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EQUITY IN THE MATHS CLASSROOM

BELONG, ENJOY AND SUCCEED

Oracy in the primary maths classroom

Lauren Curzon

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Introductions

Summerhill and Oracy – our journey and the impact

Strategies & resources

Reflections

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Summerhill Academy

- St, George Bristol
- Junior School
- 30 % FSM
- Higher than national average SEN
- Higher than national average EAL

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Area of excellence

The impact that oracy has had on maths learning at Summerhill Academy has been impressive. Oracy has maximised learning and has significantly shaped how maths is taught. Talk tactics in maths have been used effectively to support students to share their ideas, and interact with the ideas of others. Students are taught to reason with confidence in a culture where mistakes are a part of learning. The teachers facilitate talk amongst the class and in doing so assess understanding, identify misconceptions and probe deeper, to find out more.

Summer 2024

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The case for oracy in the maths classroom

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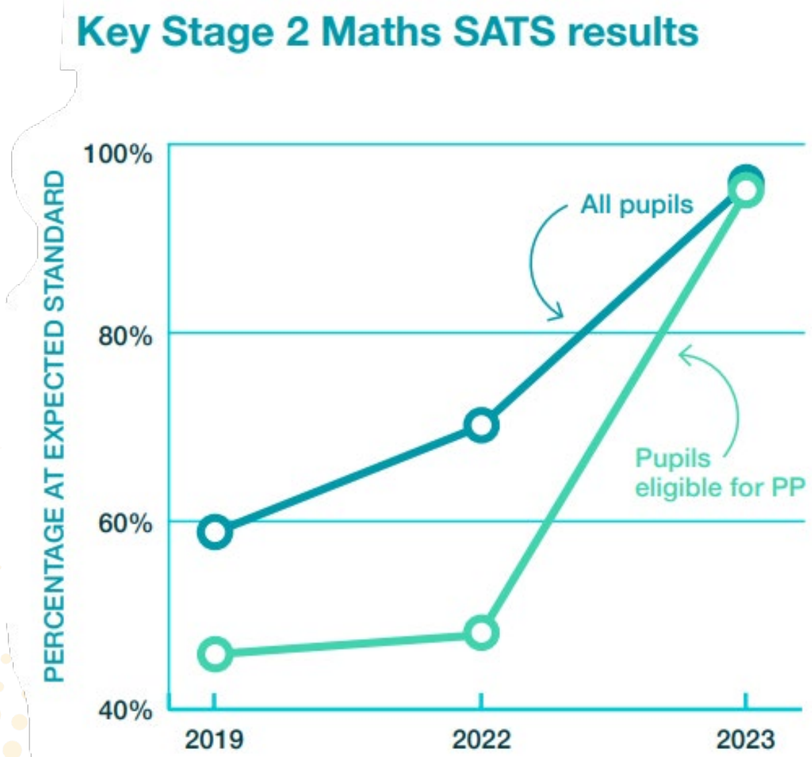
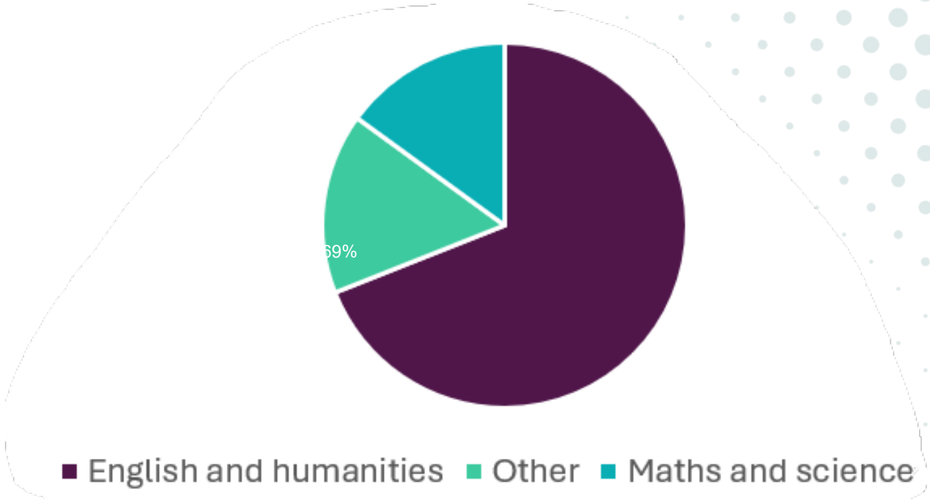
More than any other subject, mathematics has been seen as a “chalk and talk” subject with a heavy focus on you can or cannot.



