbers beyond 10 Count patterns beyond 10 Spatial reasoning 1 Match, rotate, manipulate  <a href="#">VIEW</a>		<b>First, then, now</b> Adding more Taking away Spatial reasoning 2 Compose and decompose  <a href="#">VIEW</a>		<b>Find my pattern</b> Doubling Sharing & grouping Even & odd Spatial reasoning 3 Visualise and build  <a href="#">VIEW</a>		<b>On the move</b> Deepening understanding Patterns & relationships Spatial mapping (4) Mapping  <a href="#">VIEW</a>					

# Content and Sequence: Year 3 and 4



# Intent



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Number <b>Place value</b> <a href="#">VIEW</a>		Number <b>Addition and subtraction</b> <a href="#">VIEW</a>				Number <b>Multiplication and division</b> <a href="#">VIEW</a>					
Autumn term	Number <b>Place value</b> <a href="#">VIEW</a>		Number <b>Addition and subtraction</b> <a href="#">VIEW</a>		Measurement <b>Area</b> <a href="#">VIEW</a>	Number <b>Multiplication and division</b> <a href="#">VIEW</a>			Consolidation			
Spring term	Number <b>Multiplication and division</b> <a href="#">VIEW</a>		Measurement <b>Length and perimeter</b> <a href="#">VIEW</a>		Number <b>Fractions</b> <a href="#">VIEW</a>		Measurement <b>Mass and capacity</b> <a href="#">VIEW</a>					
Spring term	Number <b>Multiplication and division</b> <a href="#">VIEW</a>		Measurement <b>Length and perimeter</b> <a href="#">VIEW</a>	Number <b>Fractions</b> <a href="#">VIEW</a>			Number <b>Decimals</b> <a href="#">VIEW</a>					
Summer term	Number <b>Fractions</b> <a href="#">VIEW</a>	Measurement <b>Money</b> <a href="#">VIEW</a>	Measurement <b>Time</b> <a href="#">VIEW</a>		Geometry <b>Shape</b> <a href="#">VIEW</a>	Statistics <b>Statistics</b> <a href="#">VIEW</a>		Consolidation				
Summer term	Number <b>Decimals</b> <a href="#">VIEW</a>		Measurement <b>Money</b> <a href="#">VIEW</a>	Measurement <b>Time</b> <a href="#">VIEW</a>	Consolidation	Geometry <b>Shape</b> <a href="#">VIEW</a>		Statistics <b>Statistics</b> <a href="#">VIEW</a>	Geometry <b>Position and direction</b> <a href="#">VIEW</a>			

# Content and Sequence: Year 5 and 6



# Intent



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Number Place value <a href="#">VIEW</a>		Number Addition and subtraction <a href="#">VIEW</a>		Number Multiplication and division <a href="#">VIEW</a>		Number Fractions A <a href="#">VIEW</a>					
Autumn term	Number Place value <a href="#">VIEW</a>	Number Four operations <a href="#">VIEW</a>				Number Fractions A <a href="#">VIEW</a>		Number Fractions B <a href="#">VIEW</a>		Measurement Converting units <a href="#">VIEW</a>		
Spring term	Number Multiplication and division <a href="#">VIEW</a>		Number Fractions B <a href="#">VIEW</a>		Number Decimals and percentages <a href="#">VIEW</a>		Measurement Perimeter and area <a href="#">VIEW</a>		Statistics <a href="#">VIEW</a>			
Spring term	Number Ratio <a href="#">VIEW</a>	Number Algebra <a href="#">VIEW</a>	Number Decimals <a href="#">VIEW</a>	Number Fractions, decimals and percentages <a href="#">VIEW</a>		Measurement Area, perimeter and volume <a href="#">VIEW</a>		Statistics <a href="#">VIEW</a>				
Summer term	Geometry Shape <a href="#">VIEW</a>		Geometry Position and direction <a href="#">VIEW</a>		Number Decimals <a href="#">VIEW</a>		Number Negative numbers <a href="#">VIEW</a>	Measurement Converting units <a href="#">VIEW</a>		Measurement Volume <a href="#">VIEW</a>		
Summer term	Geometry Shape <a href="#">VIEW</a>		Geometry Position and direction <a href="#">VIEW</a>	Themed projects, consolidation and problem solving								



Implementation



# Maths

## Implementation





Implementation



## Modular Approach – Knowledge

At Ivegill C of E Primary School, maths is taught across each mixed age class in modules that enable pupils to study in depth key mathematical understanding, skills and vocabulary. Each module aims to activate and build upon prior learning, including EYFS, to ensure better cognition and retention.



