



Building Understanding of Primary Maths Concepts
Through Consistent Use of Practical Resources

***With reference to the 2020 EEF Guidance Report:
'Improving Mathematics in the Early Years and KS1'***

As a primary maths intervention resource, Number Stacks aligns closely with many of the recommendations of the EEF Maths Guidance reports published in 2020.

1	2	3	4	5
Develop practitioners' understanding of how children learn mathematics 	Dedicate time for children to learn mathematics and integrate mathematics throughout the day 	Use manipulatives and representations to develop understanding 	Ensure that teaching builds on what children already know 	Use high quality targeted support to help all children learn mathematics 
- Professional development should be used to raise the quality of practitioner knowledge of mathematics, of children's mathematical development and of effective mathematical pedagogy. - Developmental progressions show us how children typically learn mathematical concepts and can inform teaching. - Practitioners should be aware that developing a secure grasp of early mathematical ideas takes time, and specific skills may emerge in different orders. - The development of self-regulation and metacognitive skills are linked to successful learning in early mathematics.	- Dedicate time to focus on mathematics each day. - Explore mathematics through different contexts, including storybooks, puzzles, songs, rhymes, puppet play, and games. - Make the most of moments throughout the day to highlight and use mathematics, for example, in daily routines, play activities, and other curriculum areas. - Seize chances to reinforce mathematical vocabulary. - Create opportunities for extended discussion of mathematical ideas with children.	- Manipulatives and representations can be powerful tools for supporting young children to engage with mathematical ideas. - Ensure that children understand the links between the manipulatives and the mathematical ideas they represent. - Ensure that there is a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept. - Encourage children to represent problems in their own way, for example with drawings and marks. - Use manipulatives and representations to encourage discussion about mathematics. - Encourage children to use their fingers—an important manipulative for children.	- It is important to assess what children do, and do not, know in order to extend learning for all children. - A variety of methods should be used to assess children's mathematical understanding, and practitioners should check what children know in a variety of contexts. - Carefully listen to children's responses and consider the right questions to ask to reveal understanding. - Information collected should be used to inform next steps for teaching. Developmental progressions can be useful in informing decisions around what a child should learn next.	- High quality targeted support can provide effective extra support for children. - Small-group support is more likely to be effective when: - children with the greatest needs are supported by the most experienced staff; - training, support and resources are provided for staff using targeted activities; - sessions are brief and regular; and - explicit connections are made between targeted support and everyday activities or teaching. - Using an approach or programme that is evidence-based and has been independently evaluated is a good starting point.

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Develop practitioners' understanding of how children learn mathematics



- Professional development should be used to raise the quality of practitioner knowledge of mathematics, of children's mathematical development and of effective mathematical pedagogy.
- Developmental progressions show us how children typically learn mathematical concepts and can inform teaching.
- Practitioners should be aware that developing a secure grasp of early mathematical ideas takes time, and specific skills may emerge in different orders.
- The development of self-regulation and metacognitive skills are linked to successful learning in early mathematics.

Number Stacks is based on a developmental progression of Key Skills, split into 5 different categories and linked to the English National Curriculum. It is essential that a child has a secure understanding of each skill before moving on to the next. You can view the Key Skills progression here:

<https://www.numberstacks.co.uk/wp-content/uploads/2022/01/Key-skills-pathways.pdf>

Key Skills: Number & Place Value

1	Read and write numbers to 10 in numerals	YR
2	Read and write numbers 11 to 20 in numerals	YR
3	Count backwards within 20 from any given number	YR
4	Identify 1 more or 1 less than a given number	YR
5	Order and compare numbers up to 20 using language 'more' and 'fewer'	YR
6	Count in multiples of 10 up to 100	Y1
7	Count backwards in multiples of 10 within 100	Y1
8	Read and write numbers to 100 in numerals, recognising the place value of each digit	Y1
9	Count backwards within 100 from any given number	Y1
10	Identify 1 or 10 more or less than a given number	Y2
11	Compare and order numbers from 0-100 using < and = signs	Y2
12	Read and write 3-digit numbers in numerals, recognising the place value of each digit	Y3
13	Find 10 or 100 more or less than a given number	Y3
14	Read and write 4-digit numbers in numerals, recognising the place value of each digit	Y3
15	Round any number to the nearest 10, 100 or 1000	Y4
16	Read and write numbers to at least 1 million	Y5
17	Compare and order numbers up to 1 million	Y5
18	Round any number to a given degree of accuracy	Y6

Key Skills: Addition & Subtraction

1	Recognise number bonds to 10	Y1
2	Recognise number bonds for numbers within 10	Y1
3	Add single digit numbers	Y1
4	Subtract single digit numbers	Y1
5	Subtract single digit numbers from numbers up to 20	Y1
6	Add a two-digit number and 1s	Y2
7	Add a two-digit number and 10s	Y2
8	Add a pair of two-digit numbers	Y2
9	Subtract a two-digit number and 1s	Y2
10	Subtract a two-digit number and 10s	Y2
11	Subtract a pair of two-digit numbers	Y2
12	Use the inverse relationship to solve missing number problems	Y2
13	Add numbers mentally, including: a three-digit number and 1s, 10s or 100s	Y3
14	Subtract numbers mentally, including: a three-digit number and 1s, 10s or 100s	Y3
15	Add numbers with 3 or more digits using a formal written method	Y3
16	Subtract numbers with 3 or more digits using a formal written method	Y3

