

Mastery for Maths at IVJS

Coffee Afternoon
Friday 2nd February 2018

Mr Clifford & Miss Zughaid

Objectives

- Understand what is mastery for maths
- Understand bar modelling
- Understand STEM sentences and ping ponging
- Share good practice
- Mastery for Maths at IVJS

What does it mean to master something?

- I know how to do it
- It becomes automatic and I don't need to think about it- for example driving a car
- I'm really good at doing it – painting a room, or a picture
- I can show someone else how to do it.

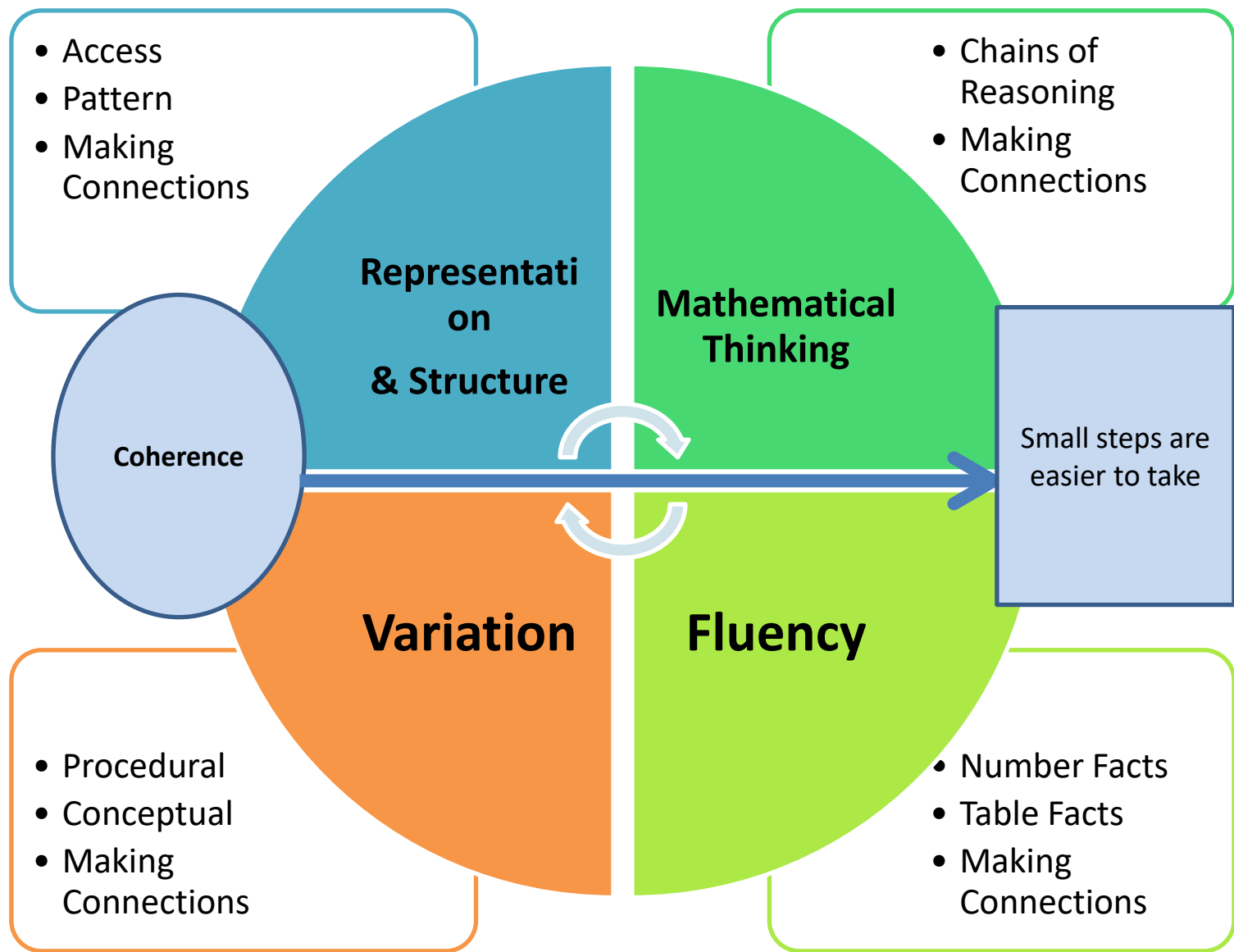
Mastery of Mathematics is more.....