## Implementation



### Minimum lesson expectations

All classes have a daily mathematics lesson where possible. In key stage one, lessons are 45-60 minutes and in key stage two at least 60 minutes. Teachers of the EYFS ensure the children learn through a mixture of adult led activities and child initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach.

In all lessons, learning objectives are clearly displayed and discussed.

Across a range of lessons children experience;

- engagement in mathematical discussion (talk partner or group work)
- investigations
- reasoning tasks
- problem solving
- practical experiences
- written methods
- Demonstrate their understanding through spaced learning.



Implementation



## Cumulative Quizzing Model (Supporting Cognitive Load)

Pupils are given opportunities to retrieve their knowledge at regular intervals throughout the unit through a 'teach – test – teach – test' model. The aim of this model is to reinforce and revisit previously taught knowledge and vocabulary. Children are tested using written quizzes or verbally. In KS2, this is also done through morning starters when the children arrive at school.



Implementation



## Vocabulary

At Ivegill, we want our children to have an expansive vocabulary and through teacher modelling and planning, children are given opportunity to use and apply appropriate vocabulary. Mathematic language is taught and built upon with vocabulary being a focus.



Implementation



# Reasoning and problem solving within a Year 4 lesson

4a. Laura is using straws to represent tenths. One straw is equal to one tenth.

She says: I have made 0.9

Is Laura correct? Explain your answer.

4b. Graham is using straws to represent tenths. One straw is equal to one tenth.

He says: I have made 0.6

Is Graham correct? Explain your answer.

She is incorrect because she has eight straws but if she wants 0.9 then you would need 9 straws not 8. Also the straws are worth the tenths and there is nine tenths in the decimal.

He is correct because he has six straws and they all represent tenths. He has 6 straws so it would make 0.6

5. Which is the odd one out?

A.  $\frac{5}{10}$  B. Five tenths

C. 0.5 D. One Ones, Ten Tenths

5a. Which is the odd one out?

A.  $\frac{4}{10}$  B. nine tenths

C. 0.4 D. One Ones, Ten Tenths

D because it has 0 ones but has 5 tenths. All of the other ones have 1 one and 5 tenths. All of the other ones have 1 one and 4 tenths. All of the other ones have 1 one and 4 tenths but in a different way.

6a. Which representation does not show 2,132? Explain why.

a)

b) 2 thousands, 13 tens and 2 ones.

c)

6b. Write a representation for 3,056. Explain why.

a)

b) 30 thousands, 5 tens and 6 ones.

c)

c because it only has 2 thousands and 9 ones.

B because the number does not have 30 thousand it has three.

Reasoning questions used with pictorial representations.

‘Ivegill Challenge’ work used to extend learning when content secure.

**Ivegill Challenge**

Use these digit cards just once to fill all of the gaps in the calculations.

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

$\begin{array}{r} 657 \\ -359 \\ \hline 298 \end{array}$	$\begin{array}{r} 36 \\ -452 \\ \hline 284 \end{array}$	$\begin{array}{r} 871 \\ -199 \\ \hline 672 \end{array}$
$\begin{array}{r} 917 \\ -878 \\ \hline 41 \end{array}$	$\begin{array}{r} 169 \\ -275 \\ \hline 1094 \end{array}$	$\begin{array}{r} 2612 \\ -1758 \\ \hline 854 \end{array}$
$\begin{array}{r} 3269 \\ -1652 \\ \hline 1617 \end{array}$	$\begin{array}{r} 512 \\ -693 \\ \hline 4719 \end{array}$	$\begin{array}{r} 808 \\ -4782 \\ \hline 3226 \end{array}$



Implementation



# Maths planning

Example of the small steps which supports sequencing and planning.

## Small Steps

- Represent numbers to 1,000
- 100s, 10s and 1s
- Number line to 1,000
- Round to the nearest 10
- Round to the nearest 100
- Count in 1,000s
- 1,000s, 100s, 10s and 1s
- Partitioning
- Number line to 10,000
- Find 1, 10, 100 more or less
- 1,000 more or less
- Compare numbers

Year 2 statistics  
small steps

## Small Steps

- Make tally charts
- Draw pictograms (1-1)
- Interpret pictograms (1-1)
- Draw pictograms (2, 5 and 10)
- Interpret pictograms (2, 5 and 10)
- Block diagrams

Year 4 place value  
small steps



Implementation



## Tailoring for SEND

Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. Within daily mathematics lessons teachers have a responsibility to not only provide differentiated activities to support children with SEND but also activities that provide sufficient challenge for children who are high achievers. Children with IEP's may work on targets within a maths lesson as well as working on these on a 1:1 basis outside the mathematics lesson. Maths focused intervention in school helps children with gaps in their learning and mathematical understanding. These are delivered by trained support staff or the class teacher.