Maths teachers are less likely to access professional development in oracy



Voice 21 Oracy Schools teacher survey data – secondary teachers

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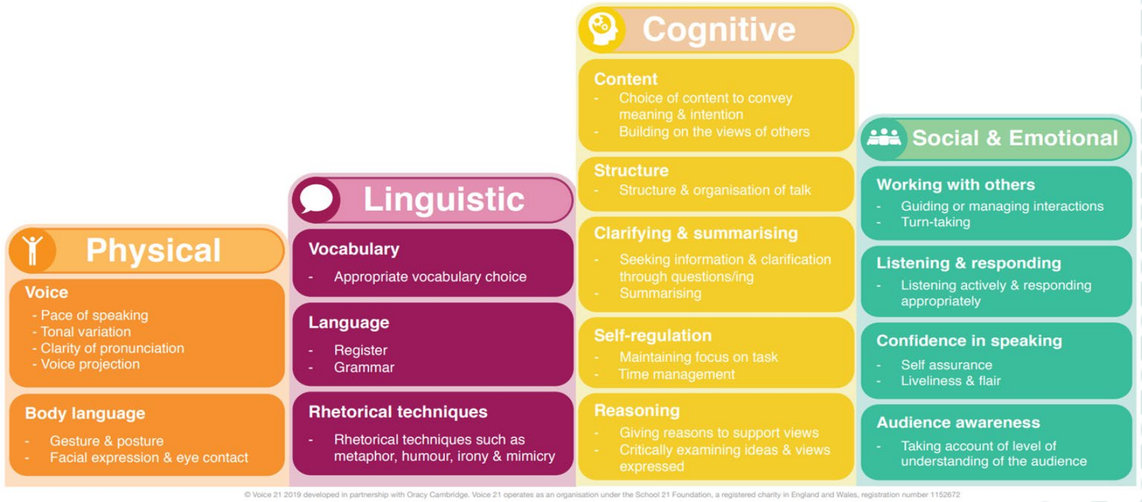
The Oracy Framework

The Oracy Framework was developed in conjunction with Voice 21 and Cambridge University as part of an EEF pilot project.
The idea is to use these strands and skills as a **teaching tool - a shared language** - to support teachers in teaching oracy skills explicitly.
The Oracy Framework can be used as a tool for setting expectations to think and speak mathematically.



Which skills from the Oracy Framework need to be taught and developed to build effective communication skills in maths?

Many of the skills involved to be able to reason effectively in maths require many of the skills from the linguistic and cognitive strands. When working with others to jointly construct knowledge, the social and emotional skills of oracy will play a prominent part (especially if we are considering how to encourage exploratory talk in maths).

Impact

Our oracy journey has allowed children to have the confidence and skills to **engage** in our curriculum.
In maths, this has led to a **jump in attainment** for all children, including those in receipt of Pupil Premium funding.

2019 end of KS2 maths data – 59% ARE
2022 end of KS2 maths data – 70% ARE
2023 end of KS2 maths data – 95% ARE
2024 end of KS2 maths data – 97 % ARE

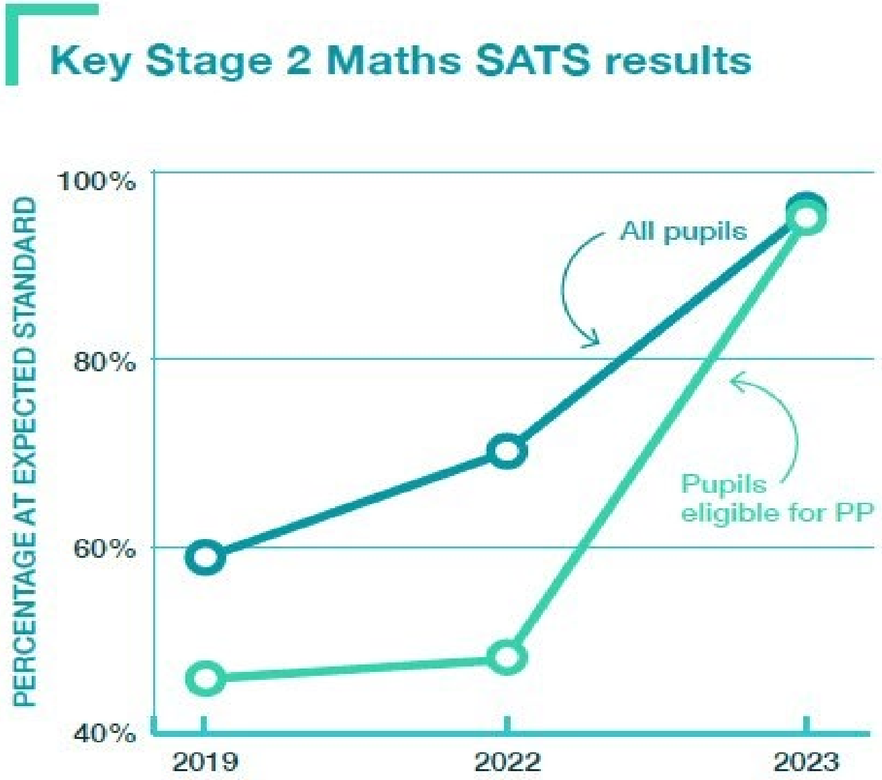
Children across the school are enabled to feel confident to develop their mathematical thinking in a safe and supportive environment, due to the focus on oracy in all classrooms.