Key Skills: Multiplication & Division

1	Double numbers up to 10	Y1
2	Halve numbers up to 20	Y1
3	Calculate and write mathematical statements using the (X) and (=) signs, using tables they know	Y2
4	Calculate and write mathematical statements using the (+) and (=) signs, using tables they know	Y2
5	Calculate mentally 2-digit times 1-digit numbers	Y3
6	Divide numbers going beyond 12 times the number using the tables that they know	Y3
7	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	Y4
8	Use known multiplication facts to calculate division with remainders	Y4
9	Identify multiples and factors of a number, and use the vocabulary of common factors and prime numbers	Y5
10	Multiply numbers of up to 4 digits by a two-digit number using a formal written method	Y5
11	Divide numbers of up to 4 digits by a one-digit number using a formal method	Y5
12	Divide numbers of up to 4 digits by a two-digit number using a formal method	Y6

Key Skills: Fractions

1	Recognise and find half or a quarter of an object, shape or quantity	Y1
2	Recognise, name and find $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a shape, set of objects or quantity.	Y2
3	Find and write fractions of amounts including unit and non-unit fractions with small denominators	Y3
4	Add and subtract fractions with the same denominator	Y4
5	Recognise and find equivalent fractions	Y4
6	Recognise mixed numbers and improper fractions and convert from one to the other	Y5
7	Use common factors to compare and order fractions	Y5
8	Add and subtract fractions with denominators that are multiples of the same number	Y5
9	Use common factors to simplify fractions	Y6
10	Multiply a proper fraction by a whole number	Y6
11	Multiply pairs of proper fractions	Y6
12	Divide fractions including fractions by whole numbers, whole numbers by fractions and pairs of fractions.	Y6

Key Skills: Decimals & Percentages

1	Recognise that decimals come from splitting ones into smaller parts and count up or down in tenths	Y3
2	Add numbers with one decimal place	Y3
3	Subtract numbers with one decimal place	Y3
4	Round decimals with one decimal place to the nearest whole number.	Y4
5	Recognise and count up or down in hundredths	Y4
6	Add numbers with two decimal places	Y4
7	Subtract numbers with two decimal places	Y4
8	Recognise the decimal equivalents of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$	Y4
9	Multiply and divide whole numbers and decimals by 10, 100 and 1000	Y5
10	Recognise the % symbol and know the equivalence between common fractions, decimals and percentages	Y5
11	Find percentages of amounts	Y6



- Manipulatives and representations can be powerful tools for supporting young children to engage with mathematical ideas.
- Ensure that children understand the links between the manipulatives and the mathematical ideas they represent.
- Ensure that there is a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept.
- Encourage children to represent problems in their own way, for example with drawings and marks.
- Use manipulatives and representations to encourage discussion about mathematics.
- Encourage children to use their fingers – an important manipulative for children.

All equipment needed is included in 'Grab & Go' resource kits, which mean no time is wasted hunting things down before each session. You can find out more about our resource kits here:

<https://www.numberstacks.co.uk/resource-kit>



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Ensure that teaching builds on what children already know.



- It is important to assess what children do, and do not, know in order to extend learning for all children.
- A variety of methods should be used to assess children's mathematical understanding, and practitioners should check what children know in a variety of contexts.
- Carefully listen to children's responses and consider the right questions to ask to reveal understanding.
- Information collected should be used to inform next steps for teaching. Developmental progressions can be useful in informing decisions around what a child should learn next.

Initial assessments (one for each Key Skill category) are used to identify gaps in understanding and where each child needs support. As the assessments are linked to the Key Skills Progression, it makes it easy to track progress and highlight next-steps. Each Key Skill also has its own 'Fluency-Activity' which can be used to assess understanding and confidence of each skill once completed. You can view a sample of an initial assessment here:

