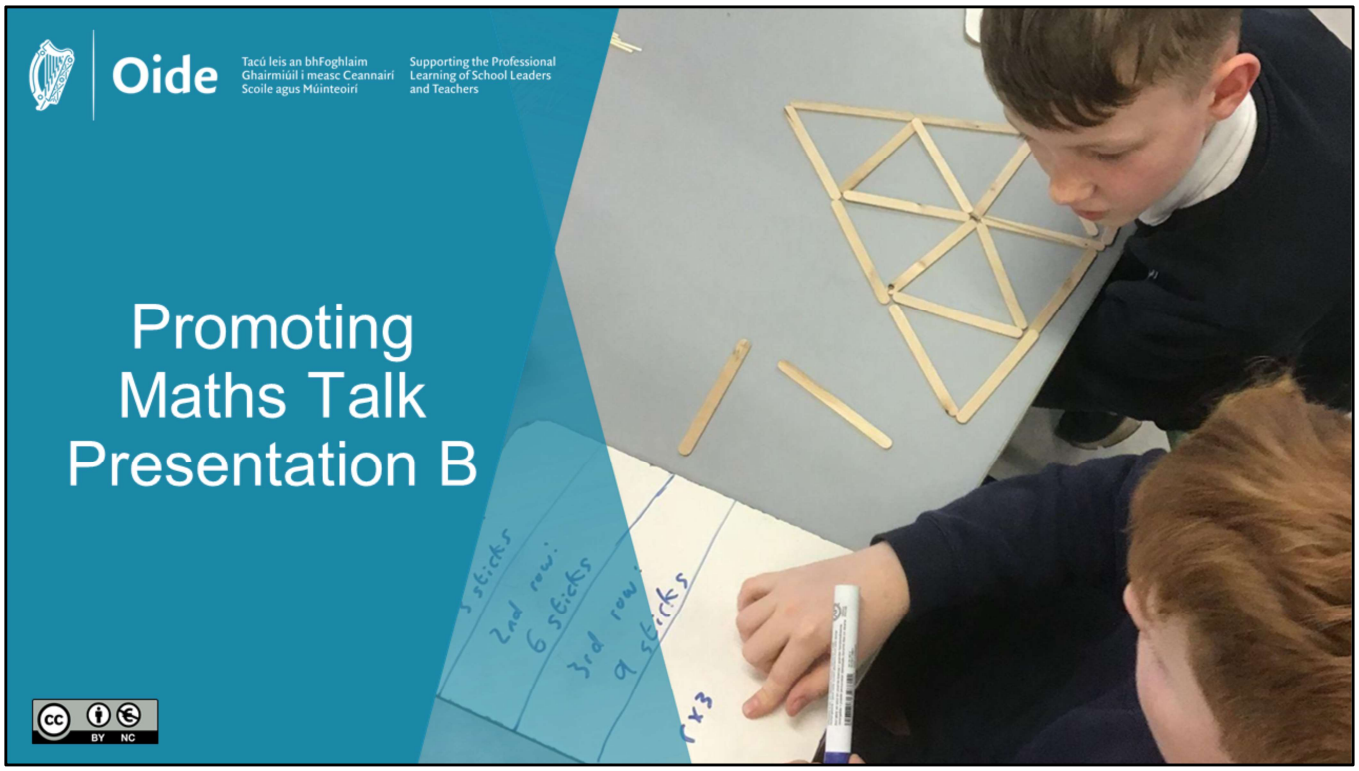


Purpose of slide:

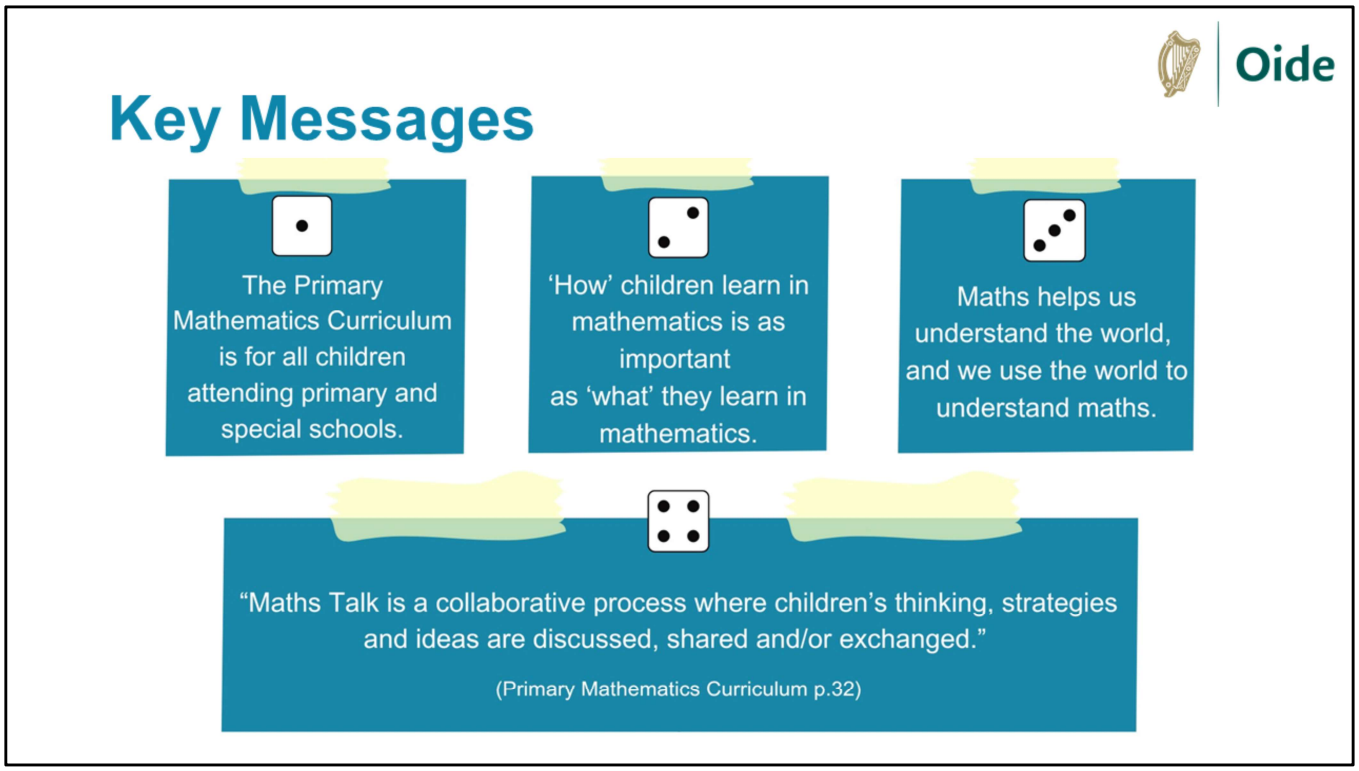
- To introduce the title of the presentation and resources needed for facilitation.

Notes for School and Curriculum Leaders:

- Organise resources needed to facilitate the presentation.

Resources required:

- Notes for facilitator
- Primary Mathematics Curriculum
- PMC Learning Journal
- Whiteboards and markers
- Selection of concrete materials for fractions (cubes, cuisenaire rods, geoboards, lollipop sticks, squared paper, fraction pieces, paper strips)
- Salt and Pepper images



Purpose of slide:

- To introduce the key messages of the Primary Mathematics Curriculum (PMC).

Notes for School and Curriculum Leaders:
Please ensure teachers have engaged with the Introduction to Primary Maths Curriculum material before exploring individual pedagogical practices.
These key messages underpin the messages of the Primary Mathematics Curriculum