- Achievable for all
- **Deep** and sustained learning
- The ability to build on something that has already been sufficiently mastered
- The ability to reason about a concept and make connections
- Conceptual and procedural fluency

Teaching for Mastery

- The belief that all pupils can achieve
- Keeping the class working together so that all can access and master mathematics
- Development **of deep** mathematical understanding
- Development of both factual/procedural and conceptual fluency
- Longer time on key topics, providing time to go deeper and embed learning

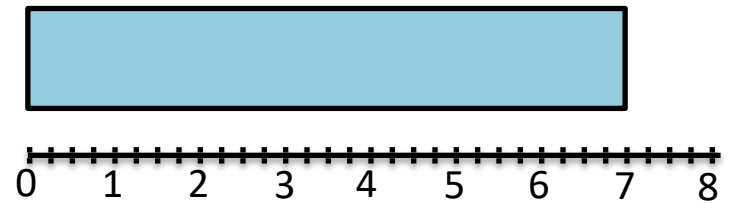
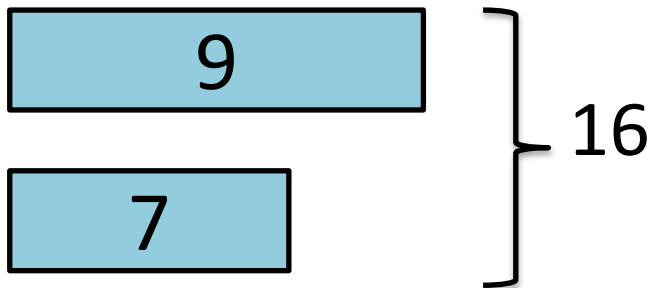
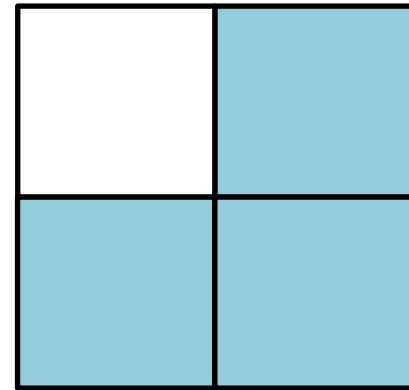
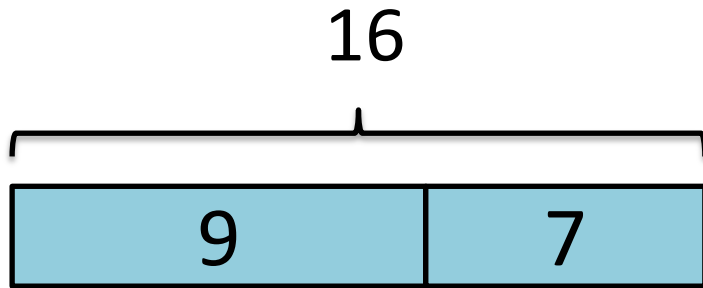
Teaching for Mastery



REPRESENTATION AND STRUCTURE

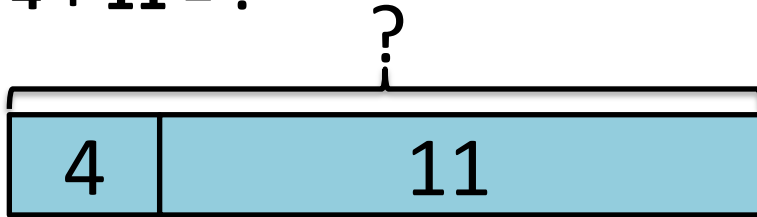
Mathematics is an abstract subject,
representations have the potential to provide
access and develop understanding.

What Are Bar Models?

