

# What do we mean by Mastery?

- **Deep** and sustainable learning – **for all**

Depth is the key to avoiding the need to repeat teaching.

It doesn't feel like we're starting again each term.

- The ability to build on something that has already been sufficiently mastered

...for this stage of learning - Mastery is a continuum

# What do we mean by Mastery?

- **The ability to reason about a concept and make connections**
  - Cuts down on the amount I need to learn  
eg relating concepts of division, fractions and ratio
  - Deepens conceptual understanding.
- **Conceptual and procedural fluency**
  - Move maths from one context to another. Recognise concepts in unfamiliar situations.
  - Know number facts and tables, have efficient procedures

## What do we mean by Mastery?

- ***A mastery approach***: a set of principles and beliefs. This includes a belief that all pupils are capable of understanding and doing mathematics, given sufficient time. Pupils are neither 'born with the maths gene' nor 'just no good at maths'. With good teaching, appropriate resources, effort and a 'can do' attitude all children can achieve in and enjoy mathematics.

NCETM



## What do we mean by mastery?

The essential idea behind mastery is that **all children**<sup>2</sup> need a **deep** understanding of the mathematics they are learning so that:

- future mathematical learning is built on solid foundations which do not need to be re-taught;
- there is no need for separate catch-up programmes due to some children falling behind;
- children who, under other teaching approaches, can often fall a long way behind, are better able to keep up with their peers, so that gaps in attainment are narrowed whilst the attainment of all is raised.

There are generally four ways in which the term mastery is being used in the current debate about raising standards in mathematics:

- 1. A mastery approach:** a set of principles and beliefs. This includes a belief that all pupils are capable of understanding and doing mathematics, given sufficient time. Pupils are neither 'born with the maths gene' nor 'just no good at maths'. With good teaching, appropriate resources, effort and a 'can do' attitude all children can achieve in and enjoy mathematics.

- 2. A mastery curriculum:** one set of mathematical concepts and big ideas for all. All pupils need access to these concepts and ideas and to the rich connections between them. There is no such thing as 'special needs mathematics' or 'gifted and talented mathematics'. Mathematics is mathematics and the key ideas and building blocks are important for everyone.

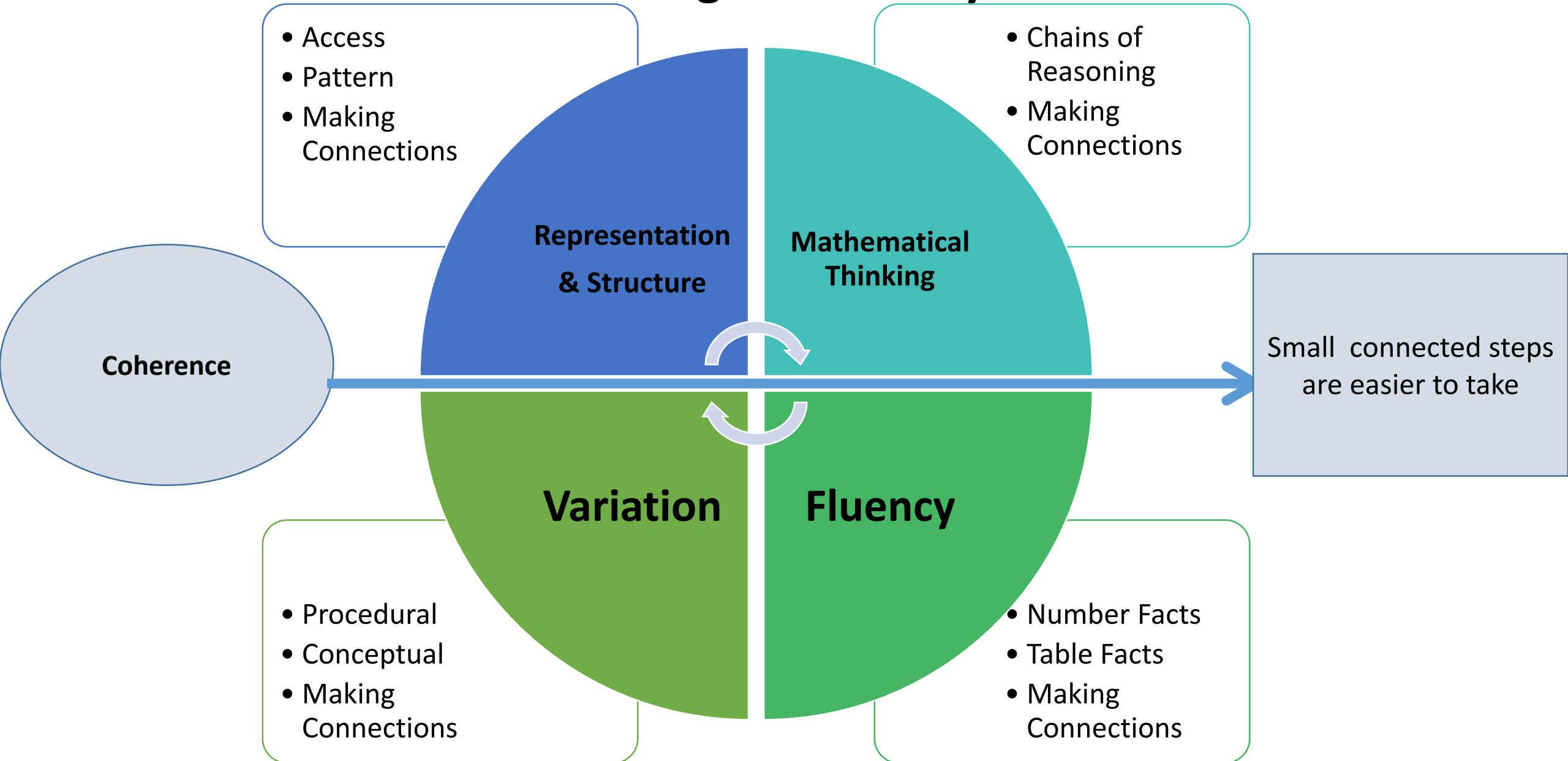
- 3. Teaching for mastery:** a set of pedagogic practices that keep the class working together on the same topic, whilst at the same time addressing the need for all pupils to master the curriculum and for some to gain greater depth of proficiency and understanding. Challenge is provided by going deeper rather than accelerating into new

mathematical content. Teaching is focused, rigorous and thorough, to ensure that learning is sufficiently embedded and sustainable over time. Long term gaps in learning are prevented through speedy teacher intervention. More time is spent on teaching topics to allow for the development of depth and sufficient practice to embed learning. Carefully crafted lesson design provides a scaffolded, conceptual journey through the mathematics, engaging pupils in reasoning and the development of mathematical thinking.

- 4. Achieving mastery of particular topics and areas of mathematics.** Mastery is not just being able to memorise key facts and procedures and answer test questions accurately and quickly. It involves knowing 'why' as well as knowing 'that' and knowing 'how'. It means being able to use one's knowledge appropriately, flexibly and creatively and to apply it in new and unfamiliar situations.<sup>3</sup> The materials provided seek to exemplify the types of skills, knowledge and understanding necessary for pupils to make good and sustainable progress in mastering the primary mathematics curriculum.

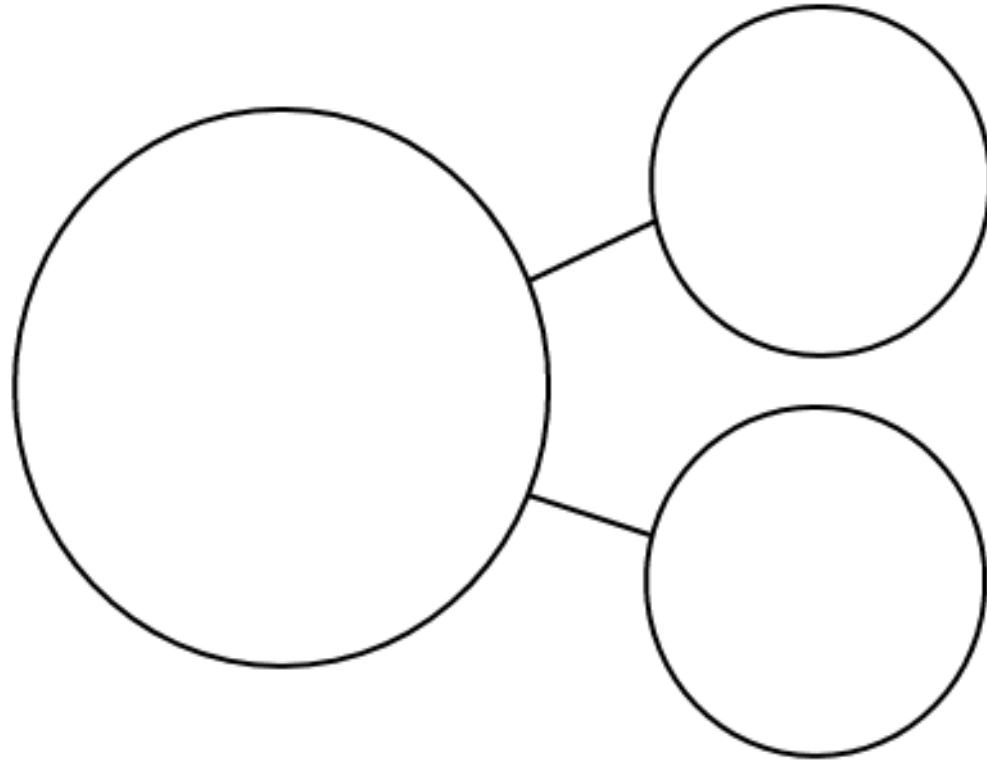
<https://www.ncetm.org.uk/resources/46689>

