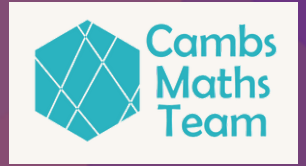


**YEAR  
ONE**



# **Diagnostic Assessment Toolkit**

**Assessing Prior Learning in Mathematics**

**Gary Casey, Becky Moseley, Tracey Sandhu  
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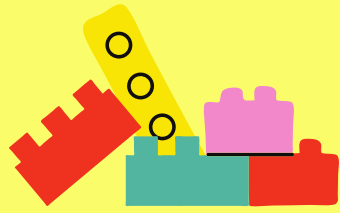
# How to Carry Out a Diagnostic Assessment

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.



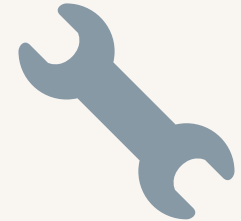
## 3. Reasoning and comparing

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 One

## Place Value and Number

### Prior Learning

In Reception, children are likely to have experience of subitising within 5, making, representing, counting and comparing numbers within 10 and counting and using the names of numbers beyond 20.

### This Year

In Year 1, children should develop their understanding of numbers, including learning about numbers to 100. Children should count in ones, twos, fives and tens; and represent, order and compare numbers using practical and pictorial models to help them.

**Key vocabulary:** one, two, three,... (cardinal numbers) and first, second,... (ordinal numbers), odd and even, digit, ones and tens; -teen numbers; multiples of ten, part and whole, most, more, less, least, greater than, less than, equal to, and words related to counting, ordering and comparing numbers.

### Place Value and Number



<b>Show me</b> Can you show me one of these numbers? <b>7 8 9 10 11 12</b> <b>two four thirteen</b>	<b>Tell me about</b> 
<b>What do you notice?</b> 	<b>How many can you see?</b> 

## Common Misconceptions

Some pupils may:

- Appear to count confidently without understanding the value of the numbers they are counting
- Have difficulty with counting forwards and backwards without missing out numbers
- Not have an understanding of the cardinal value of a number
- Confuse -teen and -ty numbers
- Say the name of the digits in a two-digit number instead of reading the whole number, such as “two seven” instead of 27


## Addressing Misconceptions

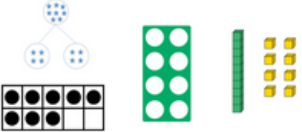
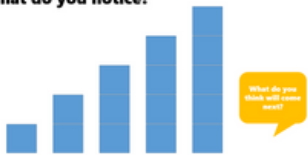

- Many children struggle with the idea that the number they say when they count the last object in a group is how many there are altogether. To help children with this we can use physical objects alongside number tracks, as this can show that ‘five’ isn’t the name assigned to the object but how many we have in total.
- To help children to compare numbers, *Numicon* tiles and ten frames can support children’s understanding of number properties.
- To support children’s understanding of two-digit numbers, use manipulatives such as bundles of straws, base 10 and *Numicon* tiles to show the difference between tens and ones.

## Diagnostic Activities

- **Show me** - Ask children to show numbers to 20. They could build it, draw it, write it or find it.
- **Tell me about** - Ask children to talk about a series of representations showing the same number alongside a different number. Ask the children to tell you about the quantity shown in each representation - are they all the same?
- **What do you notice?** - Start with a quantity and change it by adding one more or taking one away. Ask children to talk about what they notice and what they think will come next.
- **What can you see?** - Try a subitising activity with dot patterns, or simple shapes. Can children identify how many there are in each group and compare the groups?

Look out for children mis-counting, or using the wrong names for numbers.

**Place Value and Number** 

<b>Show me</b> Can you show me one of these numbers? <b>7 8 9 10 11 12</b> <b>two four thirteen</b>	<b>Tell me about</b> 
<b>What do you notice?</b> 	<b>How many can you see?</b> 

Talk about what the images show before comparing the quantity shown in each image.

Look to see if the children understand the cardinal value of the last number when counting a set of objects. If you would like to find out more about cardinality, visit [www.ncetm.org.uk/classroom-resources/ey-cardinality-and-counting/](http://www.ncetm.org.uk/classroom-resources/ey-cardinality-and-counting/).

# Place Value and Number

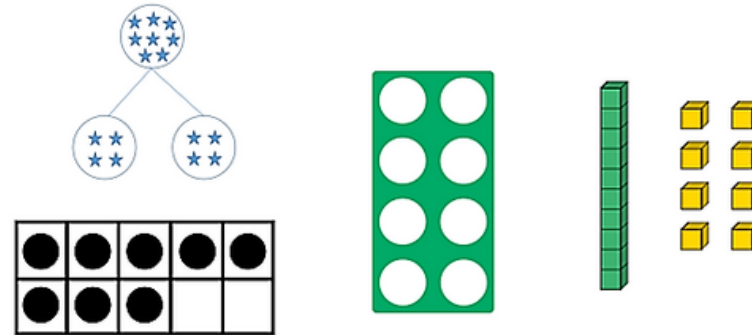
## Show me

Can you show me one of these numbers?

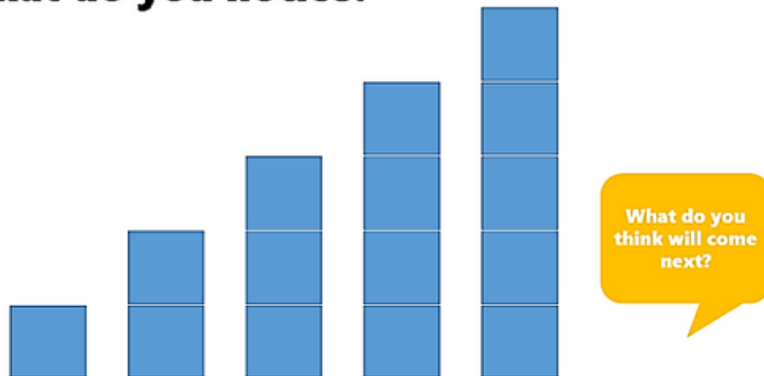
**7**   **8**   **9**   **10**   **11**   **12**

**two**   **four**   **thirteen**

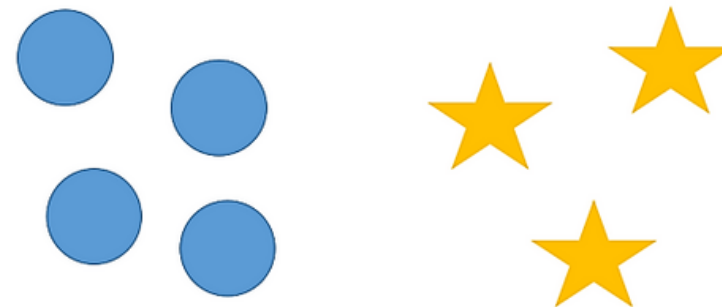
## Tell me about



## What do you notice?



## How many can you see?





## 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).

**To find out more about the Cambridgeshire Maths Team and to keep up to date with new resources, like our page on Facebook - [www.facebook.com/cambsmathsteam](http://www.facebook.com/cambsmathsteam)**