Impact

Over time, children in receipt of Pupil Premium funding have been supported to make accelerated progress.

2019 PP maths – 46% ARE (-22% gap to non-PP), -5.94 progress
2022 PP maths – 48% ARE (-34% gap to non-PP), +0.7 progress
2023 PP maths – 94% ARE (-1% gap to non-PP), +4.5 progress

2024 – 65 % PP achieved GDS



“It makes me feel like the president because everyone’s listening to me!”

LEVI, YEAR 4 STUDENT

Before Levi started at Summerhill in Year 3, he'd never heard the word ‘oracy’ but now, one year in, he’s a vocal advocate for its importance both in school and beyond.

“I love using my oracy skills in class discussions. It makes me feel really important. We even use our oracy skills in reading and maths lessons. Sometimes we give presentations. I stood up in front of everyone in an assembly to present about air pollution. I didn’t feel nervous. I felt really confident!”

“Since Levi has started at Summerhill he is so much more confident at expressing his opinion both at home and at the clubs he attends outside of school” – Levi’s mum

Pupil voice now regularly tells us maths is one of the favoured subjects and children actively enjoy maths lessons.

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Making talk matter in maths

1. **Develop dialogue**
2. Value Vocabulary
3. Learn to listen

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1. Develop dialogue

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Mathematical talk is not something that can be expected of pupils occasionally or suddenly – it takes practice, and the expectation needs to be built up over time.

Create expectations of mathematical talk

- Expect full sentence answers to all questions. Expecting full answers even to short, closed questions, can develop some of the skills and confidence needed to respond orally to more complex mathematical problems

The expectation that students provide extended responses (though not necessarily complete or 'correct' ones) makes their processing and reasoning visible to the group, allowing for increasingly dialogic exchanges in which students probe different aspects of each other's ideas building new understanding along the way

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Develop dialogue - Shared expectations

Safe environment
Planning for discussion
Valuing every voice
Proof of listening
Expecting full sentence answers

Expecting a ‘because’ as part of every answer

Scaffold talk

Talk frames

Talk groupings with purpose

Vocabulary

Develop dialogue – planning for talk

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Re- structured maths lessons

Start with a talk prompt - retrieval practice / addressing misconception

What are they key concepts ? Plan the talk in – what do you want them to take away

If they can't talk the maths – unlikely they can transfer that to maths books

Talk it **first**

Place **high quality talk** at the centre of the learning over and above book evidence

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Develop dialogue – Safe environment

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- Every learner should feel like their voice matters . Establish discussion guidelines – these set expectations for talk- sets a powerful precedent
- Such a culture takes time – learners need to realise that an incorrect answer is acceptable as is sharing a partially formed idea
- Likewise it takes time to develop the resilience to be challenged - “ with respect” “ Respectfully I disagree”
- As the teacher you need to model mistakes and sharing undeveloped ideas
- Avoid praising correct ideas – note thought processes or oracy skills

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Develop dialogue – Safe environment

Opportunities to **talk about something other than 'the answer'** can create a more discursive atmosphere and reduce inhibitions by removing the anxiety of being 'wrong'

.For example – classifying, comparing, focusing on method rather than solution. Questions such as 'What do you notice?' or 'What's the same ? What's different ? can be useful.

18.09.2023

WALT: understand what makes 100

What's the same?

What's different ?

Vocabulary

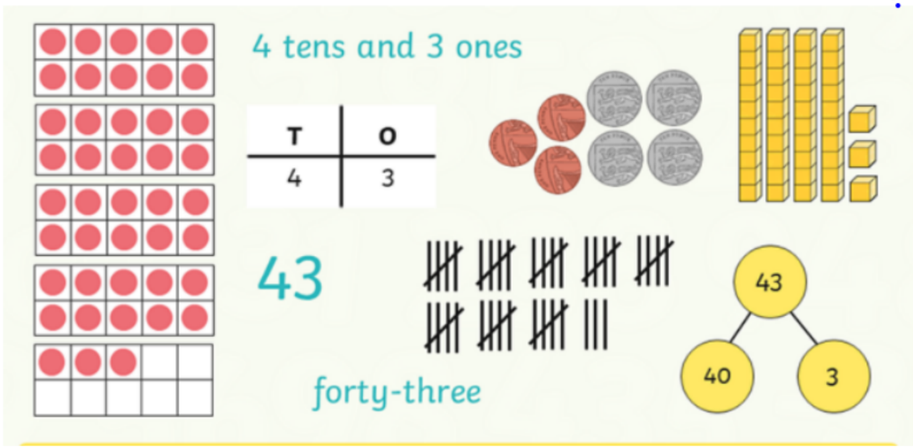
digit

tens

ones

hundred

Placeholder



Something that is the same ..... Something that is differen

Developing dialogue -Talking points

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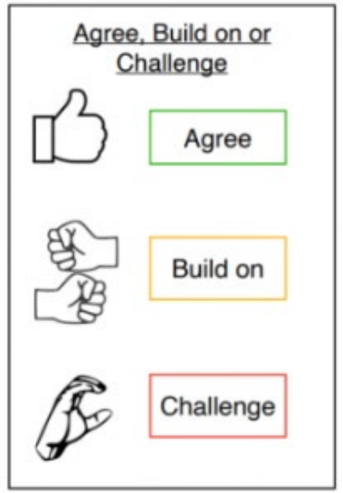
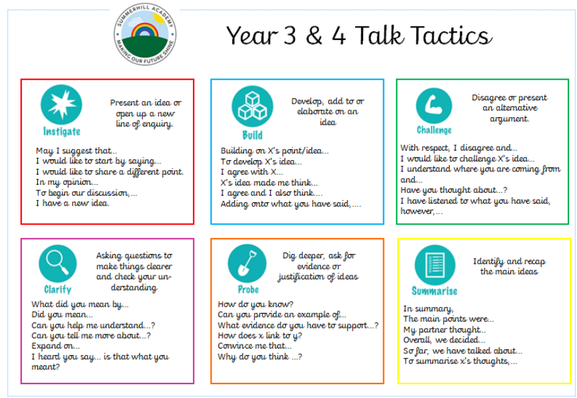
Controversial or thought provoking , possibly factually incorrect statements related to topic that promotes discussion
Working towards a consensus – remains focused and purposeful

1/2 of 45 is the same as 1/4 of 90.





Talk frames

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Developing dialogue -Talking points

Expectations

respect everyone's opinion
Listen to everyone
Support your idea with evidence

your turn to talk

The numerator should always be smaller than the denominator

This could be adapted to an always , sometimes , never question - promotes reasoning , evidencing answers with examples – check for understanding

Developing Dialogue -Which one does not belong ?

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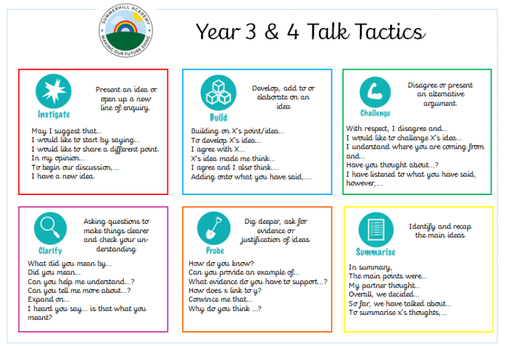
WALT: recognise right angles

One of these shapes is different to the others:

The odd one out is ... because...
I think the odd one out is ....



Important any of them could be the odd one out
Generates discussion
Listen , propose and reach consensus

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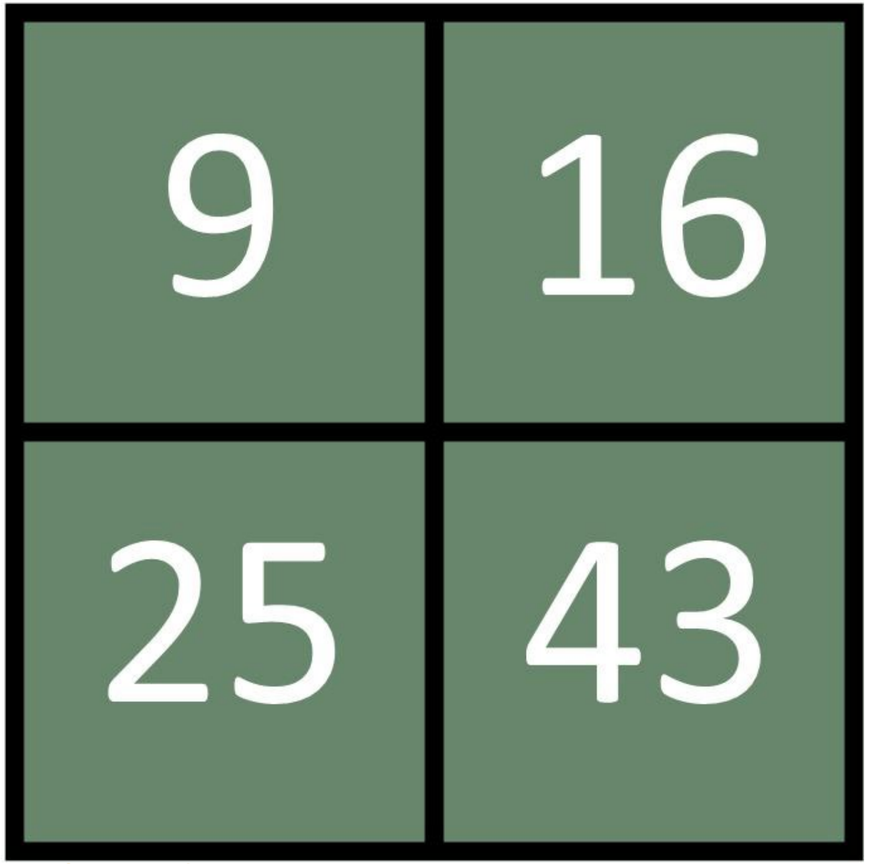
Developing dialogue - which one does not belong ?



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your turn to talk

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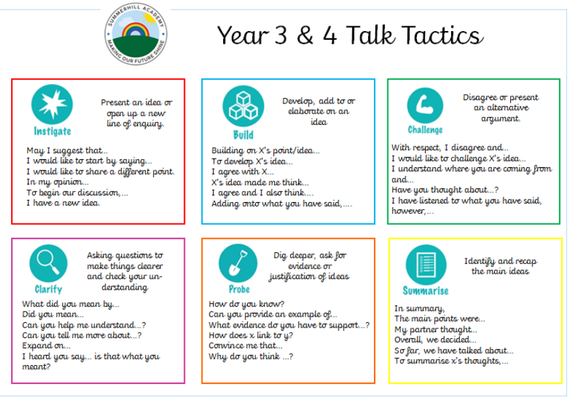
https://talkingmathwithkids.com/wodb/



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Developing Dialogue – transforming partner talk

Paired talk is the place to start when embedding talk but **each** stage is as important as the other and must be valued. Invest in the time to build the habit

Normalise physically **turning** to talk to your partner , maintain eye contact and take turns and listen

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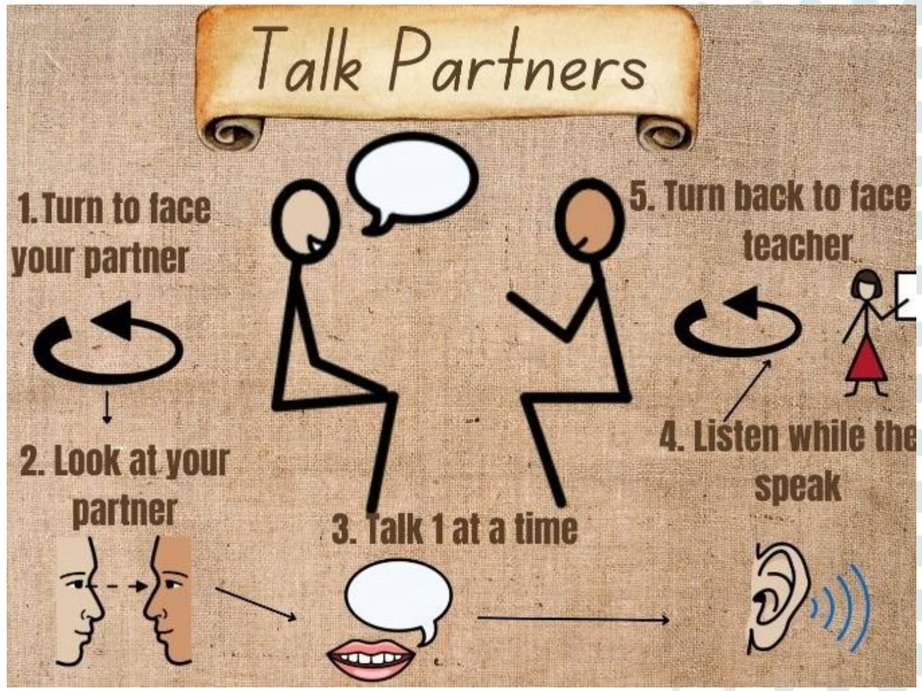
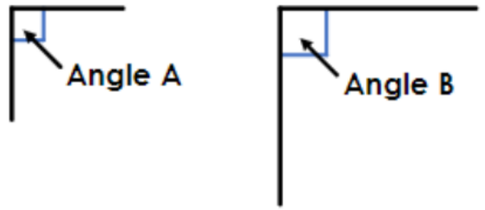


