

Great Oracy Exhibition 2025

Mathematical oracy: what do we mean?

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Synopsis

Learn how the NCETM's Maths Hubs programme is developing teachers' understanding of the significance of talk in the maths classroom. In this session, Jane will share how oracy sits at the heart of a mastery approach to mathematics - which seeks to enhance all students' confidence, enjoyment and progression within the subject.

Hidden slide

Intro to Stein (10 mins)

Anticipating task (10 mins)

Plashett video (10 mins)

NCETM exemplification (5 mins)

The NCETM

The National Centre for Excellence in the Teaching of Mathematics is a DfE contract to offer professional development to all teachers of maths in state maintained schools in England. This offer is provided by the Maths Hubs programme.

Every school in England is automatically part of their local Maths Hub. Maths Hubs provide locally tailored, and bespoke support to schools seeking to improve the maths outcomes for their pupils.



The NCETM and Voice 21

Research and Innovation Work Groups

- How does Oracy relate to maths?
- What is the impact of specific oracy strategies on disadvantaged pupils' understanding of mathematics?
- How can an expert LLME's advocacy for oracy with their peer LLMEs have an impact on the hub's provision in this area?

Orchestrating Productive Mathematical Discussions

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ARTICLES

Orchestrating Productive Mathematical Discussions: Five Practices for Helping Teachers Move Beyond Show and Tell

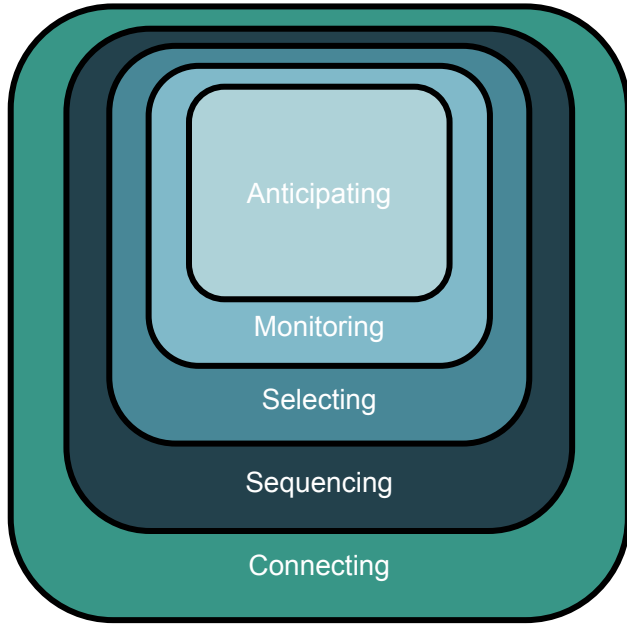
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University of Pittsburgh

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University of California, Berkeley

Margaret S. Smith
University of Pittsburgh

Elizabeth K. Hughes
University of Northern Iowa





Anticipating likely student responses to cognitively demanding mathematical tasks

Monitoring students' responses to the tasks during the explore phase

Selecting particular students to present their mathematical responses during the discuss and-summarise phase

Purposefully **sequencing** the student responses that will be displayed

Helping the class make mathematical **connections** between different students' responses and between students' responses and the key ideas.

Anticipating learner responses

Checkpoint 2: Where is one-quarter?

Where is the number $\frac{1}{4}$ on each of these number lines?



?

What value is $\frac{1}{4}$ of the way along each number line?

Checkpoint 2: Where is one-quarter? (animated solutions)

Where is the number $\frac{1}{4}$ on each of these number lines?



?

What value is $\frac{1}{4}$ of the way along each number line?

Checkpoint 16: Greater fractions

How could you decide whether the first (red) or the second (blue) fraction is the greater in each pair?

a) $\frac{11}{17}$ or $\frac{13}{17}$

b) $\frac{11}{17}$ or $\frac{11}{19}$

c) $\frac{11}{44}$ or $\frac{101}{400}$

d) $\frac{11}{37238}$ or $\frac{1}{5}$



Find a fraction that has a value in between the two fractions in each pair.