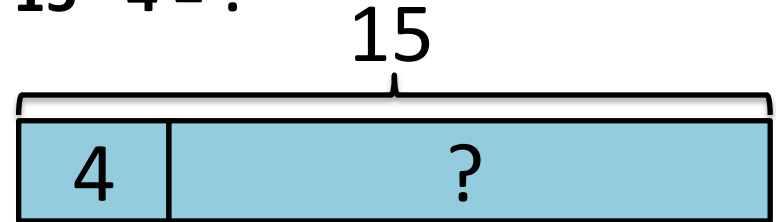


A Consistent Picture

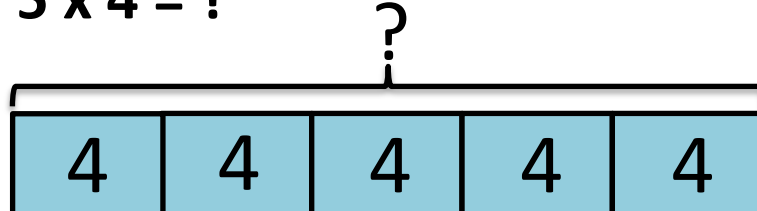
$$4 + 11 = ?$$



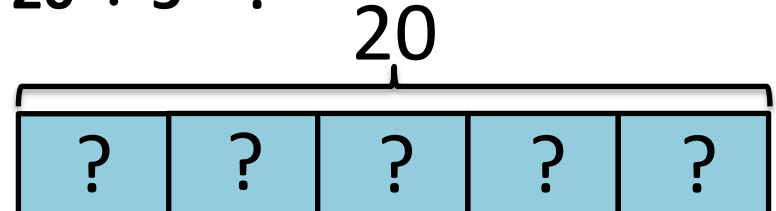
$$15 - 4 = ?$$



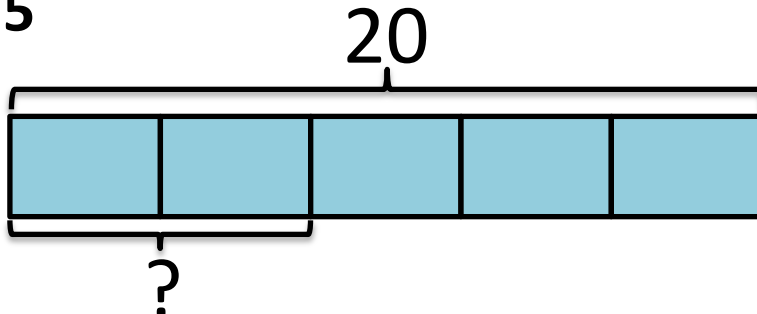
$$5 \times 4 = ?$$



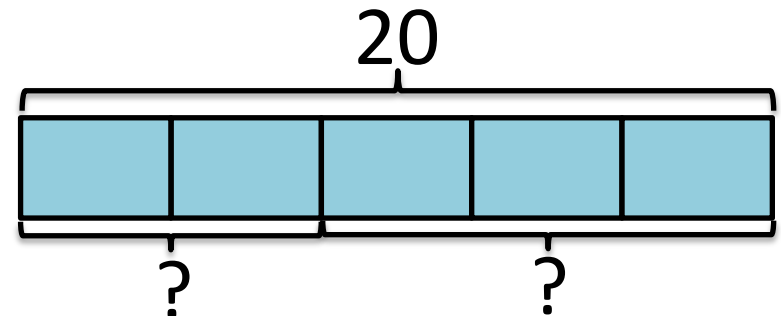
$$20 \div 5 = ?$$



$$\frac{2}{5} \text{ of } 20 = ?$$



Share 20 in the ratio 2:3



KS2 barmodelling

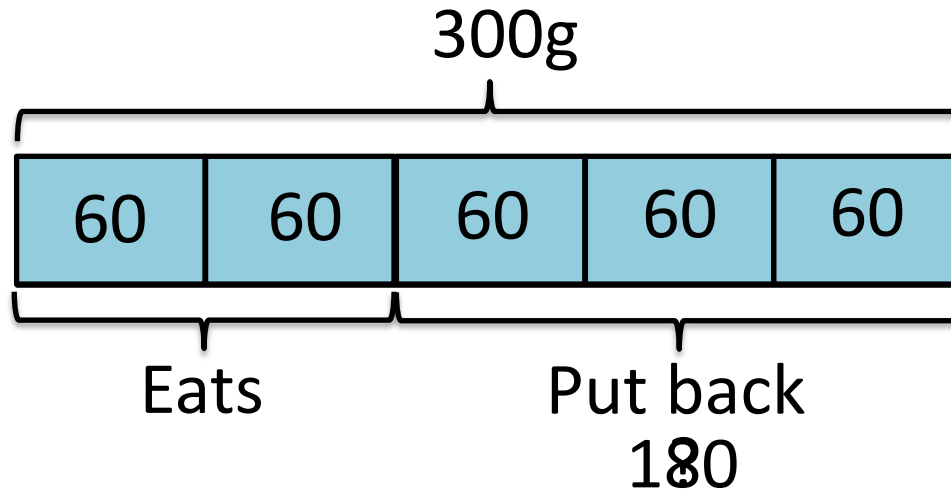
$$\frac{3}{5} \text{ of } 20 = ?$$

KS2 Bar Modelling

Solve... Matthew has a 300g block of cheese. He eats $\frac{2}{5}$ of the cheese and puts the rest back in the fridge.

How much cheese did Matthew put back in the fridge?

Model

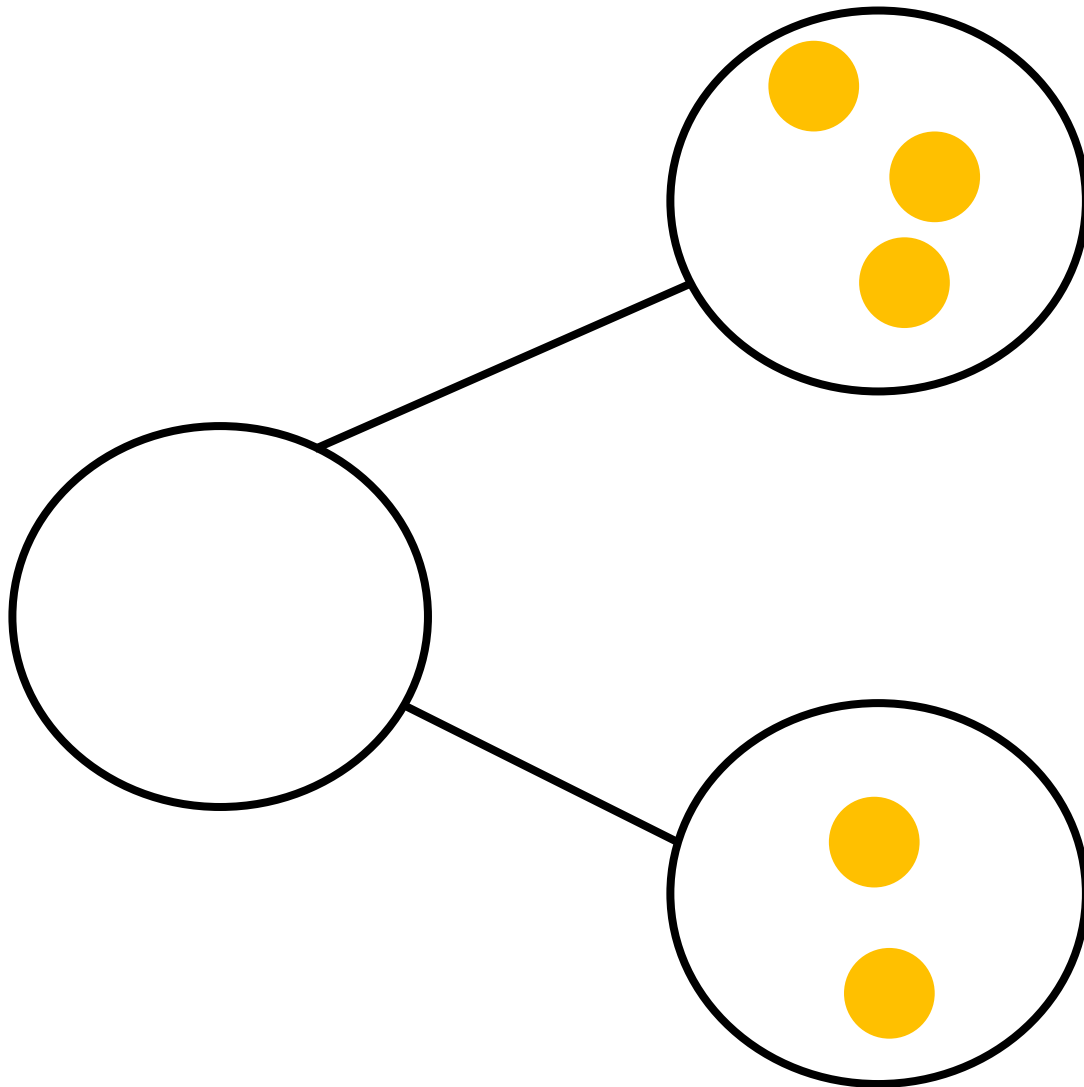


Calculations

$$300 \div 5 = 60$$

$$3 \times 60 = 180$$

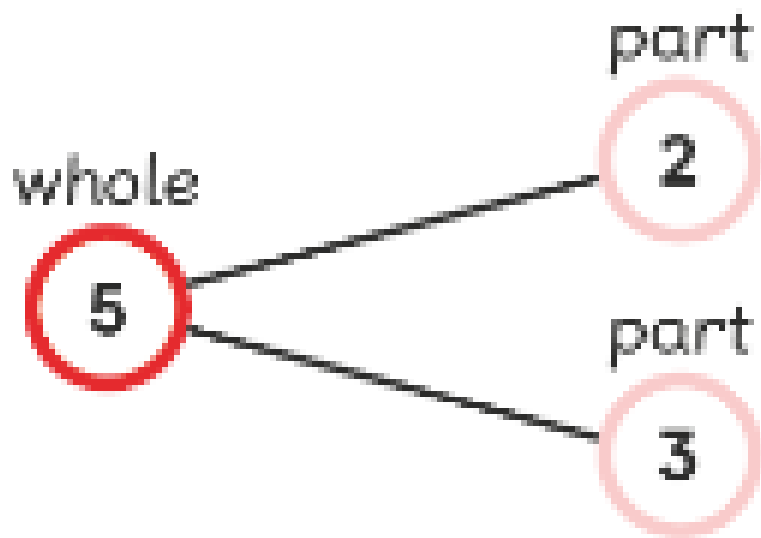
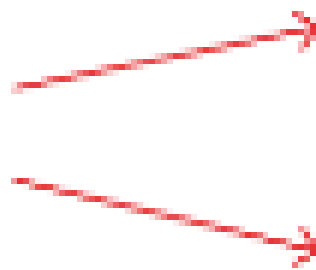
Part-Part-Whole Models



Why did we do that
with concrete
resources?

How many other ways
could you plant your
seeds?

Put 5 cupcakes on two plates.



2 and 3
make 5.

This is a number bond.

Seeing structures in different ways Conceptual variation:

How could you describe what you see?

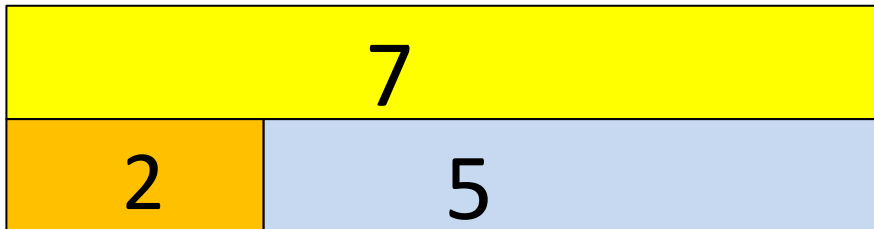
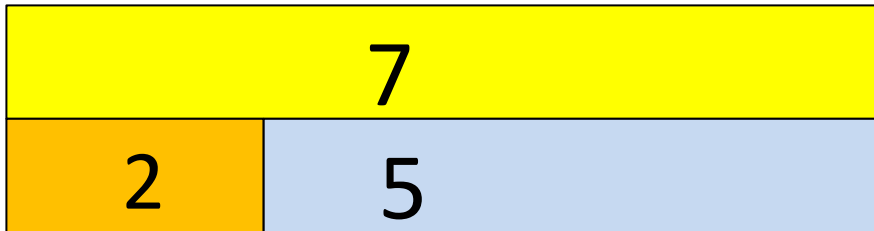
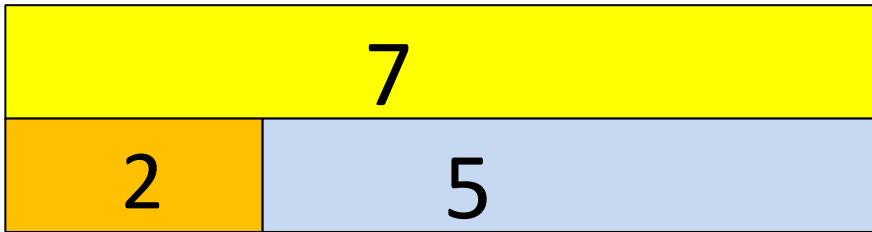
___ is the whole

