PRODUCTIVE DISPOSITION
AND ITS CENTRALITY
IN A MASTERY CURRICULUM

• Ones, tens, hundreds
• Ones, twos
• Fives, tens,
• Twos, fives

Computation
Memory
Back to basics

Structure
Reasoning
Problem solving

Computation
Memory
Back to basics

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Most maths problems have only one way to solve them.

Maths is a creative subject.

Getting answers correct is more important than understanding why the answer is right.

And an extra

Most strongly agree

Most strongly disagree

Students should be able to figure out for themselves whether answers are correct.

Knowing how to perform a procedure is more important than understanding why it works.

Students can discover maths without it being shown to them.

There’s some school maths which isn’t at all useful.

Maths is so important everyone should learn it.
PRODUCTIVE DISPOSITION

is the inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy.

VALUE

What does it mean to ‘value’ maths?
Does all maths have to be ‘useful’?

What elements of a classroom climate would encourage viewing maths as valuable?

PRODUCTIVE DISPOSITION

is the inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy.

Value what they are asked to do
Understand the structure – it’s not magic
Authority lies in the subject not with the teacher – it has its own coherence.
Appreciating the appearance of maths everywhere but understanding specific cases
Teacher models an appreciation of it as a subject to engage with voluntarily

Foucault: “People know what they do; frequently they know why they do it; but what they don’t know is what they do does.”
BELIEF
Some learners believe they will be successful. What behaviours do they exhibit? How can we help students to believe they can be successful at maths?

Students show resilience – positive response to negative situations – don’t give up. Expect to be able to do it. 
Believe they can change what they are able to do through applying themselves, rather than that abilities are fixed and can’t change (growth v fixed mind set) 
Praise the behaviour not the ‘ability’ 
‘Yet…’
‘Ability’ grouping – research shows don’t get the same curriculum offer 
Wait time appropriate
Teachers believe in their own ability to ensure students’ success

EFFORT
Some learners just keep trying whilst others give up easily.
What can we do to increase the motivation of our pupils?

Engaging tasks
Low threshold high ceiling
True collaborative opportunities (group goals, individual accountability)
Own progress rather than competitive
Mistakes as learning tools
Ideas and methods valued
Autonomy in choice of methods
Active engagement rather than contrived ‘fun’
Emphasise intrinsic motivation – rewards/punishment can distract and undermine learning goals

Results indicated that students were more likely to hold productive dispositions (autonomy, belief that mathematical competence is malleable rather than fixed, focus on understanding over task completion) in a classroom in which the teacher transferred responsibility to students, solicited multiple solution strategies, provided process scaffolding, and pressed for conceptual understanding.

In contrast, students were less likely to hold productive dispositions (relying on external authorities, belief that mathematical competence is fixed rather than malleable, focus on task completion over understanding) in a classroom in which the teacher provided content help that lowered the cognitive demand for students, focused on obtaining an answer rather than understanding strategies, and placed “genius” in each small group (explicitly grouped students heterogeneously). Jensen
CHILDREN'S OWN VOICES

Borthwick, A. 2011 Children's perceptions of, and attitudes towards, their mathematics lessons BSRLM

Children asked to draw picture of their mathematics lessons, categorised according to content;
Children's emotions and attitudes
Children's perceptions of their peers in mathematics lessons
Children's perceptions of their teacher in mathematics lessons
Mathematics in the drawings

QUESTIONS TO ASK

“How would you describe maths to someone?”
“What does a Mathematician do?”
“What do you need to be successful at maths?”

Nuo asiat opit ilman iloa unohdat helposti
Those things you learn without joy you forget easily.
Thank you