Developing Dialogue – transforming partner talk

14.01.25

WALT - investigate the shapes made when cutting rectangles on the diagonal

Explain the Mistake



Angle A is a smaller right angle than angle B

Vocabulary

right angle
same size
quarter turn
length
turn
diagonal

The mistake is ....

I know ... so I know ....

Planned for , considered talk opportunities - adding value / formative assessment

Anticipate responses – what are they going to say / see

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Developing Dialogue – transforming partner talk

Value thinking time – don't fear it – let them think - Encourage if appropriate mini whiteboards to record thoughts

Whilst paired circulate - identify misconceptions / ideas you want to hear - pre warn - " can you share that ?"

During share ensure a range of voices

Purposefully sequencing the student responses while allowing dialogue

Developing dialogue – Talk groupings and talk roles

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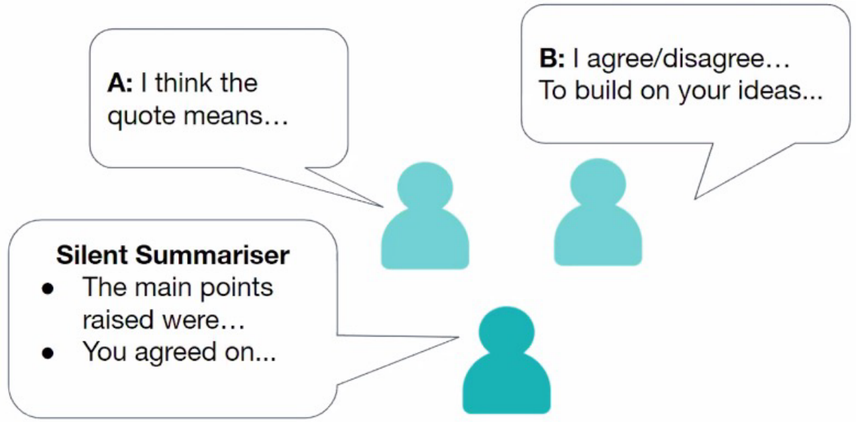
What size grouping works for this activity ?
What composition works ?
Tempting to mix dominant with quieter but does that always work ?

Silent Summarizer – Works well for your louder , more dominant learners – must remain silent and listen – also works for those quieter learners – gives them time to listen and consider not immediately having to contribute

Questioner - works to scaffold / peer support- stretches everyone



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Developing dialogue – Elevate the quality of talk

WALT- represent counting in twos as the 2 times table

	×2
0	0
1	2
2	4
3	6
4	8
5	10
6	12
7	14
8	16
9	18
10	20
11	22
12	24

What do you notice about this table?
What patterns can you see ?

I notice ....
A pattern I can see is ....

Vocabulary
equal
groups
product
factors
multiple

WALT- represent counting in fours as the 4 times table

_ x _ = _

Factor x Factor = Product

How many shoes are there ? Use your two times tables to **prove** this.

There are _____ groups of two shoes.
There are ____ shoes altogether
The product of ___ and ____ is ____

Sentence stems vs Stem sentences

Choral repetition of whole sentence answers can help pupils to engage better with more independent mathematical talk, by modelling and giving them the tools they need to begin to construct their own sentences.

Developing dialogue – Elevate the quality of talk

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2. Value vocabulary

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In order to, effectively develop mathematical talk, pupils will need to acquire mathematical vocabulary. You must be a strong advocates of using technical and precise mathematical language and introduce this very explicitly to pupils, carefully planning its introduction and use