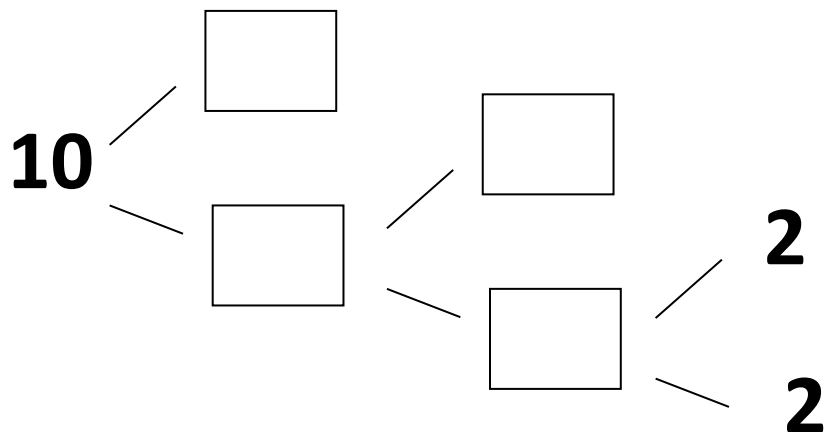
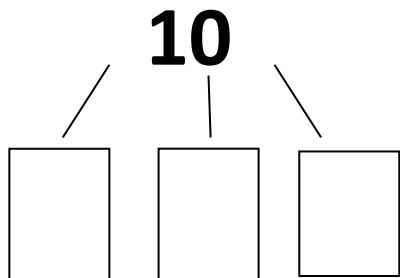
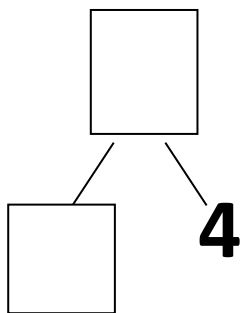
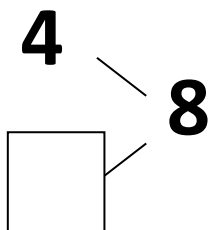
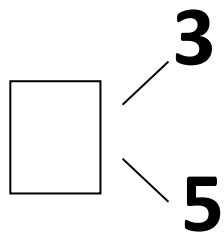
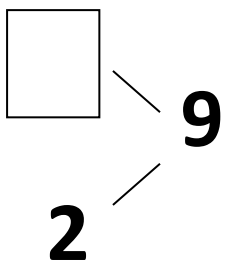
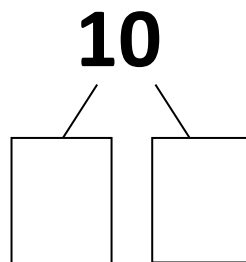
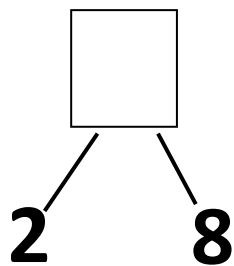
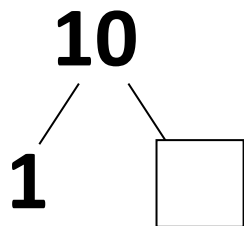
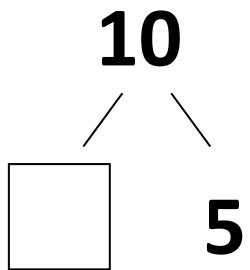
___ is a part and ___ is a part

