

## Notes for Unit 3: Variation

|                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Purpose of this unit:</b></p> <ul style="list-style-type: none"> <li>• Explore what variation means in the context of planning for the learning of mathematics</li> <li>• Exemplify how variation is used and planned for in lesson design</li> <li>• Support you in thinking about how you can use this in the lessons you design.</li> </ul> | <p><b>Materials in this unit:</b></p> <ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Handout 1: Questions to sort (cut into strips).</li> </ul>                                    |
| <p><b>Approximate time to complete the unit:</b></p> <ul style="list-style-type: none"> <li>• Three hours.</li> </ul>                                                                                                                                                                                                                                | <p><b>Resources needed during the session:</b></p> <ul style="list-style-type: none"> <li>• Resources to model same difference (cubes, number lines, strips of paper etc.)</li> <li>• Post-it notes.</li> </ul> |

| Suggested timings |        | Overview of the session for the leader                                                                                                                                                                                                                                                                                                                |
|-------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mins              | Slides |                                                                                                                                                                                                                                                                                                                                                       |
| 5                 | 1-4    | <p>Introductory section – slides are repeated in each unit.</p> <p>These slides show the Five Big Ideas and provide the opportunity for you to set the context for this module.</p>                                                                                                                                                                   |
| 10                | 5-7    | <p>You may want to pause and ask trainees to consider their current understanding of variation before moving on to the definitions and highlighting why variation has been focused on as a pedagogy.</p>                                                                                                                                              |
| 10                | 7-9    | <p>These slides provide the chance to show how the use of variation deepens thinking on an aspect. This is done as a non-maths example to serve as an accessible entry point.</p>                                                                                                                                                                     |
| 20                | 10-13  | <p>These slides move the thinking on to a maths example by exploring the properties of a rectangle. The discussion then unpicks why each example was chosen, relating to the concept of what is a rectangle? This example has been selected to then highlight what is meant by conceptual variation and, as a teacher, what you need to consider.</p> |

|    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | 15    | This slide is a pause for trainees to reflect on their thinking about conceptual variation and the implications for them as they move forward.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 30 | 16-24 | <p>This is the next part of the session; moving on to consider procedural variation, and identifying this as how you proceed through a lesson. This starts with a selection of questions that trainees complete and then try to identify the purpose of the questions.</p> <p>They may identify the answers are the same. The trainees then have the questions on strips to try to group/explore further what is happening in each question.</p> <p>Slide 20 provides an explanation to what can be observed in the calculations. Trainees are also asked how they could be convinced the difference remains the same – with slides from the PD materials to show some of the representations that could be used.</p> |
| 20 | 25-31 | Moving on with same difference, slide 25 shows an example of a question that may be asked to encourage children to make connections. Then the numbers are removed, and trainees are asked to apply their understanding to some true or false statements before developing their own generalisation. Slide 30 provides the opportunity to consider the range of question types and discuss how these have moved the learning on.                                                                                                                                                                                                                                                                                       |
| 10 | 32    | Pause for trainees to reflect on the messages so far.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 10 | 33-36 | These slides serve as a summary of the session, highlighting that variety is not the same as variation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 10 | 37    | This slide provides a pause for the trainees to reflect on the session and the implications for their practice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 10 | 38    | This slide provides a summary of considerations from this session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5  | 39    | The final slide makes reference to the NCETM and the work of local hubs plus some additional reading sources.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |