

Settling task

Write down the strategies you currently use to motivate pupils in maths.



Developing pupils' intrinsic motivation



Seminar norms

Throughout the seminar please:

- keep your camera on
- mic muted if not talking
- 'raise your hand' if you wish to speak



Introductions

Seminar objectives

By the end of this seminar you will:

- know what impacts upon pupils' motivation
- know how to use small steps to help all pupils to achieve meaningful success
- know how to plan effective explanations and tasks and help all pupils achieve meaningful success
- reflect on your practice and identify areas to develop to support all pupils to achieve meaningful success

ECF statements



High expectations (Standard 1 – Set high expectations)

1.1 Teachers have the ability to affect and improve the wellbeing, motivation and behaviour of their pupils.

Adaptive teaching (Standard 5 – Adapt teaching)

Provide an opportunity for all pupils to experience success, by:

- *Balancing input of new content so that pupils master important concepts.*

Managing behaviour (Standard 7 – Manage behaviour effectively)

7.4 Teachers can influence pupils' resilience and beliefs about their ability to succeed, by ensuring all pupils have the opportunity to experience meaningful success.

7.6 Pupils are motivated by intrinsic factors (related to their identity and values) and extrinsic factors (related to reward).

7.7 Pupils' investment in learning is also driven by their prior experiences and perceptions of success and failure.

Motivate pupils, by:

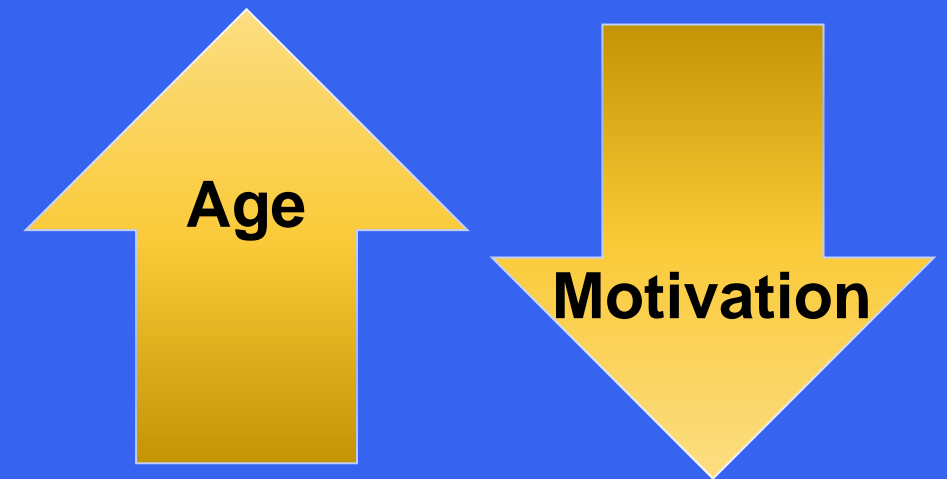
- *Helping pupils to journey from needing extrinsic motivation to being motivated to work intrinsically.*



Why is motivation important?

Motivation impacts academic achievement.

Motivated pupils learn more, persist for longer and produce high-quality work.



(Lazowski & Hulleman, 2016)

Extrinsic and intrinsic motivation

Intrinsic motivation – identity and values

Extrinsic motivation – rewards



Reflection:

Which strategies did you identify in the settling task?

Do they align with developing intrinsic or extrinsic motivation?

Developing motivation

What's the challenge?

Learning is effortful, and the brain doesn't enjoy challenging thinking.

Motivation is incredibly complex and invisible.

Self-Determination Theory

Autonomy – sense of choice

Competence – perceptions of success or failure

Relatedness – feeling connected to and supported by others

Reflect: Think of a time when you started doing a task but gave up. Can you attribute your reason for giving up to one of these components?

Developing a sense of competency

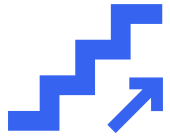


Competence – how likely am I to be **successful** at this task?

ECF statement

7.7 Pupils' investment in learning is driven by pupils' prior experiences and perceptions of *success* and *failure*.

Securing success



Teaching in small steps



Plan purposeful explanations and tasks



Teaching in small steps

Circle the statement that you think matches the picture.



There are 3 groups of 5

There are 5 groups of 3



Consider:

What error might pupils make when completing the question on the slide?

Why might that happen?

Break concepts into small teaching points

Outcome: Multiply by grouping	
Teaching point 1	Objects can be grouped into equal or unequal groups.
Teaching point 2	When describing equally grouped objects, the number of groups and the size of the groups must both be defined.
Teaching point 3	Equal groups can be represented with a repeated addition expression.
Teaching point 4	Equal groups can be represented with a multiplication expression.
Teaching point 5	Multiplication expressions can be written for cases where the groups each contain zero items, and for cases where the groups each contain one item.



Consider:

What do you notice about these teaching points?

Why is it important to identify teaching points when teaching about a concept?

Break teaching points down into small steps



Teaching point 1: Objects can be grouped into equal or unequal groups.

Task 1:
“There are some pencils.”

“The pencils have been grouped.”

Task 2:

Max has some apples. The apples have been grouped. The groups are equal because there are the same number of apples in each group.

Task 3:

Lucia has some apples. The apples have been grouped. The groups are unequal because there are a different number of apples in each group.

	Equal groups	Unequal groups

Breakout activity



Teaching point 2: When describing equally grouped objects, the number of groups and the size of the groups must both be defined.