<https://www.numberstacks.co.uk/initial-assessments-2>

 Initial Assessment Unit: Number & Place Value		
Name: _____		Date: _____
Year group: _____		Score: _____
Begin at Key Skill 1 and work through all the questions up to and including your child's current year group (indicated in the answer section). Children should answer both question A and question B of each Key Skill. • If question A of a Key Skill is answered incorrectly, stop the assessment and begin working through the video tutorials from this Key Skill. • If either question A or question B are answered incorrectly, continue the test but consider whether it might be beneficial to recap this Key Skill using the video tutorial, depending on the error made. NB: Do not share correct answers with the child following the assessment. The way you can repeat the assessment when you have completed all the video tutorials to check their progress.		
Key Skill	Question A	Question B
KS1: Read and write numbers to 10 in numerals	What number is represented below? 	How the number is shown on the number line? 
KS2: Read and write numbers to 100 in numerals	What number is shown below? 	What number is shown below? 
KS3: Count backwards within 100 from any given number	Count backwards to ten from the number: 9	Count backwards to ten from the number: 20
KS4: Identify a number that is one more than the number	What number is one more than the number: 10	What number is one more than the number: 15
KS5: Order and compare numbers up to 100 using language 'more than' and 'less than'	Put these numbers in order from smallest to greatest: 12 7 3 15	Put these numbers in order from least to most: 8 1 13 11
KS6: Count on to find the number shown in the frame	Count on to find the number shown in the frame: 	Count on to find the number shown in the frame: 
KS7: Count backwards in multiples of 10 from 100	Count backwards in multiples of 10 from the number: 60	Count backwards in multiples of 10 from the number: 100
KS8: Read and write numbers to 100 in numerals, recognising the place value of each digit	What number is shown below? 	What number is shown below? 
KS9: Count backwards within 100 from any given number	Count backwards to ten from the number: 84	Count backwards to ten from the number: 51
KS10: Identify all odd and even numbers	What number is more than the number: 50	What number is more than the number: 85
KS11: Compare and order numbers from 0 to 100 using 'greater than' and 'less than'	Put the following numbers in order from smallest to greatest: 64 46 51 65 15 56	

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Use high quality targeted support to help all children learn mathematics



- High quality targeted support can provide effective extra support for children.
- Small-group support is more likely to be effective when:
- children with the greatest needs are supported by the most experienced staff;
- training, support and resources are provided for staff using targeted activities;
- sessions are brief and regular; and
- explicit connections are made between targeted support and everyday activities or teaching.
- Using an approach or programme that is evidence-based and has been independently evaluated is a good starting point.

All teaching in Number Stacks is delivered through video tutorials that are designed to be watched by a child (or small group) and supporting adult together. Activities are explained and demonstrated by James (a primary teacher with 16 years experience) before the video is paused for the child to practise what they have watched. A typical section of a video is a few minutes long so a session would usually last about 15-20 mins and should take place daily if possible, but a minimum of 3 times per week.

<https://www.numberstacks.co.uk/video-tutorials>



NUMBER STACKS CASE STUDY

Pleasant Street Primary School, Liverpool



Pleasant Street Primary have been using Number Stacks as a maths intervention to help children who were working below age related expectations (ARE). The data below covers a period from October 2020 to July 2021. Over this period, 56 pupils accessed the intervention of which 70% spoke English as an additional language (EAL) and 34% were on the SEN register. Staff used the Initial Assessments to establish a starting point for each child and then worked through the Number Stacks Key Skills, starting with the Number & Place Value category. Children had to demonstrate a secure understanding on the fluency tasks before progressing on to the next Key Skill, and only moved on to the next category of Key Skills when they had reached ARE in the current category. Frequency of sessions varied between classes with the children furthest behind having at least 3 sessions a week and those only working slightly below ARE, only one or two. The statistics below are taken from Pleasant Street's Intervention Tracking Data.

KS1 (27 Pupils)

- 100% made progress from their starting points
- 63% Caught up with ARE in Number & Place Value
- 41% Caught up with ARE in all categories and no longer needed to access the intervention
- Pupils progressed by an average of 9 Key Skills

KS2 (29 Pupils)

- 100% made progress from their starting points
- 83% Caught up with ARE in Number & Place Value
- 55% Caught up with ARE in two or more categories
- 93% Progressed by at least 10 Key Skills
- Pupils progressed by an average of 14 Key Skills

'Number Stacks has been a fantastic intervention. It has worked well as it has helped close the gaps, especially with basic skills. The resources used are good to support the children as it is a visual element to support them.' (Y1 Teacher)

'The children have really enjoyed the sessions and I think it has had an impact on their confidence in Maths. They have used their strategies in Maths lessons.' (Y2 Teacher)

'Number stacks has had a positive effect this year as children have responded well to the short lessons...The children have become more confident attempting questions in class and have improved their test results.' (Y4 Teacher)

'I like Number Stacks. It makes Maths easy because we have counters. It helps me with my maths because I remember all the things I have done in Number Stacks when we do Maths in class.' (Y4 Pupil)

'Number Stacks has been an easy intervention to complete. The resources are ready and the 'grab and go' nature of the intervention means that it is fuss free and there is no planning or resourcing needed. It has had a massive impact on pupil confidence and progress this year. The children enjoy the practical element of the sessions and we are noticing that they are using skills and strategies in Maths lessons.' (Intervention Manager)

www.numberstacks.co.uk/free-trial

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www.numberstacks.co.uk/schools

Useful Links:

EEF Guidance – Improving Maths in the Early Years & KS1:

<https://educationendowmentfoundation.org.uk/education-evidence/guidance-reports/early-maths>

Number Stacks Key Skills Progression:

<https://www.numberstacks.co.uk/wp-content/uploads/2019/02/Key-skills-pathways-edited-and-reduced-V4.pdf>

Number Stacks Free Trial (including initial assessments):

<https://www.numberstacks.co.uk/free-trial/>

Number Stacks School Packages & Case Studies:

<https://www.numberstacks.co.uk/schools/>

Number Stacks YouTube videos:

https://www.youtube.com/channel/UCEDLenKjUvungZRyzINZ_Qw/videos