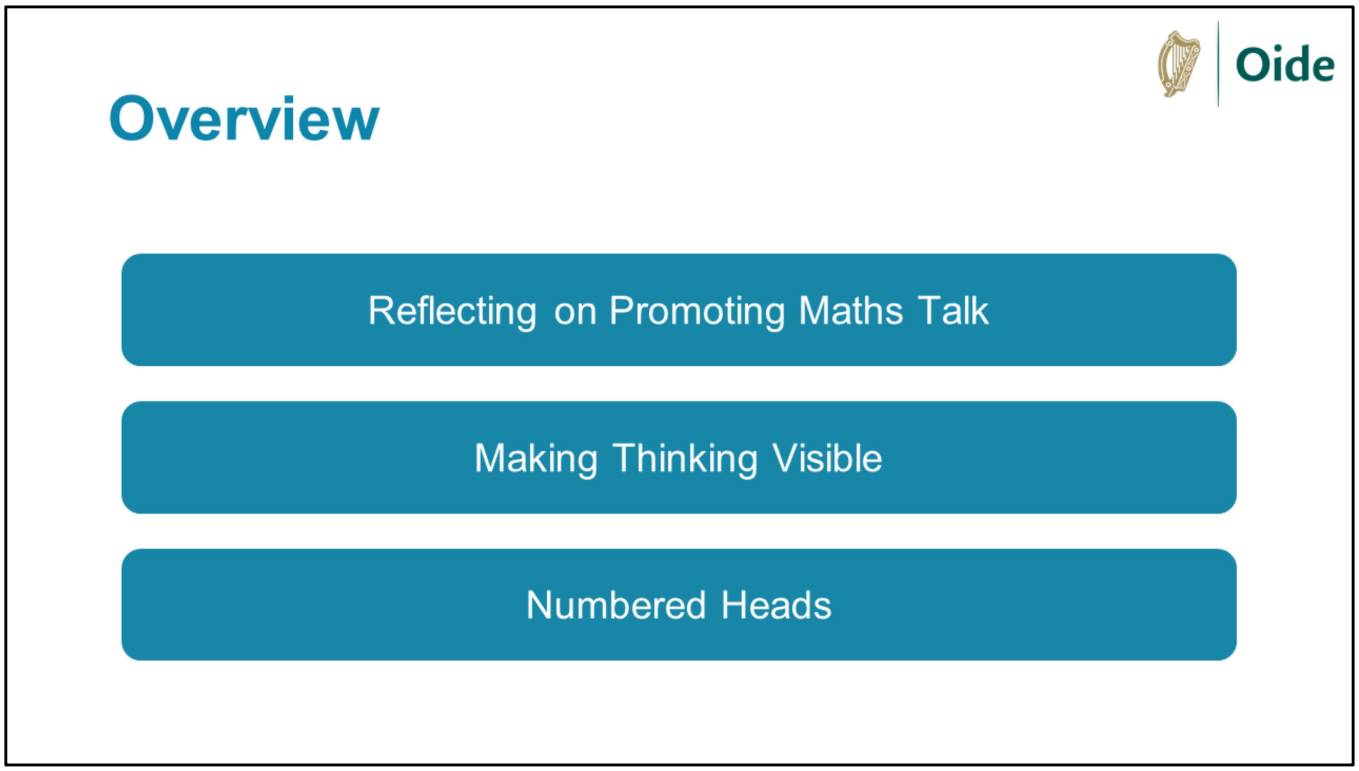
1. **The Primary Mathematics Curriculum is for all children attending primary and special schools:** Every child is capable of engaging with mathematical concepts and ideas (p.11) It supports children in realising their full potential as individuals and as members of communities and society during childhood and into the future. This takes place through high-quality learning, teaching, and assessment that is inclusive and evidence-based.
2. **'How' children learn in mathematics is as important as 'what' they learn in mathematics:** The Primary Mathematics Curriculum offers a new vision for children's learning in mathematics. The curriculum describes how children learn mathematics, and the corresponding pedagogical practices that support and enhance learning. In this presentation we will focus on how promoting maths talk

can help provide rich and meaningful maths learning experiences for children.

3. **Maths helps us understand the world, and we use the world to understand maths:** Mathematics is the study of the relationships, connections and patterns that surround us and greatly enhances our capacity to understand and engage fully with the world around us.
4. **Maths talk is a collaborative process where children's thinking, strategies and ideas are expressed, shared and/or exchanged.** This allows children to reflect on their own understanding; define, present and justify their ideas; make sense of and critique their own ideas and those of others, and develop their ability to express and articulate their thinking.

Resources required:

- None



Purpose of slide:

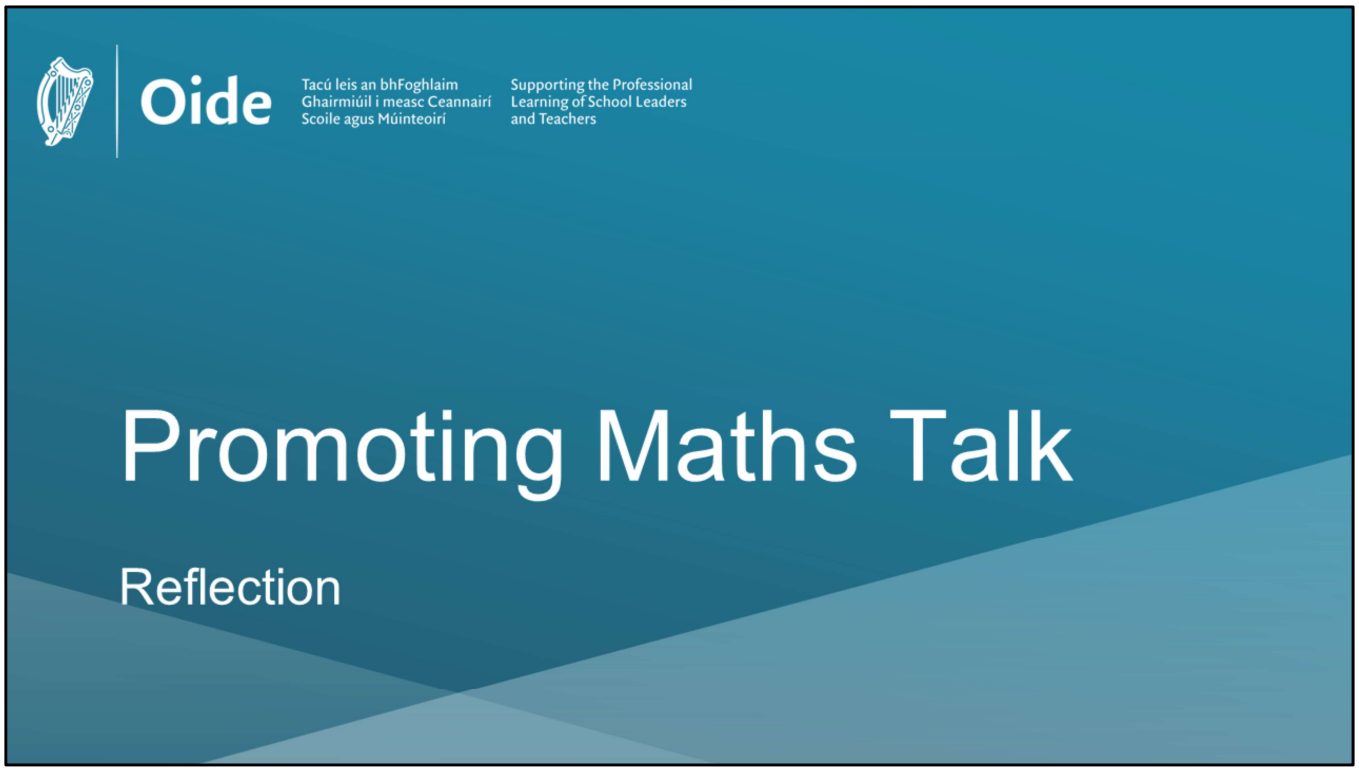
- To provide and overview of Promoting Maths Talk presentation B.

Notes for School and Curriculum Leaders:

- Read through the overview of Promoting Maths Talk presentation B
    - Teachers reflect on how they promoted maths talk in their classroom since engaging with Presentation A.
    - Teachers engage with making thinking visible using a Number Talk
    - Teachers explore structuring maths talk using numbered heads.

Resources required:

- None

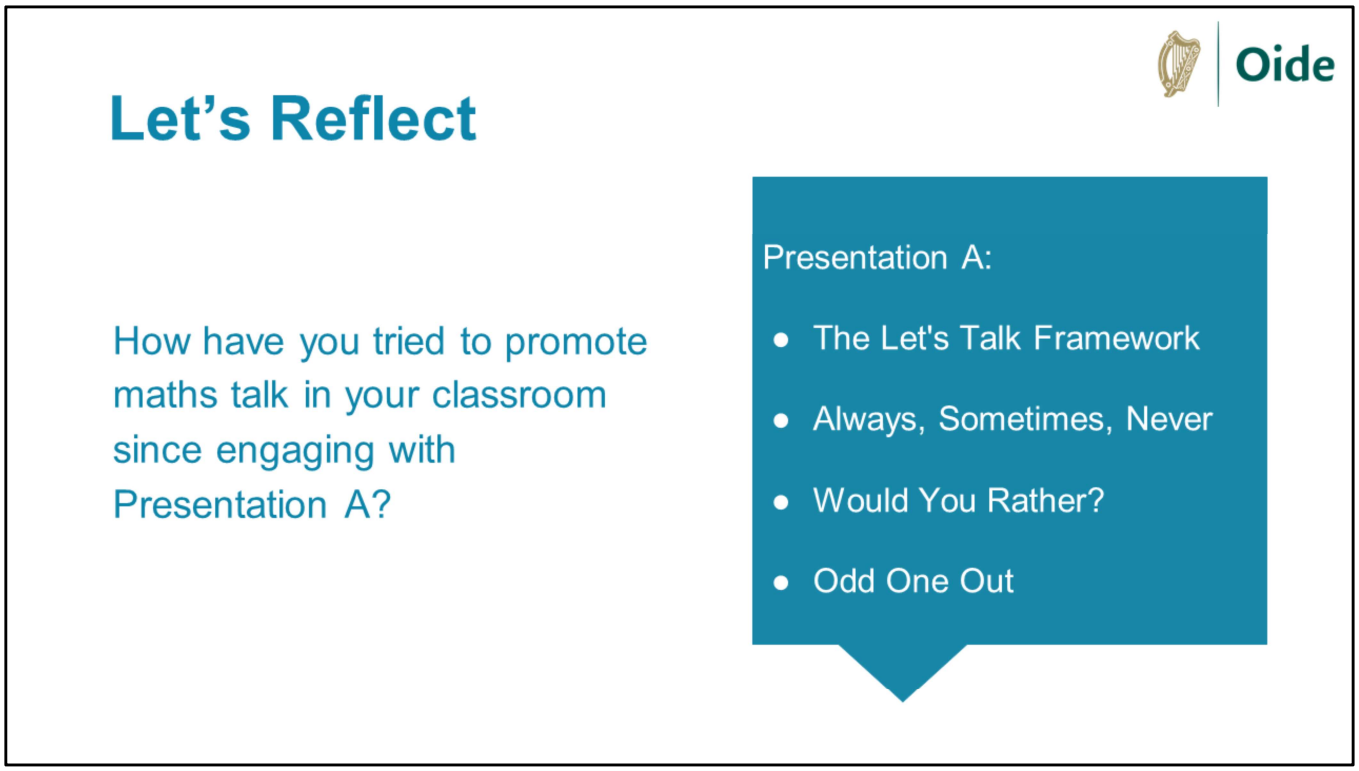


Purpose of slide:

- Breaker slide to indicate that the introduction section of the presentation is concluded and the focus will now be on teacher reflection.

Resources required:

- None



Purpose of slide:

- To reflect on actions taken from previous engagement with Presentation A Promoting Maths Talk.

Notes for School and Curriculum Leaders:

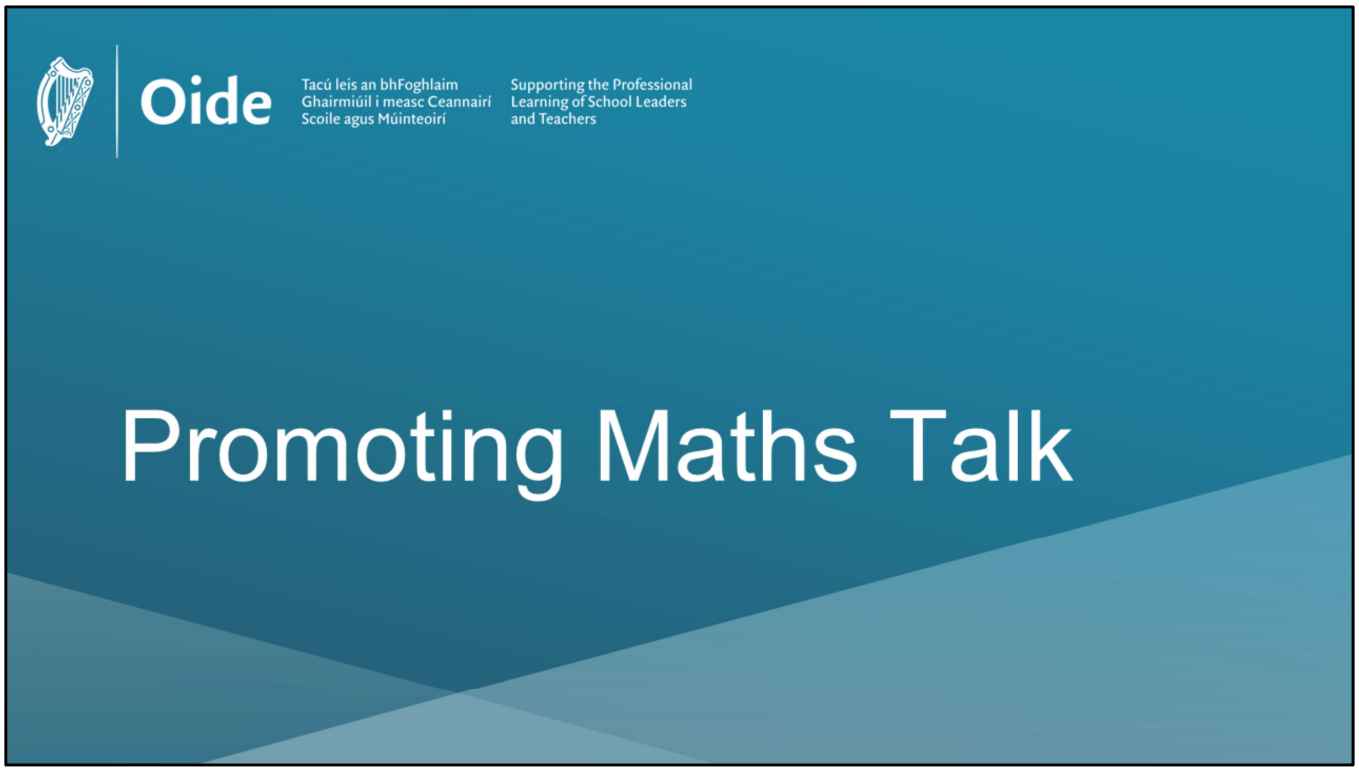
- Teachers reflect on activities they have tried since the last meeting.

Activity

- Discuss ways in which learners engaged with the elements through these activities.
- Teachers may wish to read through page 25 of the Primary Maths Curriculum to help their reflection.

Resources required:

- Primary Mathematics Curriculum page 25.



Purpose of slide:

- Breaker slide to indicate that the reflection section of the presentation is concluded and now we will begin Presentation B.

Resources required:

- None

Learning Primary Mathematics
Elements

Image from page 25 Primary Mathematics Curriculum

Presentation B:

- Making Thinking Visible
- Numbered Heads

Purpose of slide:

- To introduce the elements of the Primary Mathematics Curriculum on page 25.

Notes for School and Curriculum Leaders

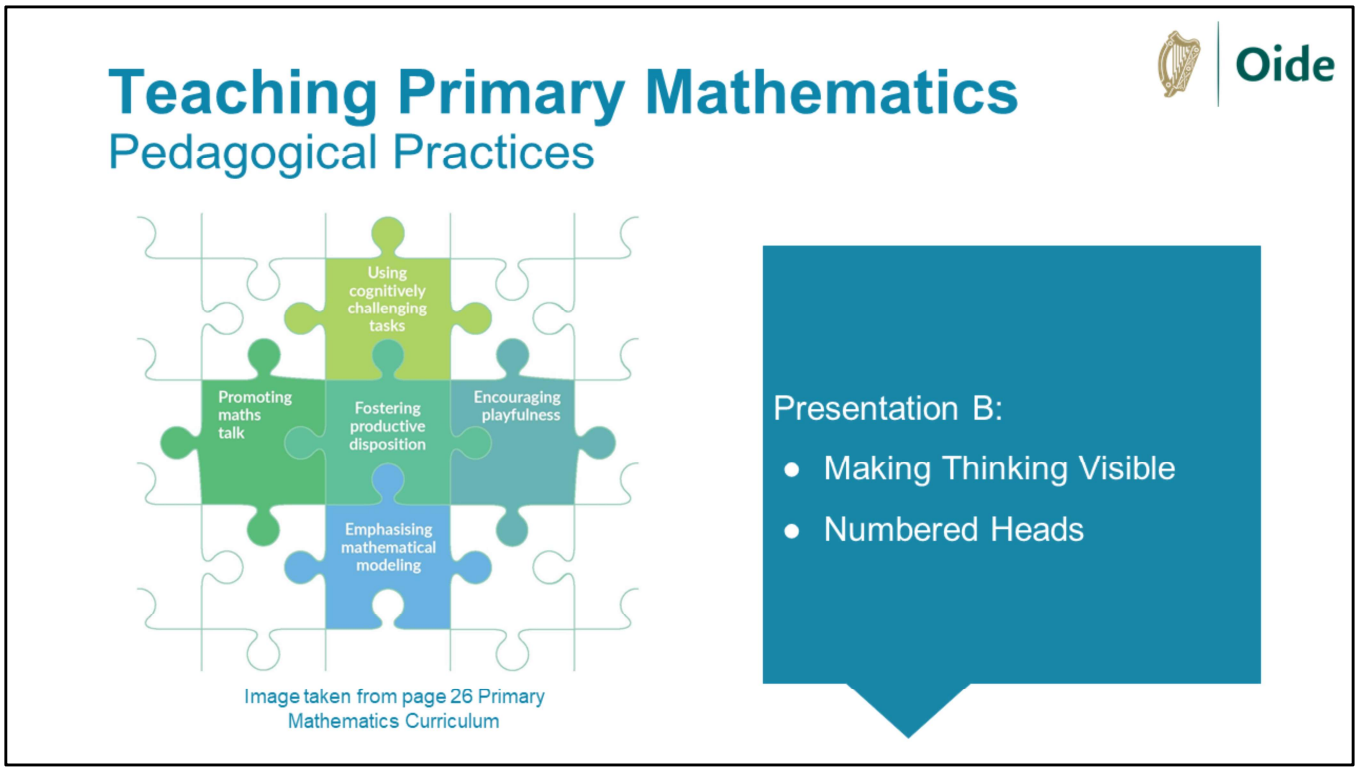
Activity

Give time for teachers to read page 25 of the Primary Mathematics Curriculum.

- Mathematical processes are categorised into four Elements: Understanding and Connecting; Communicating; Reasoning; Applying and Problem-Solving.
- The elements are the processes a child engages in as they move towards being mathematically proficient. Processes are **how** children learn. It is what you observe the children doing. Children engage with all four elements simultaneously.
- In Presentation A we looked at Odd One Out, Always, Sometimes, Never and Would You Rather activities.
- In Presentation B we will be exploring Making Thinking Visible and Number Talk.
- Throughout these presentations, teachers should reflect on the elements and how these pedagogical practices allow the elements to come to life in the classroom.

Resources required:

- Primary Mathematics Curriculum page 25.



Purpose of slide:

- To introduce the pedagogical practices of the Primary Mathematics Curriculum, one of which is promoting maths talk.

Notes for School and Curriculum Leaders:

- There are 5 key pedagogical practices outlined in chapter 6b of the Primary Mathematics Curriculum. Pedagogical or teaching practices are how the teacher provides appropriate and meaningful learning experiences for the children in their class.
- The five pedagogical practices presented on the slide are rooted in research and acknowledged as essential to the provision of quality mathematical learning experiences. 'How children learn is as important as what they learn' (Primary Mathematics Curriculum, 2023, page 26).
- The jigsaw graphic shows how these these practices are **interconnected** and naturally link with each other.
- The pedagogical practices are how the elements come to life in the classroom, you cannot have one without the other.
- Today we are going to explore strategies for promoting maths talk in our teaching.
- **It is important to note that these strategies may also be used across all 5 pedagogical practices.**

Resources required:

- Primary Mathematics Curriculum page 26 and 27

Promoting Maths Talk

Maths talk is a collaborative process where children's thinking, strategies and ideas are expressed, shared and/or exchanged.

This allows children to:

- reflect on their own understanding;
- define, present and justify their ideas;
- make sense of and critique their own ideas and those of others;
- develop their ability to express and articulate their thinking.

(Primary Mathematics Curriculum p.32)

Purpose of slide:

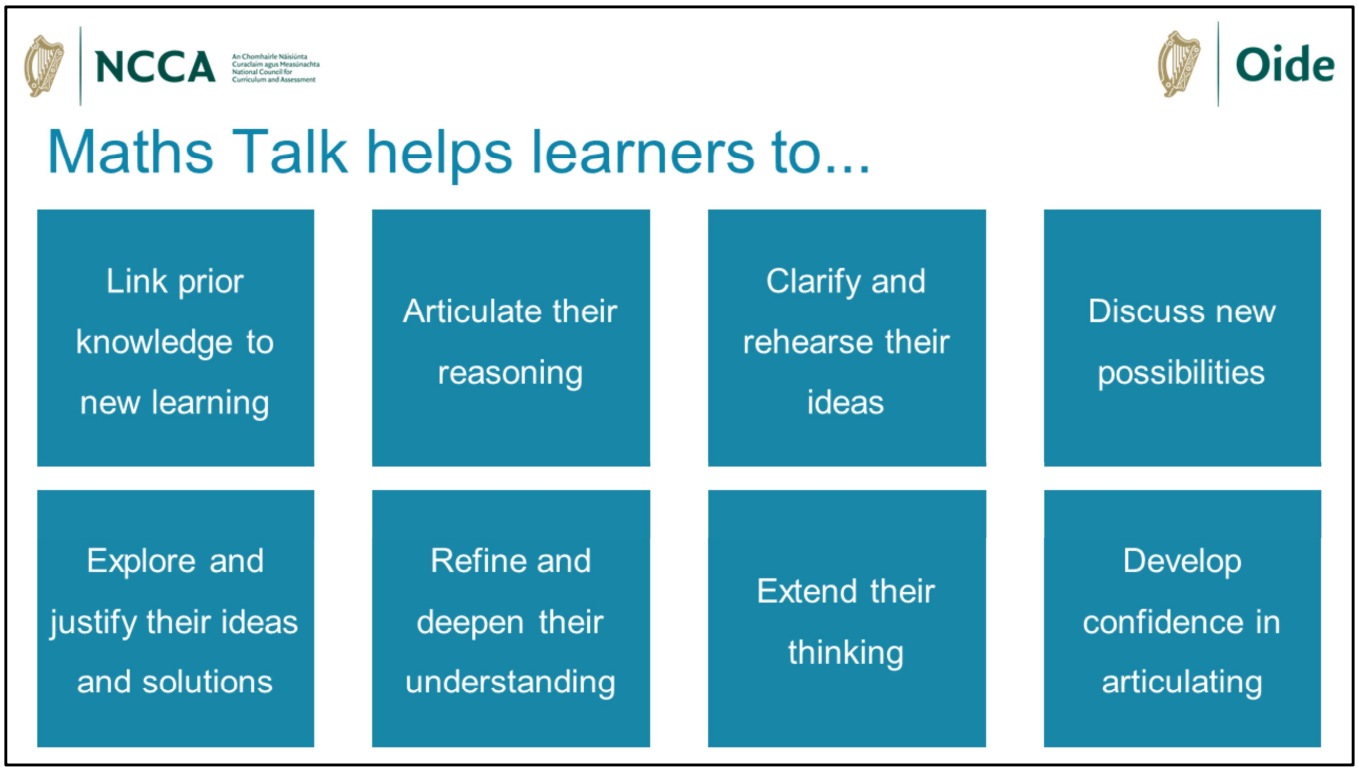
- To provide a brief description of the pedagogical practice of promoting maths talk.

Notes for School and Curriculum Leaders:

- Maths talk is a collaborative process where learners' thinking, strategies and ideas are discussed, shared and/or exchanged.
- Using Maths Talk in classrooms can help reveal learners' understanding and misconceptions.
- It can support their maths learning by boosting memory, developing maths language, promoting deeper reasoning as well as developing social skills across all subjects.
- Maths Talk helps learners to make sense of their world and they use it to understand the world.

Resources required:

- Primary Mathematics Curriculum
- PMC Learning Journal



Purpose of slide:

- To highlight the benefits of promoting maths talk as outlined by the National Council for Curriculum and Assessment (NCCA).

Notes for School and Curriculum Leaders:

- NCCA research has identified the following benefits of promoting maths talk in the classroom.
- Maths talk helps learners to:
    - elicit thinking and link prior knowledge to new learning;
    - articulate the reasoning behind their thinking;
    - clarify their thinking and rehearse their ideas;
    - discuss new possibilities and make conjectures;
    - refine and deepen their understanding;
    - explore and justify their ideas and solution;
    - extend their own thinking and the thinking of others;
    - develop confidence in articulating their ideas and misconceptions.

Resources required:

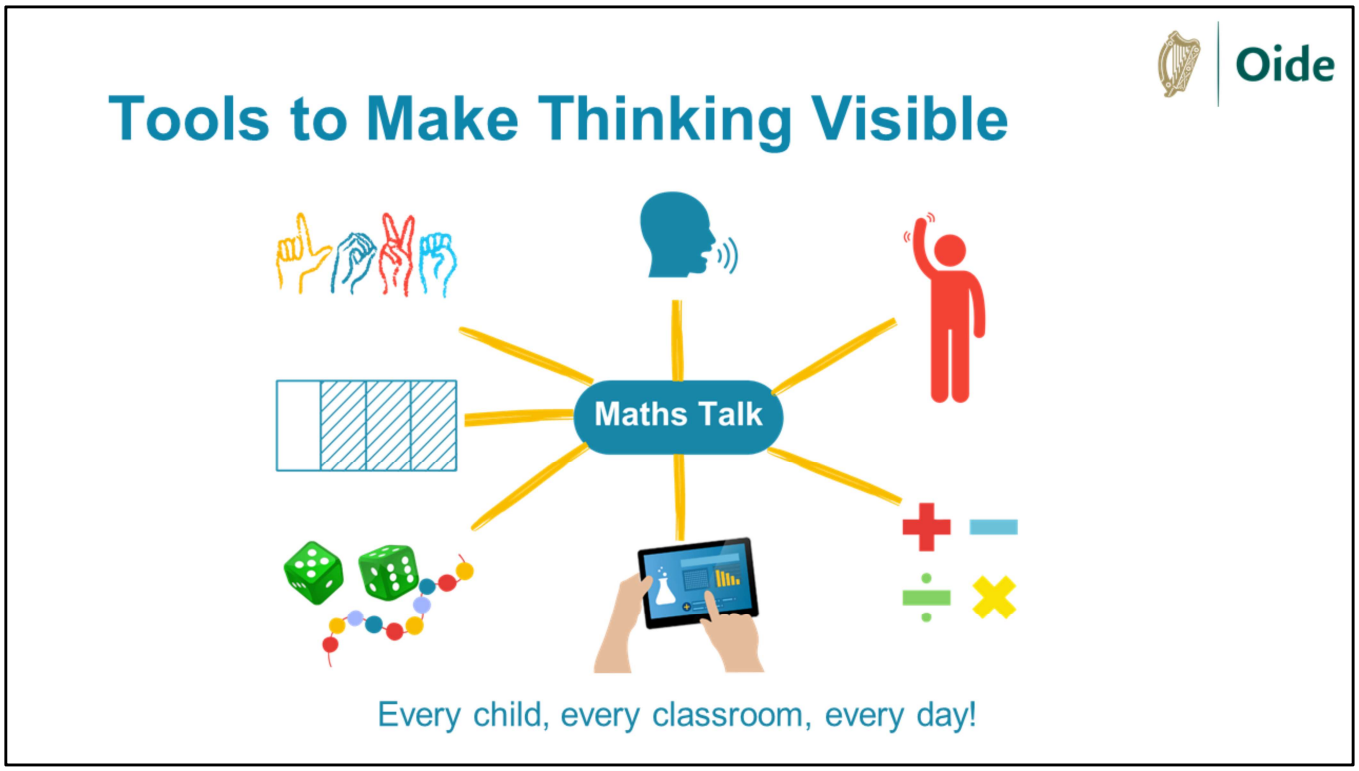
- None

Purpose of slide:

- Breaker slide to indicate that this section of the presentation is concluded and the focus will now be on Making Thinking Visible.

Resources required:

- None



Purpose of slide:

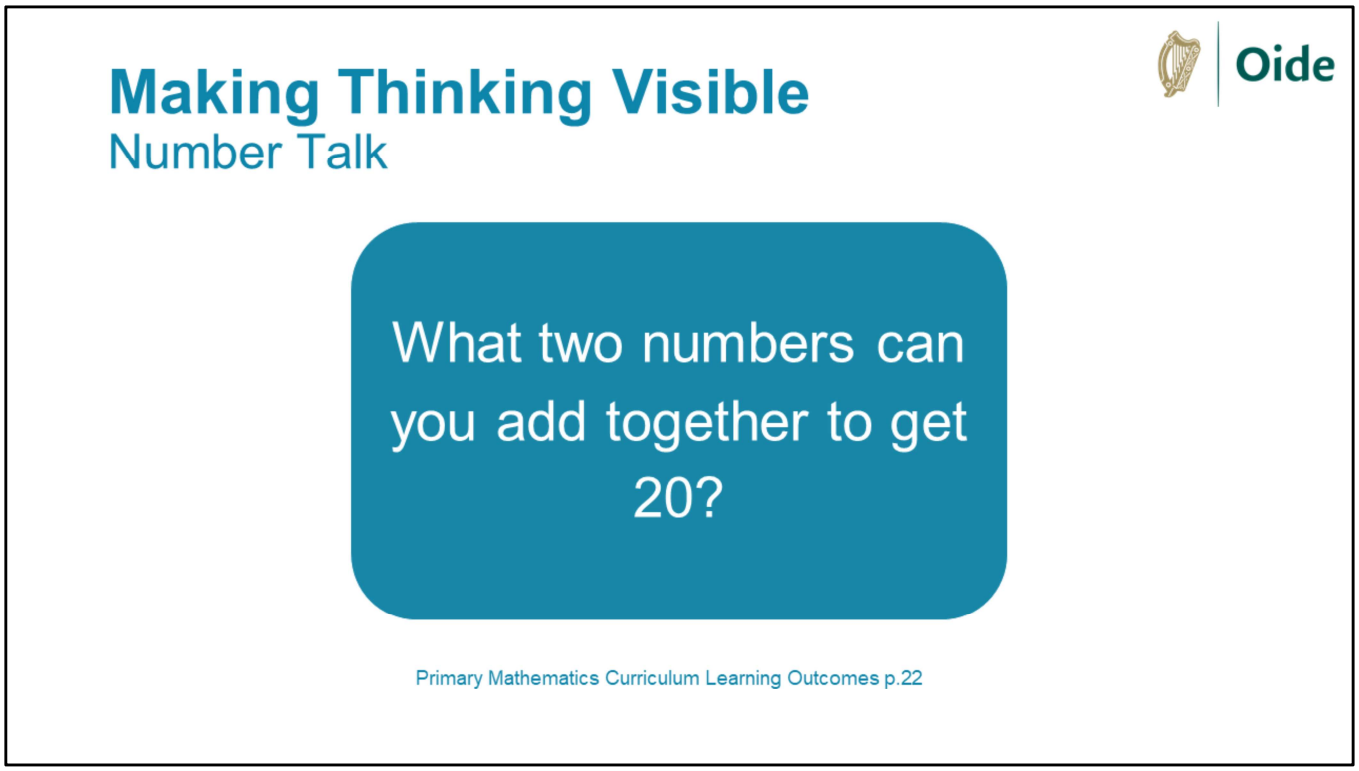
- To highlight the multiple ways to make thinking visible.

Notes for School and Curriculum Leaders:

- All children are mathematics language learners, regardless of their language proficiency and can engage in maths talk.
- Opportunities should be provided for children to communicate in ways that are meaningful for them.
- The images on the slide illustrate the tools learners can use to make their thinking visible, as outlined in the Primary Mathematics Curriculum.
- These tools can include words, body language and gestures, symbols, digital technology, concrete materials, drawings, diagrams and graphs and sign language.
- These tools help learners to understand their own thinking better and act as a support to explain their approach to their peers and teacher.

Resources required:

- None



Purpose of slide:

- To highlight the multiple ways to make thinking visible, by engaging teachers in a Number Talk.

Notes for School and Curriculum Leaders:

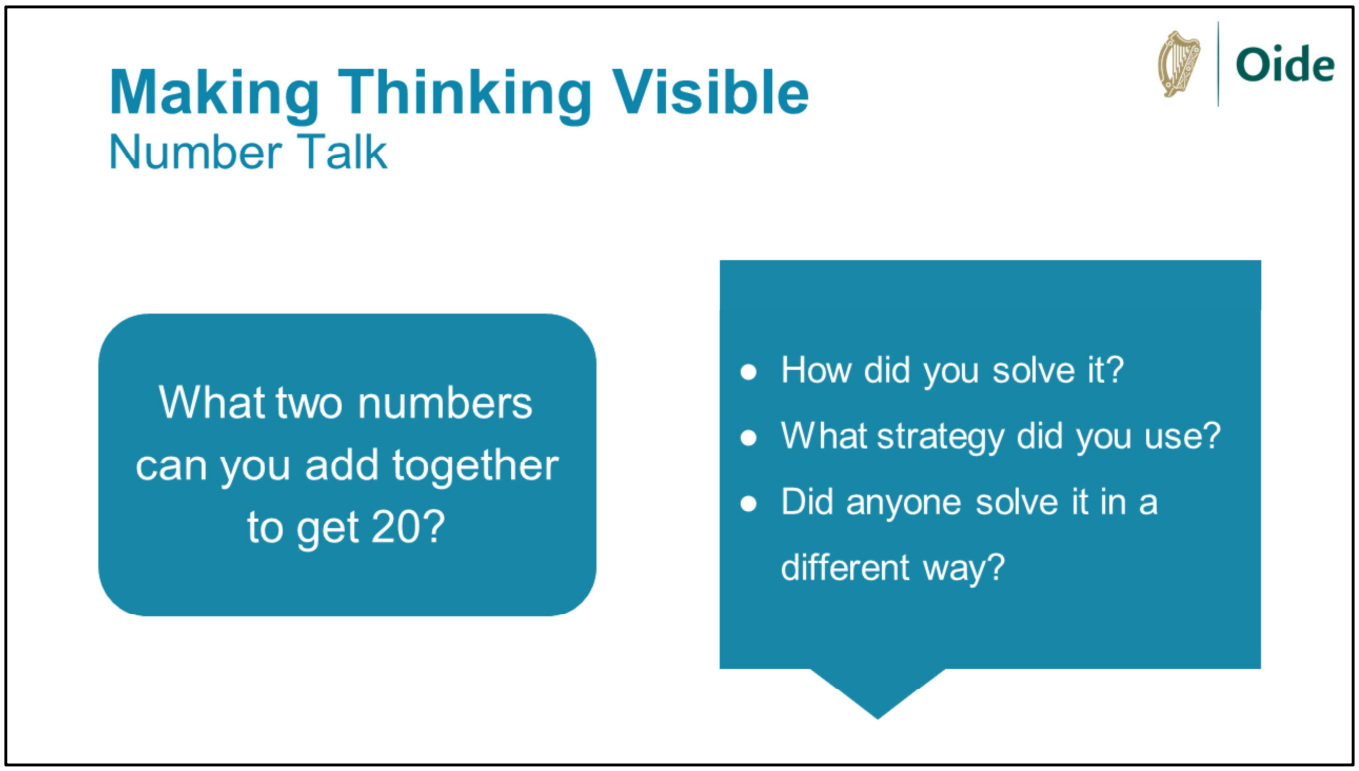
- A number talk is a short conversation (5 - 15 mins) about a maths problem that allows children to discuss and compare strategies. Number talks allow for flexibility and creativity in maths, as multiple strategies can be used to solve the problem.
- Children work on the maths problem individually.
- Children share their thinking with the class in a variety of ways including using physical actions, spoken words, objects, images (e.g., graphs, diagrams and pictures), symbols or written words.