___ and ___ makes ___

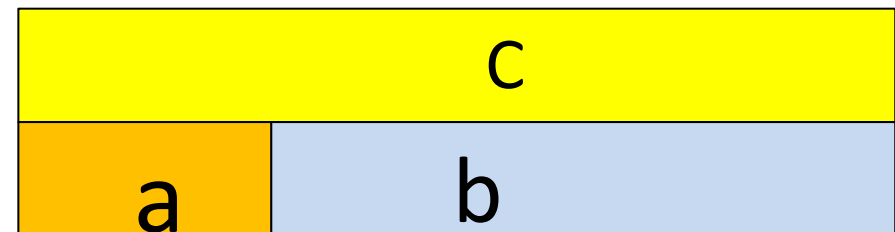
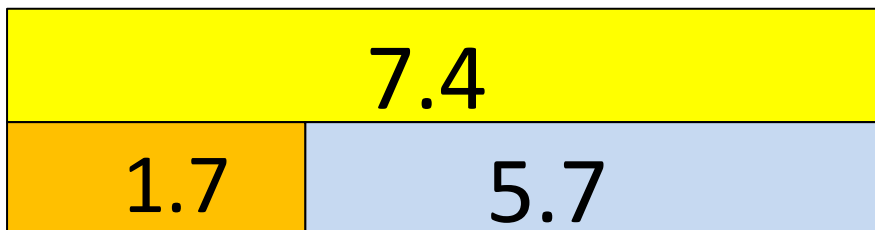
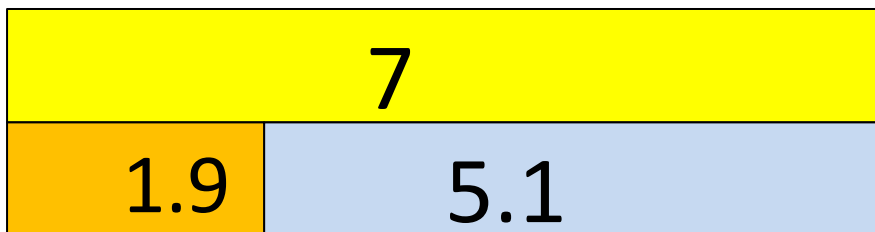
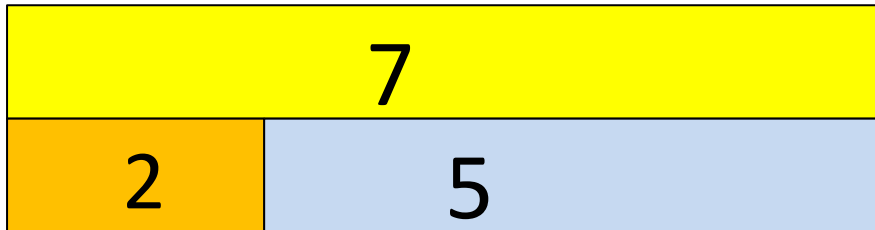


Developing depth/simplicity/clarity





Developing depth/simplicity/clarity



Ping Pong

- Provides a clear and coherent journey
- through the mathematics
- Provides detail and rigour
- Provides scaffolding for all to achieve
- Provides the small steps
- Provides the opportunity to question
- and think more deeply

Examples of STEM sentences

- Part + Part = whole
- Whole – part = part
- _____ is the perimeter because ____ + _____ + _____ + _____ is the distance around the shape

Variation Theory in Practice

Which set is easiest and why?

Set A

120 – 90

235 – 180

502 – 397

122 – 92

119 – 89

237 – 182

Set B

120 – 90

122 – 92

119 – 89

235 – 180

237 – 182

502 – 397

Taken (and slightly modified) from Mike Askew, Transforming Primary Mathematics, Chapter 6

Mastery for Maths at IVJS

- Provide children with visual representation in the form of a bar model/cherry tree diagram and use the language: whole and part
- Ping Pong STEM sentences – include these in your success criteria
- Don't accept one word answers
- 'Design' your starters to help build concepts

“Pupil progress shouldn’t be confused with curriculum pace: good progress in mathematics is not about moving on quickly”

Vanessa Pittard , May 2017