

**YEAR  
TWO**



# Diagnostic Assessment Toolkit

Assessing Prior Learning in Mathematics

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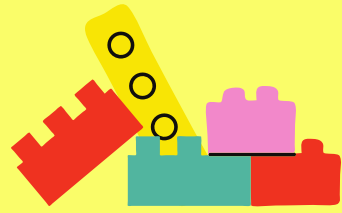
# How to Carry Out a Diagnostic Assessment

The diagnostic assessment activities in this booklet have been designed with small groups in mind, however they can be used on a 1:1 basis or with a larger group with some adaptation. There is a printable notes page at the back of this document that you can use to record your observations and next steps.



## 1. Primer

Begin by talking about the children's prior learning. Find out what the children remember, including any key words they know. If you can, look at examples of their previous work.



## 2. Build it, draw it...

Move on to a task involving models and images. Ask the children to find, make or draw an example of the key concept or word. Use practical equipment, if it's relevant to do so.



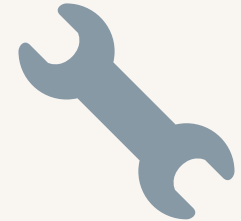
## 3. Reasoning and comparing

Asking children to explain their thinking can provide an insight into their conceptual understanding and use of key words. Comparison activities provide a good opportunity for this.



## 4. Inform planning


Use what you have found out to inform your planning. Some children may require support before the topic begins, whilst others may need to spend longer on one or more small steps.




## Supporting resources

An accompanying PowerPoint presentation has been created to be used alongside this toolkit so that you can present the questions to the children on a screen, if you wish.


# Features of the Diagnostic Toolkit




**Prior learning and key vocabulary:** At the start of each section there is a brief description of what the children will have learnt about previously and how this links to the new content that will be taught this year. It's recommended that teachers use this alongside the statutory and non-statutory guidance in the national curriculum. For each topic there is also list of key words. Although the children may not know all of these words yet, they should be aware of most of the words in this list. If not, it is recommended that you revisit or teach these words before introducing new words.



**Common misconceptions:** This list contains several common misconceptions and barriers to progress related to this topic. If a child has one of these misconceptions or barriers to progress, and they are not addressed, it is likely that they will have greater difficulty understanding the new concepts you are planning to teach. Therefore this section can help you to know what to look out for when carrying out the diagnostic activities. Most of the misconceptions in this toolkit link to previous learning from last year (or earlier), however some other misconceptions included in the list may arise during this topic if a child misunderstands the key concepts or procedures when they are introduced. Please be aware that this list is not exhaustive and doesn't include all of the possible misconceptions that could arise. If you think that a child demonstrates a misconception that is not on the list for your year group, it could be highlighted in the diagnostic toolkit for another year group - where it may be more commonly found.



**Addressing misconceptions:** This section provides advice for helping you to address some of the highlighted misconceptions and barriers to progress. This section can inform planning for whole class teaching, pre-teaching or interventions. If references have been made to methods or representations that you do not use in your school, such as bar models perhaps, please consider how you might adapt the suggested approach, representation or method that you use in your setting.



**Diagnostic activities:** These pages in the toolkit contain suggestions for activities and questions that you can use to find out about children's understanding of prior learning. The tasks have been designed to be used with small groups, but they could be adapted for larger groups of children or if you intend to use them on a 1:1 basis. Some of the questions require the use of diagrams or other images, examples of which have been provided in the accompanying PowerPoint presentation. In addition to the list of suggested activities, each page contains a picture of the questions and activities with annotations. The annotations are designed to support the adult leading the activity, including suggestions for things to look out for and possible adaptations. Read the section called *How to carry out a diagnostic assessment* before using these activities.

# Year Two

## Place Value and Number

### Prior Learning

In Year 1, children are likely to have been taught to read and write numbers from 1 to 20 in numerals and words; and read, write and count to 100 with numerals. They identify and represent numbers using objects and pictorial representations and use the language of comparison.

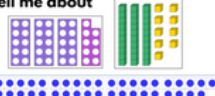
### This Year

In Year 2, children will build on this learning by reading and writing numbers to at least 100 in numerals and words and counting in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward. They should recognise the place value of each digit in a two-digit number, compare and order numbers from 0-100 using the comparison signs, and use place value and number facts to solve problems.

**Key vocabulary:** place value, digit, one-digit, two-digit, three-digit, ones, tens, hundreds, number names to at least one hundred, 'teens' numbers, represent, partition, odd/even, greater than, more than, less than, fewer than, the same as, most, least and fewest.

