Developing Mathematical Resilience KS2 Workshops

3 July 2018
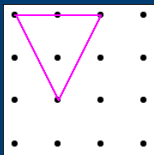
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What do we mean by mathematical resilience?

Why would we like learners to develop mathematical resilience?

How can we help learners become more resilient in mathematics?

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Inside Triangles (5648)

How many triangles with one dot in the middle can you draw on a four by four dotty grid?

How do you know you have found them all?

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Key problem-solving skills

Trial and improvement

Working systematically

Pattern spotting

Working backwards

Reasoning logically

Visualising

Conjecturing

Generalising

Proving

See article 'Using NRICH Tasks to Develop Key Problem-solving Skills' (11082)

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How did you feel as you worked on Inside Triangles?

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Mathematical fallacies

• Learning mathematics is easy if you have the right aptitude; if you don't and therefore make mistakes and get stuck, you can't learn mathematics

• Mathematics is something that you have to work on by yourself and that you keep quiet if you can't keep up

• There is an elite few who can do mathematics

See 'Growing the Mathematical Growth Zone' by Clare Lee and Sue Johnston-Wilder (13491)

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Slide 1

'one of the characteristics of the mathematically resilient learner is that they have the language both to express any feelings about being out of control and to request the support they need…'

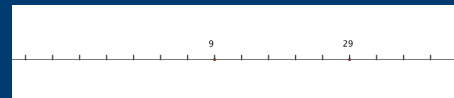*See 'Getting into and staying in the Growth Zone' by Clare Lee and Sue Johnston-Wilder (13491)*

Slide 2

Number Lines in Disguise (13452)

What do you notice about this number line?

What questions could you ask?

9   29

Slide 3

What strategies did you use to figure out the missing numbers?

How did you show resilience if you got stuck?

Slide 4

The Growth Zone Model

Comfort
Growth
Anxiety

See 'Getting into and staying in the Growth Zone' by Clare Lee and Sue Johnston-Wilder (13491)

Slide 5

Possible Pieces (13832)

Some of the most common jigsaw shapes are a bit like these three pieces:

So, for each jigsaw piece we start with a square template, then some sides have a peg. The edge pieces of the jigsaw have one or two straight sides.

Slide 6

Challenge 1

Using pieces that have at least one peg and one hole, find **all the possible ways** of making a rectangular jigsaw three pieces wide and two pieces deep, with straight edges all the way around. All six pieces must be different.

Challenge 2

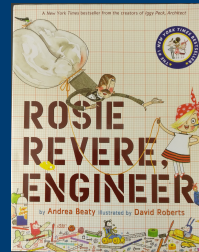Find all the possible pieces that have at least one peg and one hole.

Learning through reflection

Working together

a) Understand the problem together
b) Decide and demonstrate how to work as a pair/group
c) Articulate how it was decided to move from one challenge to the next
d) Communicate with each other to agree on/explain their recording strategy/ies
e) Build on the discussion to develop ideas and strategies they are trying out
f) Each team member has been observed sharing their thinking with the team and explaining clearly
g) Are observed stopping to listen to others' explanations
h) Clarify each other's thinking
i) Challenge thinking shared by another team member
j) Develop their own/or the pair's/group's thinking
k) Convince others of their reasoning
l) Draw together the pair's/group's working into a joint solution

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Rosie Revere by Andrea Beaty

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Resilience and Perseverance Feature (13554)

Includes:

- Article 'Getting into and staying in the Growth Zone' (13491)
- A range of primary tasks designed to promote a positive attitude to challenging mathematical situations

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