Implementation



## Oracy through Mathematical talk

When discussing their work or presenting information, pupils are encouraged to speak using full sentences and incorporating key mathematical vocabulary. This is modelled by teachers e.g. using my turn, your turn.





Implementation



## Continuous Professional Development

All staff have undergone CPD in Cognitive Load Theory, Spaced Practice Retrieval Theory and planning the wider curriculum through the use of Knowledge Notes. This has supported the development of the wider curriculum.



**Impact**



# Maths

# Impact



# Impact



## How do we measure the impact of maths teaching?

Teachers make assessments of children daily through;

- Regular marking of work.
- Analysing errors and picking up on misconceptions.
- Asking questions and listening to answers.
- Facilitating and listening to discussions.
- Making observations
- Recording this through 'No more marking'.

These ongoing assessments inform future planning and teaching. This allows lessons to be readily adapted following these assessments.



Impact



## Assessment

Each year group completes a termly assessment using the Progress in understanding primary mathematics (PUMA). Year 2 and Year 6 complete national tests (SATS) in May.

2019 national curriculum tests

### Key stage 2

#### Mathematics

Paper 1: arithmetic

First name				
MPD's name				
Last name				
Date of birth	Day	Month	Year	
School name				
OFSTED number				

[Access more tools and resources](#)

puma

### Progress in Understanding Mathematics Assessment

AUTUMN 3

Name: \_\_\_\_\_

Year	2	3	4	5	6
Mathematics					
English					
Science					
History					
Geography					
Art					
Music					
Physical Education					
Personal, Social and Health Education					
Religious Education					
Other					

HOODER

puma

### Progress in Understanding Mathematics Assessment

SPRING 1

Name: \_\_\_\_\_

Year	2	3	4	5	6
Mathematics					
English					
Science					
History					
Geography					
Art					
Music					
Physical Education					
Personal, Social and Health Education					
Religious Education					
Other					

HOODER



Impact

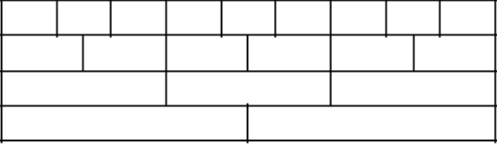


# Cumulative quizzing

Pupil end of module results are used to show much pupils have gained and retained across the module. This allows teachers to identify areas which need to be revisited.

Year 6  
Fractions (+ and -) A

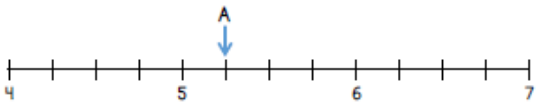
Name \_\_\_\_\_

**1** 

Use the fraction bars to simplify the fractions.

$\frac{6}{9} =$                        $5\frac{3}{6} =$   2 marks

**2** Max says  $\frac{30}{50}$  in its simplest form is  $\frac{15}{25}$   
Is Max correct?                      Yes                      No  1 mark  
Explain your answer.

**3**   
What number is the arrow pointing to?  1 mark  
\_\_\_\_\_

Draw an arrow to the number that is  $\frac{3}{4}$  less than A.  1 mark  
\_\_\_\_\_

What number is  $1\frac{1}{2}$  greater than A?  1 mark  
\_\_\_\_\_

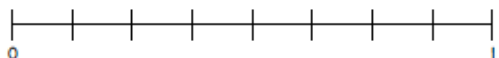
**4** Tick the statements that are true.

$\frac{3}{5}$  is greater than  $\frac{3}{7}$                         $1\frac{3}{8}$  is less than  $\frac{7}{8}$

$\frac{2}{8}$  is equal to  $\frac{5}{20}$                         $2\frac{1}{4}$  is greater than  $\frac{11}{4}$   2 marks

**5** Write the fractions in order from smallest to largest.  
You may use the number line to help you.

$\frac{3}{4}$      $\frac{5}{8}$      $\frac{3}{8}$      $\frac{1}{16}$



\_\_\_\_\_  2 marks

*End of unit White Rose Maths assessment*



Impact



## **Pupil book study**

**We conduct pupil book studies with the pupils. This is an opportunity to look at books with the pupils to learn about their learning. We look through 7 lenses as presented in the pupil book study book by Alex Bedford.**