Activity

- Teachers work on the problem from the slide and are encouraged to use tools to make their thinking visible while solving the problem.

Suggested resources:

- Whiteboards and markers
- Cubes, Cuisenaire rods, geoboards, lollipop sticks, squared paper, fraction pieces, paper strips
- Exemplars available on the PMC Hub:
    - Adding to 20 (Stage 2, Sets and Operations).
    - Adding Fractions (Stage 4, Fractions).



Purpose of slide:

- To facilitate collective sharing using the Making Thinking Visible strategy.

Notes for School and Curriculum Leaders:

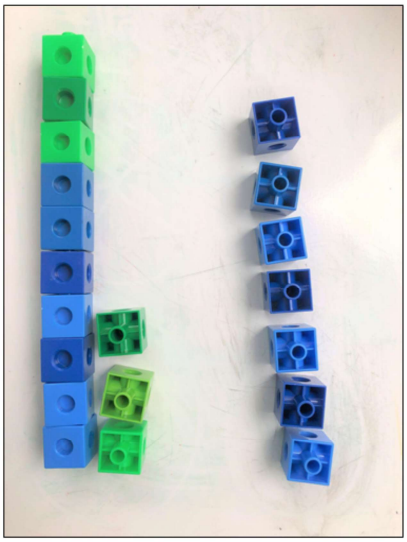
Activity:

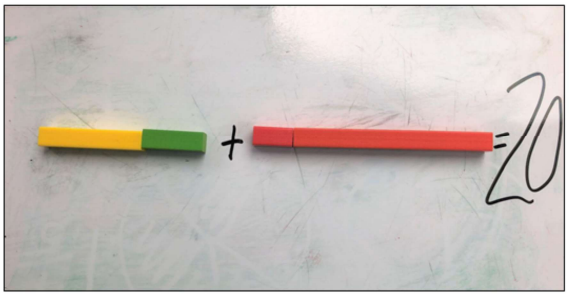
- Elicit from teachers how they solved the problem and whether or not the tool they used helped them to understand their own thinking better and served as a support when explaining their approach.

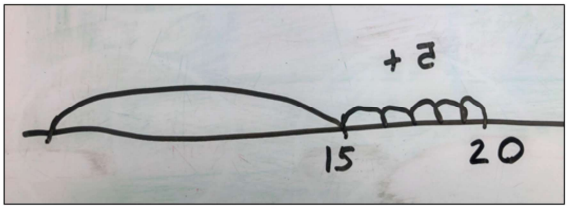
Resources required:

- None

Pupil Solutions - Adding to 20







Purpose of slide:

- To show participants examples of learners' work on the same task.

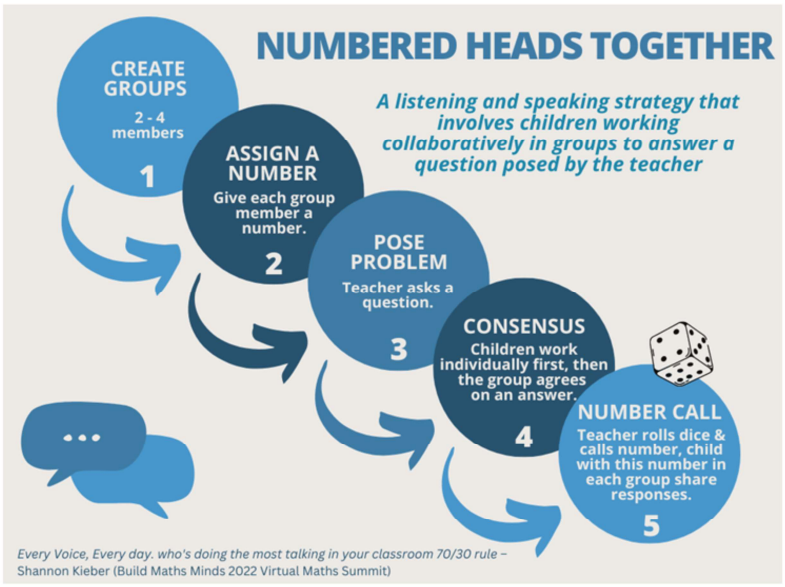
Notes for School and Curriculum Leaders:

- The work samples on screen, show some learners' responses to the exemplar Adding to 20 (stage 2, Sets and Operations), available on the PMC Hub.

Resources required:

- None

Refining Thinking Through Collaboration



Purpose of slide:

- To demonstrate the strategy of Numbered Heads to refine thinking through collaboration

Notes for School and Curriculum Leaders:

Numbered heads together is one strategy to promote maths talk.

- Numbered Heads is a listening and speaking strategy that involves learners working collaboratively in groups to answer a question posed by the teacher. It can be used to help children share, discuss and refine their thinking and mathematical models.

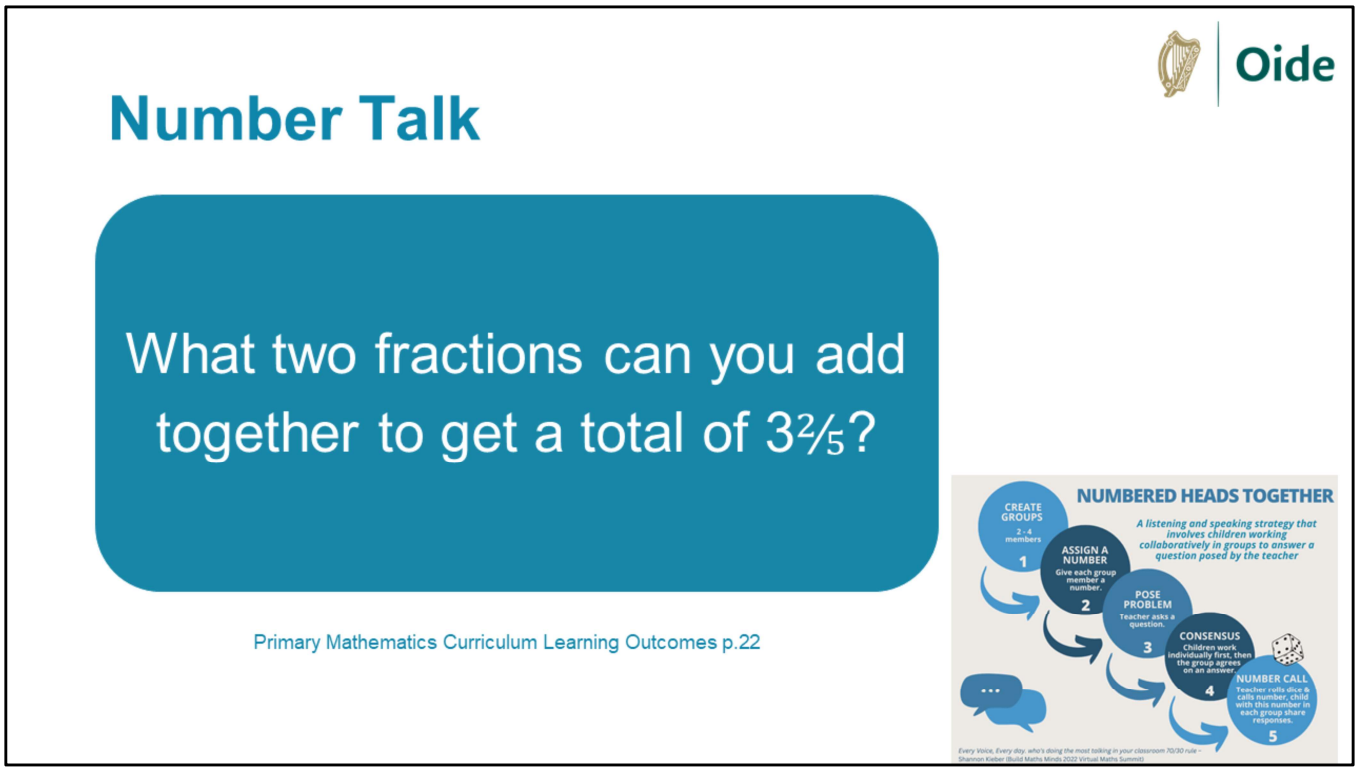
1. Create mixed ability groups of 2 – 4.
2. Assign a number to each member.
3. Pose a question either in the form of a story problem or an open ended question. These questions will allow multiple solution pathways to be explored.
4. Children work individually first and consider how they will represent their thinking to share with their group.
5. Children share their thinking within their group and are encouraged to question each other's models for clarification and further explanation.
6. Children reach a consensus on which model to share with the class. (It is important that all children understand and can explain the model chosen).
7. Teacher rolls a dice and calls the number thrown. The child with this number in