### Place Value and Number



<p><b>Tell me about</b></p>  <p><b>Show me</b> Can you show me these numbers (with equipment)? 12 fourteen 37 sixty 73</p>	<p><b>Read it</b> Can you read these numbers? 17 26 40 71 68 104</p> <p><b>Write it</b> Can you write these numbers? (read them aloud to the pupil) 18 50 45 23 90 102</p>
<p><b>Sort it</b> Are these numbers odd or even? 15 46 7 29 30 18 32 4</p> <p>How do you know?</p>	<p><b>Compare it</b></p> <p>Who has the most sweets? Who has the fewest sweets? How do you know?</p> <p>Which number in each pair is the greatest? 15 24 19 17</p> <p>Which is the lowest number in each pair? 46 64 42 46</p> <p>How do you know?</p>

## Common Misconceptions

Some pupils may:

- Not recognise the significance of the position of digits in a number and may say the two digits separately when reading a number, e.g. – “two seven” or “two and seven” for 27
- Read or write the ones digit before the tens or hundreds digits (e.g. – “seventy two” for 27)
- Confuse the ‘teen’ and the ‘ty’ numbers (e.g. – they may read ‘15’ as ‘50’ or vice versa)
- Reverse their digits
- Think that 30 is odd because ‘3’ is odd


## Addressing Misconceptions

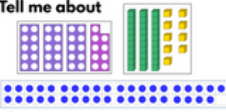
- Emphasise the correct use of relevant mathematical language.
- Use manipulatives to represent numbers. Ask questions like, “what’s the same and what’s different?” to encourage children to look carefully at and compare quantities of objects and numbers (e.g. – show them 14 and 40 represented with *Numicon* or use Base Ten to make the number 105. How many hundreds are there? Tens? Ones?).
- Always provide the abstract representation (i.e. – the number written in digits) with the concrete representation.
- Focus on the difference between -ty and -teen numbers by emphasising the differences verbally and visually, e.g.: fourteen = four and ten, forty = four tens).
- Provide children with number strips to refer to when recording numbers. Ask them to check their own/a partner’s work. Have they reversed any digits?
- *Numicon* can be particularly useful when teaching children to recognise odd and even numbers.

## Diagnostic Activities

- **Tell me about** - Ask children to talk about numbers represented in different ways, e.g. 39 shown with *Numicon*, Base 10, tens frames etc. Can they identify the number represented?
- **Show me** - Ask children to 'build' numbers to 20 and then to 100. Later, include numbers over 100, particularly those which include 0 (e.g. 105).
- **Read it** - Show children numbers written in digits and ask them to name them aloud.
- **Write it** - Read some numbers to children and ask them to write them in digits.
- **Sort it** - Can children sort given numbers into those which are odd and those which are even?
- **Compare it** - Can children compare two given numbers and quantities of objects?

Check that children are familiar with the representations used before carrying out the activities.

**Place Value and Number** 

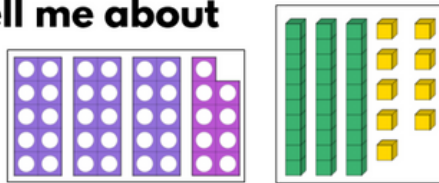
<p><b>Tell me about</b></p>  <p><b>Show me</b> Can you show me these numbers (with equipment)? 12 fourteen 37 sixty 73</p>	<p><b>Read it</b> Can you read these numbers? 17 26 40 71 68 104</p> <p><b>Write it</b> Can you write these numbers? (read them aloud to the pupil!) 18 50 45 23 90 102</p>
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Check -ty and -teen numbers and numbers which include 0 in particular.

When children are deciding whether numbers are odd or even, check that they are not basing any decisions on the tens digit.

# Place Value and Number

**Tell me about**



**Show me**

Can you show me these numbers (with equipment)?

**12** fourteen **37** sixty **73**

**Read it**

Can you read these numbers?

**17**      **26**  
           **40**  
**71**      **68**  
**104**

**Write it**

Can you write these numbers?  
(read them aloud to the pupil)

**18**      **50**  
           **45**  
**23**      **90**  
**102**

**Sort it**

Are these numbers odd or even?

**15**      **46**      **7**      **29**  
           **30**      **18**      **32**      **4**

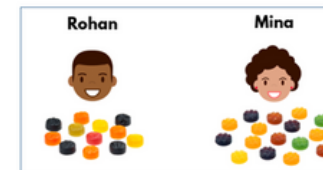
How do you know?

**Compare it**

Who has the most sweets?

Who has the fewest sweets?

How do you know?



Which number in each pair is the greatest?

**15**   **24**  
**19**   **17**

Which is the lowest number in each pair?

**46**   **64**  
**42**   **46**

How do you know?



## **Acknowledgements**

The authors would like to thank colleagues and pupils from The Bellbird Primary School, Isleham CE Primary School, St Philip's CE Primary School and Spring Meadow Infant School for providing their feedback on the first draft of the Year 1 Toolkit.

**Credit:** Some images of manipulative resources were created using [mathsbot.com](http://mathsbot.com) - created by Jonathan Hall (@studymaths).

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