Discuss:

- What are pupils learning in each task?
- What order would you introduce these?
- How does each task build on the last?

B

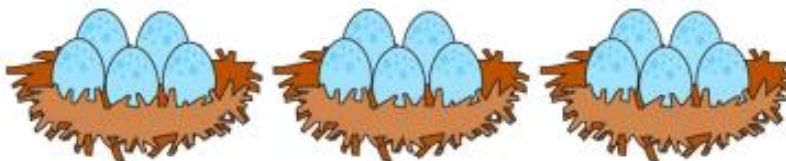
True or false?

There are 5 groups of 2.



A

'Complete the sentences.'

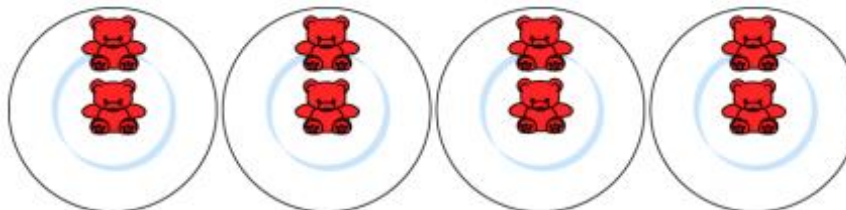


- There are ___ equal groups of eggs.
- There are ___ eggs in each group.
- There are ___ groups of ___.

D

'How many equal groups are there?'

'How many bears are there in each group?'

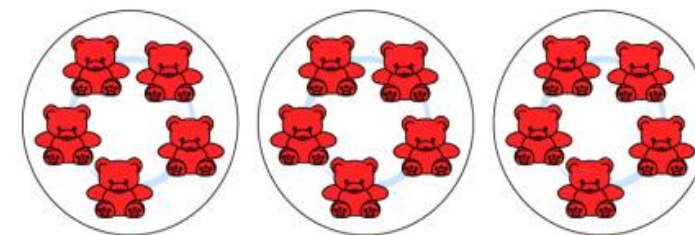


- *'There are four equal groups of bears.'*
- *'There are two bears in each group.'*
- *'There are four groups of two.'*

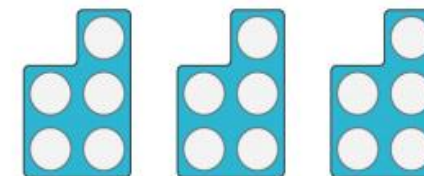
C

'Look at the representations below.'

- *'What's the same?'*
- *'What's different?'*



5	5	5
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Reflection



Think about the most recent concept you taught:

- Were all pupils successful in understanding this concept?
- How did you break the teaching point into small steps to enable all pupils to succeed?
- How could you have improved this further?



What do you notice about this activity?





Consider:

What do you notice about this activity?

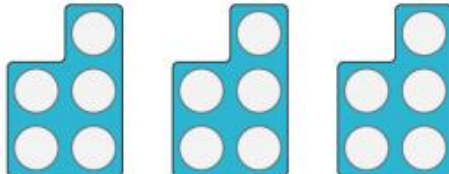
Why have these four questions been chosen?

• 'Look at the representations below.'

- 'What's the same?'
- 'What's different?'



5	5	5
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Plan purposeful explanations and tasks

- Present concepts using multiple examples and non-examples to show what the concept is and what it is not.
- What will change and what will stay the same?

Avoid mechanical repetition!

T

Help pupils overcome:

- limited understanding of mathematical concepts
- limited ability to identify the mathematics when its context is slightly changed
- limited ability to know how to approach mathematical problems with a slight variation to what they are familiar with
- inflexible and unconnected understanding

Select calculations purposefully

Find the difference:

$$10 - 5 =$$

$$9 - 4 =$$

$$19 - 14 =$$

$$18 - 13 =$$

$$8 - 3 =$$

Consider:

- What do you notice about the answers and why do you think the teacher has ensured that happens?
- Why has the teacher put them in this order do you think?
- How might this help to develop intrinsic motivation?

Select calculations purposefully



$$10 - 5 = 5$$

Start off with a calculation that is accessible to all.

$$9 - 4 = 5$$

The minuend and subtrahend in the previous question have both decreased by 1 and the difference has stayed the same.

$$19 - 14 = 5$$

The minuend and subtrahend in the previous question increase by the same amount (10) and the difference stays the same.

$$18 - 13 = 5$$

The minuend and subtrahend from the previous question have both decreased by 1 and the difference has stayed the same.

$$8 - 3 = 5$$

The minuend and subtrahend from the previous question have been decreased by the same amount (10) and the difference stayed the same.

Breakout activity

A Tick the shapes that are rectangles:

B Which pencil is longer?

C Shade the picture to match the fraction:

$\frac{2}{3}$ $\frac{1}{4}$ $\frac{4}{9}$ $\frac{2}{3}$

D Use fractions to express the coloured parts:

() () () () () () () ()



Discuss:

- Which part of each task helps pupils to avoid mechanical thinking and deepens their understanding?
- Which misconceptions does this help to address?
- How can this support pupils to be successful?

Reflection

Think about the most recent concept you taught:

- Were all pupils successful in understanding this concept?
- How did you purposefully select examples and questions to develop understanding and help pupils avoid mechanical thinking?
- How could you have improved this further?



Networks and resources

- NCETM
- Whiterose maths
- The Primary Collective





Thank you.

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