each group shares the group's response.

8. A selection of solutions is presented and discussed in the whole class setting with an emphasis on supporting children to make connections between different models and to evaluate the effectiveness of methods presented.
9. Children have opportunities to refine their models or try out the methods of others as appropriate.

Resources

- None



Purpose of slide:

- To highlight numbered heads as a way to promote collaboration in a Number Talk.

Notes for School and Curriculum Leaders:

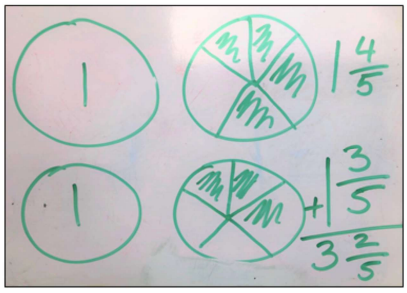
Activity:

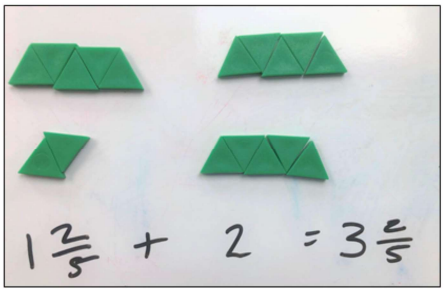
- Teachers work on the problem while implementing the numbered heads strategy.
- Teachers are encouraged to use tools to make their thinking visible while solving the problem.

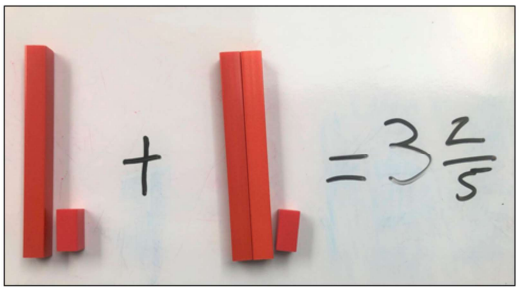
Suggested resources:

- Whiteboards and markers
- Cubes, Cuisenaire rods, geoboards, lollipop sticks, squared paper, fraction pieces, paper strips
- Exemplars available on the PMC Hub
    - Adding to 20 (Stage 2, Sets and Operations).
    - Adding Fractions (Stage 4, Fractions)

Pupil Solutions - Adding Fractions







Purpose of slide:

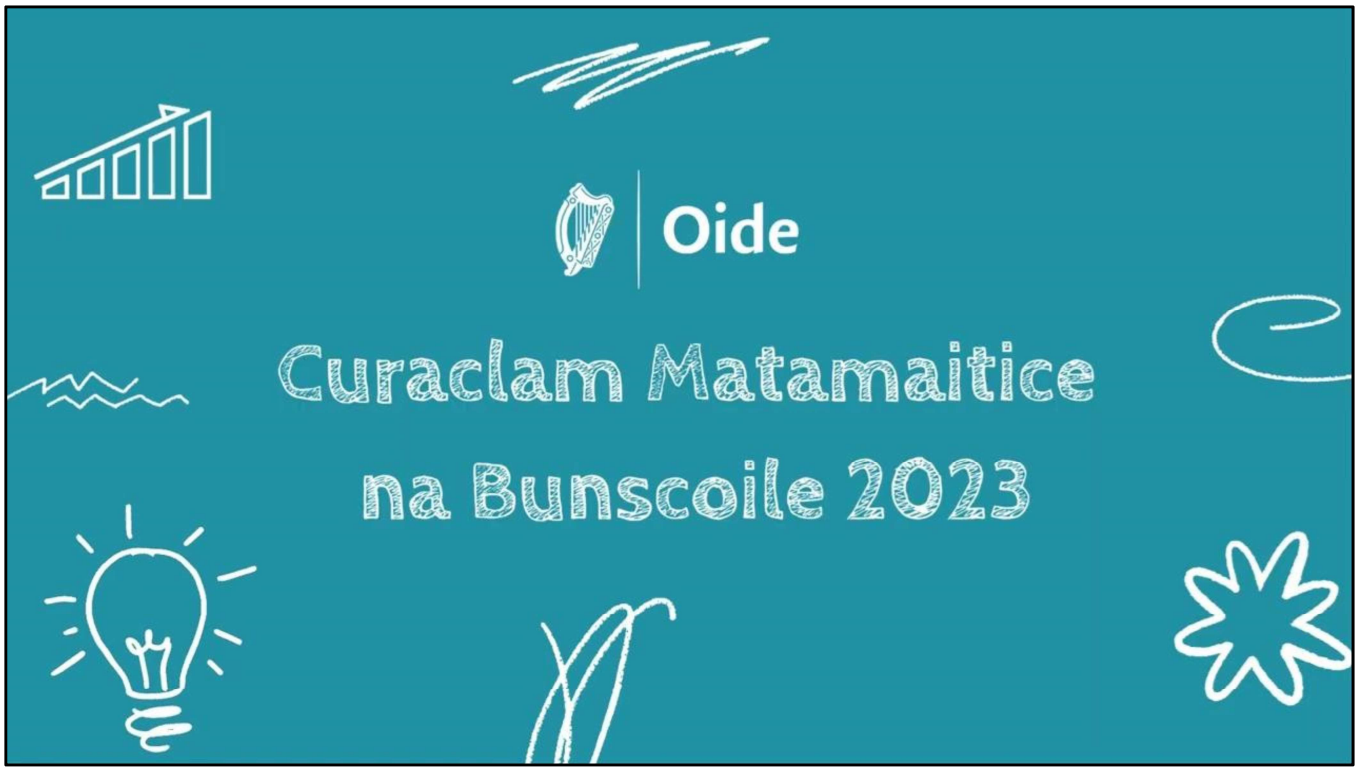
- To show participants examples of learners' work on the same task.

Notes for School and Curriculum Leaders:

- The work samples on screen, show some learners' responses to the exemplar Adding Fractions (Stage 4, Fractions).

Resources required:

- None



Purpose of slide:

- To show elements and pedagogical practices in action in Irish classrooms.