National Centre
for Excellence in the
Teaching of Mathematics

Mathematics glossary
for teachers in
Key Stages 1 to 3

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2. Value vocabulary

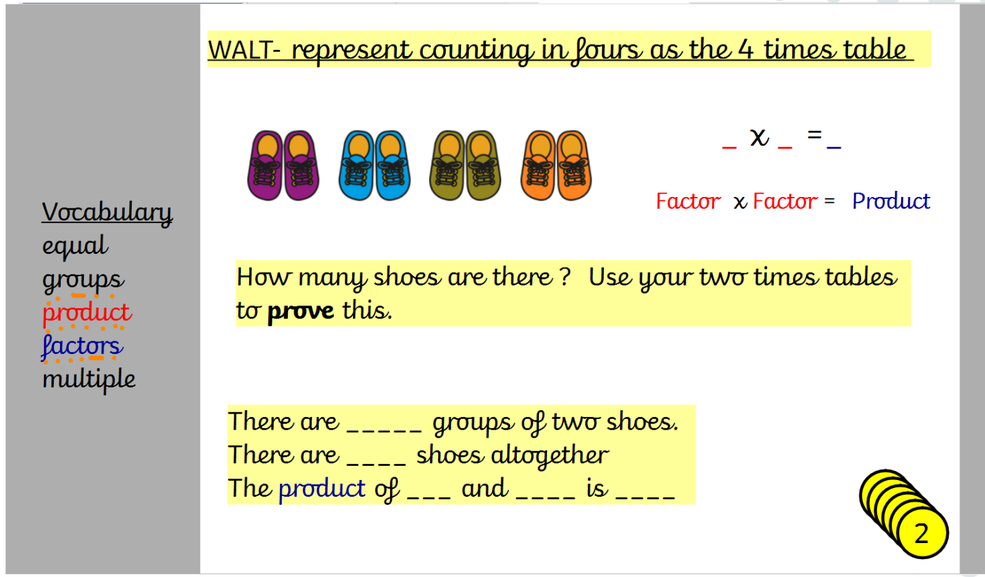
Rather than expecting new words to leap from understanding to being used in written work – oracy creates a space to try out , revise and demonstrate understanding

Sentence stems and stem sentences – also powerful for reinforcing specific target vocabulary

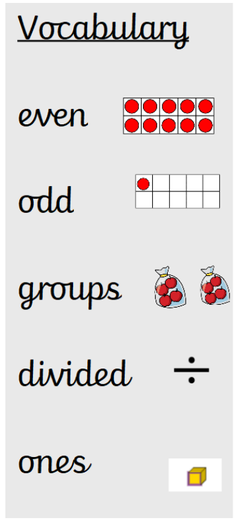
Talking points – including new vocabulary