Plashett - teacher voicing the 5 practices



- What strikes you about this clip?
- What are the particular pedagogical practices you noticed? What principle(s) or feature(s) do they exemplify?
- Are there other classroom practices you've seen that enable the same principle(s) or feature(s)?



Oracy in mathematics

Oracy exemplified in The Essence of Mathematics Teaching for Mastery¹

Oracy in maths

Oracy in mathematics involves authentic listening, articulation and development of mathematical thinking. It is an essential skill that supports learning by drawing attention to mathematical structure and enabling all pupils to make connections.

How does oracy relate to maths?

Communication takes many forms and can serve many purposes. Beyond a convention, talking, listening and communication in mathematics are fundamental to enabling thinking, establishing meaning, and developing a deep understanding of key mathematical ideas.

Oracy in Mathematics

"Oracy in mathematics involves authentic listening, articulation and development of mathematical thinking. It is an essential skill that supports learning by drawing attention to mathematical structure and enabling all pupils to make connections." (NCETM 2024)



Oracy in Mathematics

Underpinning principles	
Mathematics teaching for mastery assumes everyone can learn and enjoy mathematics.	Securing greater equity in education is everyone's responsibility. Oracy is a powerful tool teachers can use to create more equitable classroom experiences. Teachers should ensure that all pupils can access the learning and have sufficient
Mathematical learning is developed successfully as learners make connections.	Through oral learning, constructing sense-making, and thinking.
Teachers continually develop their specialist knowledge for teaching mathematics, working collaboratively to refine and improve their teaching.	Teachers' understanding of oracy is a key aspect of their specialist knowledge for teaching for mastery. Teachers need to know how to create opportunities for pupil talk, be skilled in noticing significant pupil talk, and adapt lessons as a result. The teacher listens to and extends purposeful dialogue in a coherent manner to develop learning.

Oracy in the maths classroom allows for pupils to develop their sense-making, both as they explore new ideas and as they present their current thinking.

Oracy in Mathematics

Lesson design	
Lesson design links to prior learning to ensure all can access the new learning and identifies carefully-sequenced steps to ensure secure understanding.	Maths lessons reflect that sequenced learning is connected, for reasons which are made explicit and discussed during the lesson and understood by all. advance the son design.
Examples, representation carefully selected to expose mathematical concepts and connections, enabling pupils to build knowledge of mathematics.	ing and talking language of
It is recognised that practice is a vital part of learning, but the practice must be designed to both reinforce pupils' procedural fluency and develop their conceptual understanding.	Teachers design or adapt tasks which stimulate talk that harnesses learning and deepens understanding. As part of practice, pupils should have opportunities to verbalise their thinking and justify how and why.

Oracy in maths - disciplinary oracy - requires pupils to be fluent in the language of maths, and to be able to read meaning into symbolic representations.

Oracy in Mathematics

In the classroom	
In a typical lesson, the teacher leads back-and-forth interaction, short tasks, explanation, discussion, enabling pupils to apply their knowledge to	The teacher skilfully manages the discourse to address a clear learning point. Specialist knowledge, in a coherent manner. Problem-solving and sharing pupils' ideas, asking
Use of precise mathematical language enables pupils to communicate their thinking effectively.	Teachers plan for the use of mathematical vocabulary to support learning. This is shared because
If a pupil fails to grasp a concept or procedure, this is identified quickly, and gaps in understanding are addressed systematically to prevent them falling behind.	Communication is an effective tool for formative assessment, as it enables teachers to plan teaching to build on pupils' current conceptions of maths as the lesson progresses. Teachers design opportunities for pupils to communicate and to listen to what is said. This in-the-moment formative assessment directly informs teachers' decisions on how to move the learning forward to the intended learning point.

Based on what they hear pupils say, and drawing on their own specialist knowledge, they guide pupils' focus and support the building of concepts in a coherent manner.