Notes for School and Curriculum Leaders:

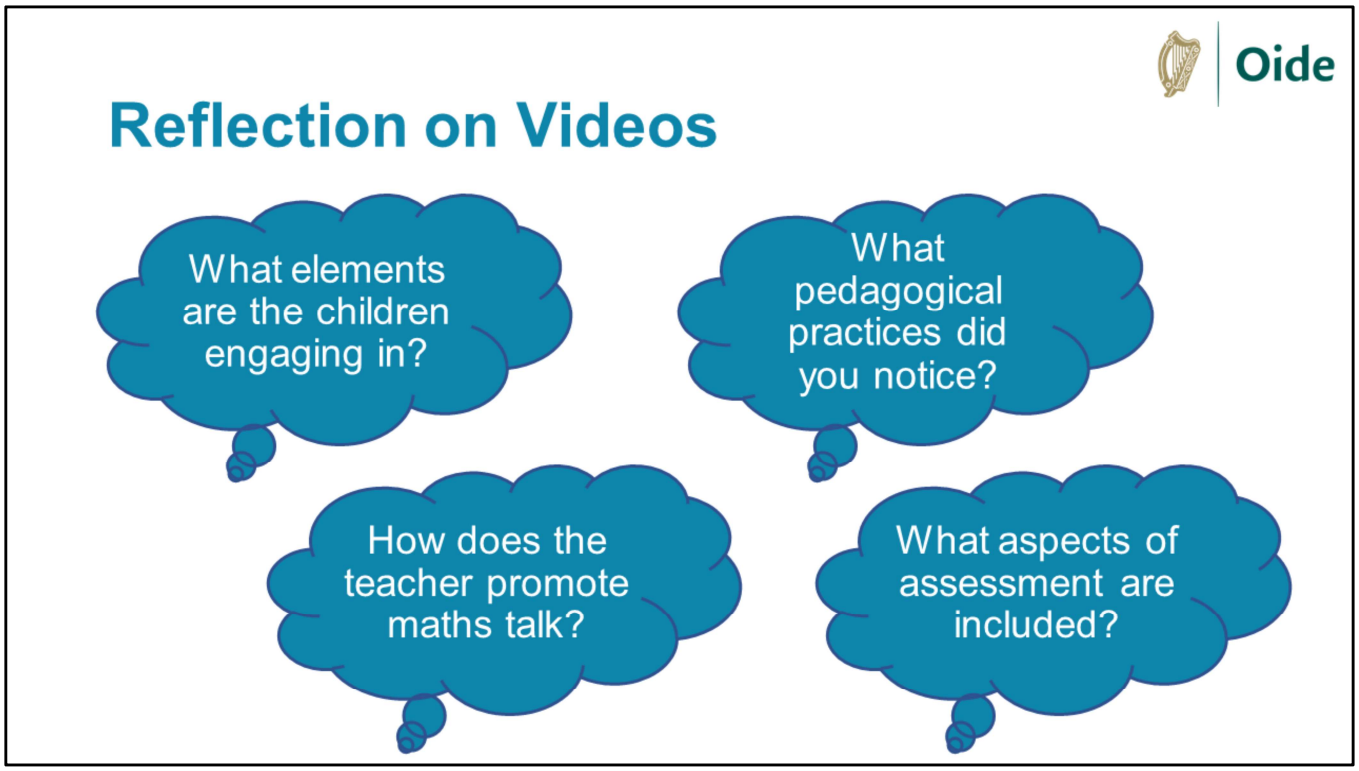
- This video shows a Number Talk in Gaelscoil Mhic Amhlaigh in Co. Galway. In this lesson, the learners share their solutions to problems where sets are combined using different strategies and concrete resources. Aspects of the Let's Talk Framework are evident throughout this video.

Activity

- The following guidelines will help you engage meaningfully with the video.
    - *Learning:* What elements are the children engaging with in this video? (See page 25 of the Primary Mathematics Curriculum for more information).
    - *Teaching:* How does the teacher prompt maths talk in this video?
    - What pedagogical practices are evident in the video? (See Chapter 6B of the Primary Mathematics Curriculum for more information).
    - *Assessment:* What opportunities are they for assessment? (See Chapter 6C of the Primary Mathematics Curriculum for more information).
    - Encourage teachers to use evidence to support their reflection, and to discuss the content of the video respectfully.

Resources required:

- None



Purpose of slide:

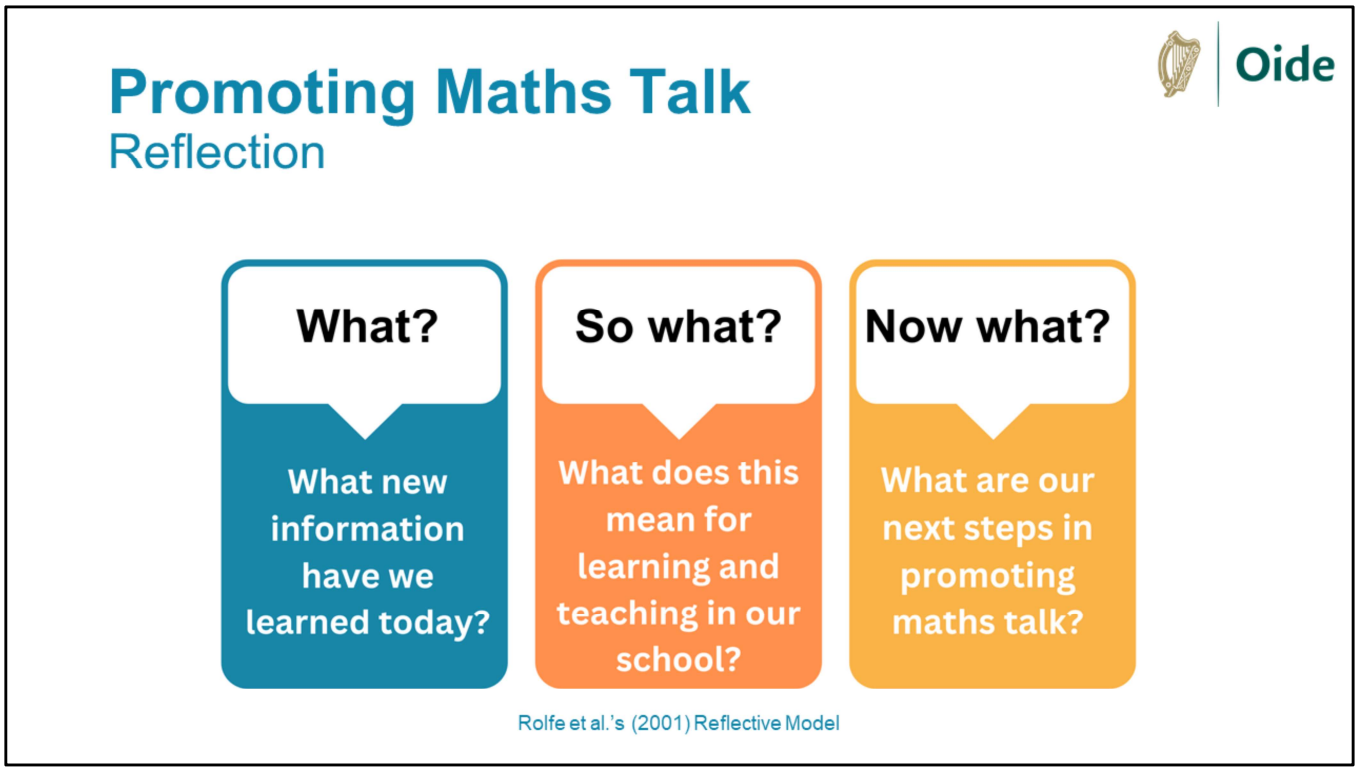
- To allow teachers time to reflect on the video.
- To facilitate group discussion on the video using the prompt questions on the slide.

Notes for School and Curriculum Leaders:

- Encourage teachers to pause and reflect on the videos they have just watched noting evidence of learning through the elements, pedagogical practices, promoting maths talk and assessment.
    - Learning: What elements are the children engaging with in this video? (See p.25 of the Primary Mathematics Curriculum for more information).
    - Teaching: How does the teacher promote maths talk? (See p.30 of the Primary Mathematics Curriculum for more information).
    - What other pedagogical practices are evident in the video? (See Chapter 6B of the Primary Mathematics Curriculum for more information).
    - Assessment: What assessment might the teacher have done in advance of teaching the lesson? (See Chapter 6C of the Primary Mathematics Curriculum for more information).
- Encourage teachers to use evidence to support their reflection, and to discuss the content of the video respectfully.

Resources required:

- None



Purpose of slide:

- To provide teachers with time to reflect and discuss key learning and to consider how they will their next steps to promote maths talk in their classroom.

Notes for School and Curriculum Leaders:

Activity:

- Teachers reflect on everything learned about maths talk today, consider its implications for pupils' learning in the school and their next steps.
    - **What?** – What are new information have we learned?
    - **So what?** – What does this mean for learning and teaching in our school?
    - **Now what?** – What are our next steps in promoting maths talk?
- Teachers record their learning in their PMC Learning Journal, and decide on their next steps to promote maths talk in their classroom.

Resources required:

- PMC Learning Journal

Micro Maths

Oide

Purpose of slide:

- To engage with Micro Maths section on the website and decide next steps for classroom practice.

Notes for School and Curriculum Leaders:

The Micro Maths Section of the website contains sample tasks and information sheets. Teachers can access these resources at any time to guide their practice.

- Teachers go to the Micro Maths section of the website to access more ideas and activities on promoting maths talk in the classroom.

Resources required:

- Device to access the PMC Hub.

Purpose of Slide:

- To close the presentation on promoting maths talk

Notes for School and Curriculum Leaders:

- Thank teachers for participating in Promoting Maths Talk Presentation B.
- Wish teachers success in implementing maths talk strategies with their learners.

Resources required:

- None