“All 3D shapes have vertices”– must grapple with

Physical – my turn your turn , chanting new vocabulary together

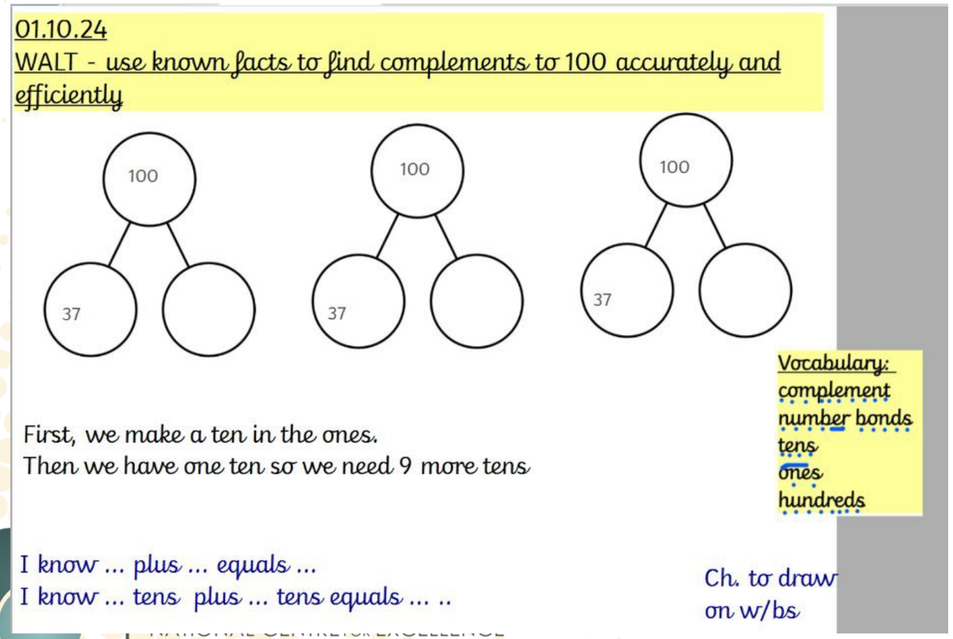


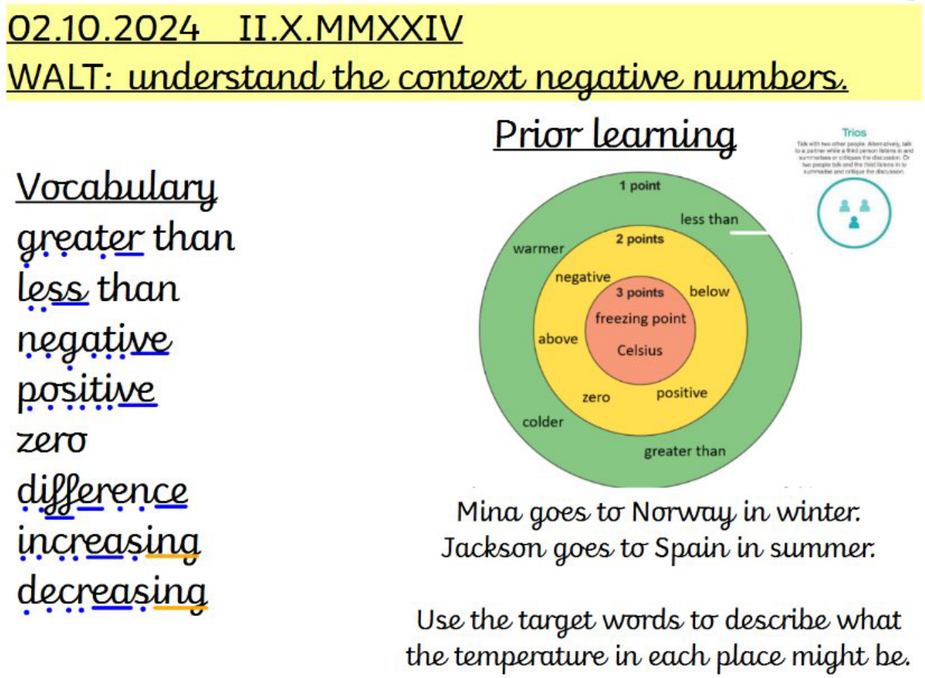
2. Value vocabulary



Scaffold the thinking – show them the vocabulary
Lower the cognitive load

Summary bullseye – consolidates taught vocabulary
Useful tool for maintaining vocabulary and ensuring accurate Mathematical vocabulary.





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3. Learn to listen

Start with the physical – explicitly teach this -

The most important person in the room is the person who is speaking

Maintain eye contact

Remain calm and still

Face the speaker

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3. Learning to listen

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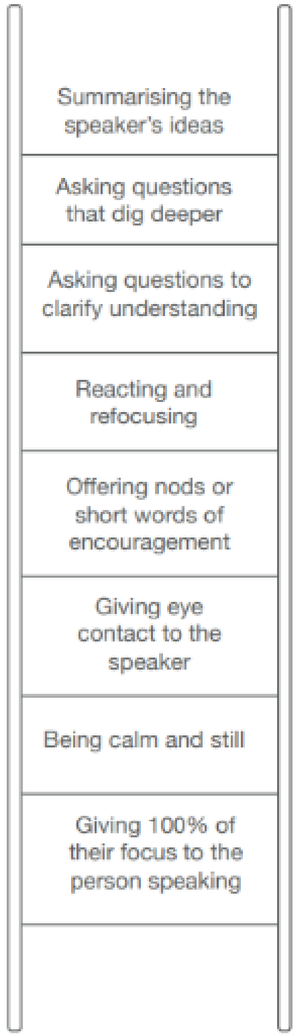
Listening Ladder

The Listening Ladder sets out the various listening skills and orders them in terms of complexity. It can be used to support students to reflect on their discussion and to set targets for which rung the have and want to reach.



Base expectation on ladder

Skills progression

Set targets where they will go next time

> During our visit, we noticed how carefully students at Summerhill listen to each other during discussions. In one lesson a Year 4 student interjected during whole-class talk asking if she could return to what her classmate had said a few minutes ago to ask them to clarify something they had said.

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So how do I get my children talking in maths lessons ?

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Talking in maths might feel unnatural if children haven't done it before . It doesn't happen overnight and takes work but it will bring your maths lessons to life

- Create a safe space - mistakes are ok – we learn from mistakes – lots of voices

- Model the talk and remodel the talk
- Plan for the talk
- Listen to their answers – value **everyone's** answer - This creates the culture but also is some of the most **powerful** formative assessment
- Don't be afraid of the noise - if you get the culture right it will be magic

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You have to be an **advocate** for oracy.

A generic approach to oracy would be bad. We don’t need a diktat that every lesson must include a debate or a speech. But a disciplinary approach, one that recognises the crucial role of speaking and listening in maths, could pay dividends.’

- DAVID THOMAS, AXIOM MATHS25

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Reflections

What are you thinking about? What has stayed with you?
What does this mean for your practice? What is the first thing you are going to do?

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