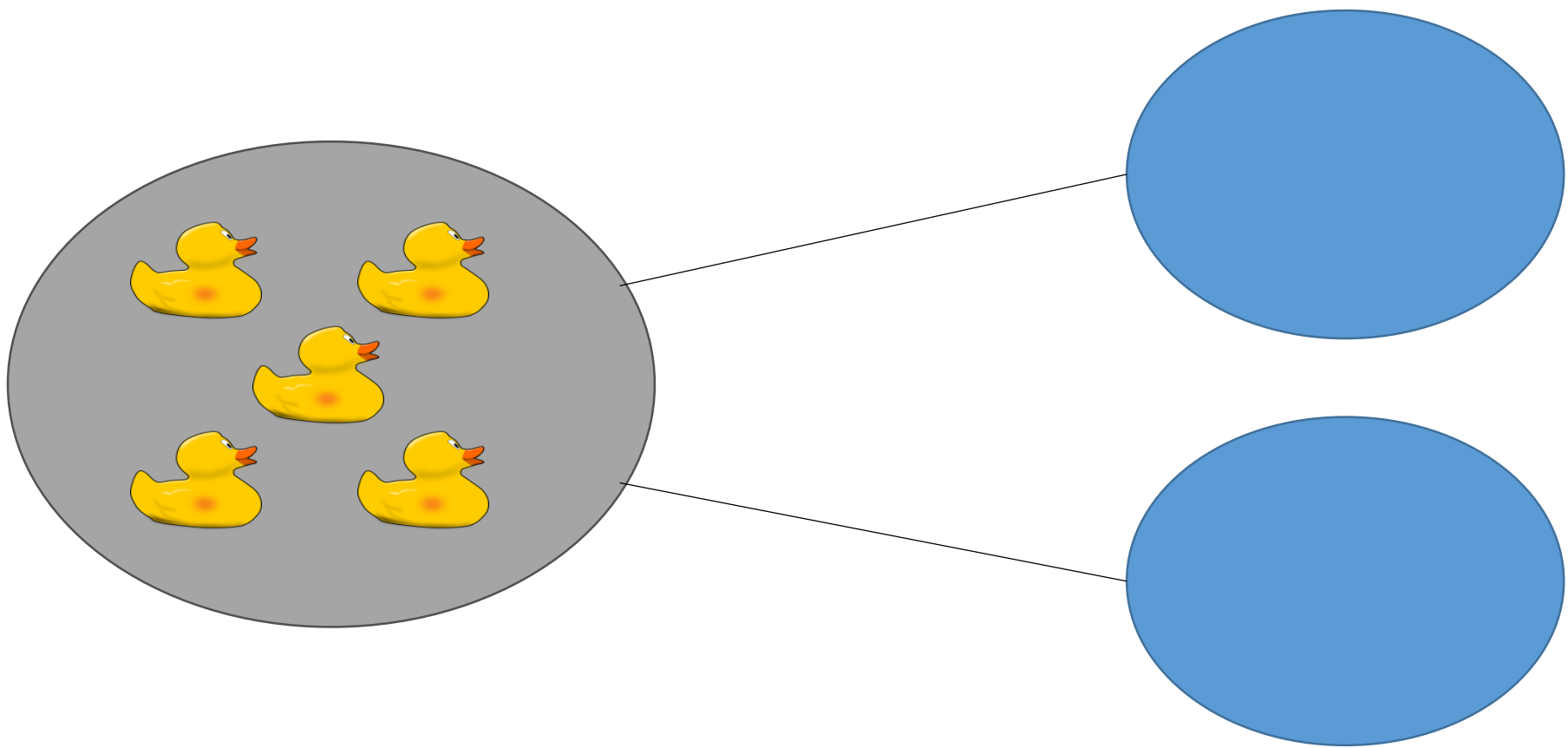
# Teaching for Mastery

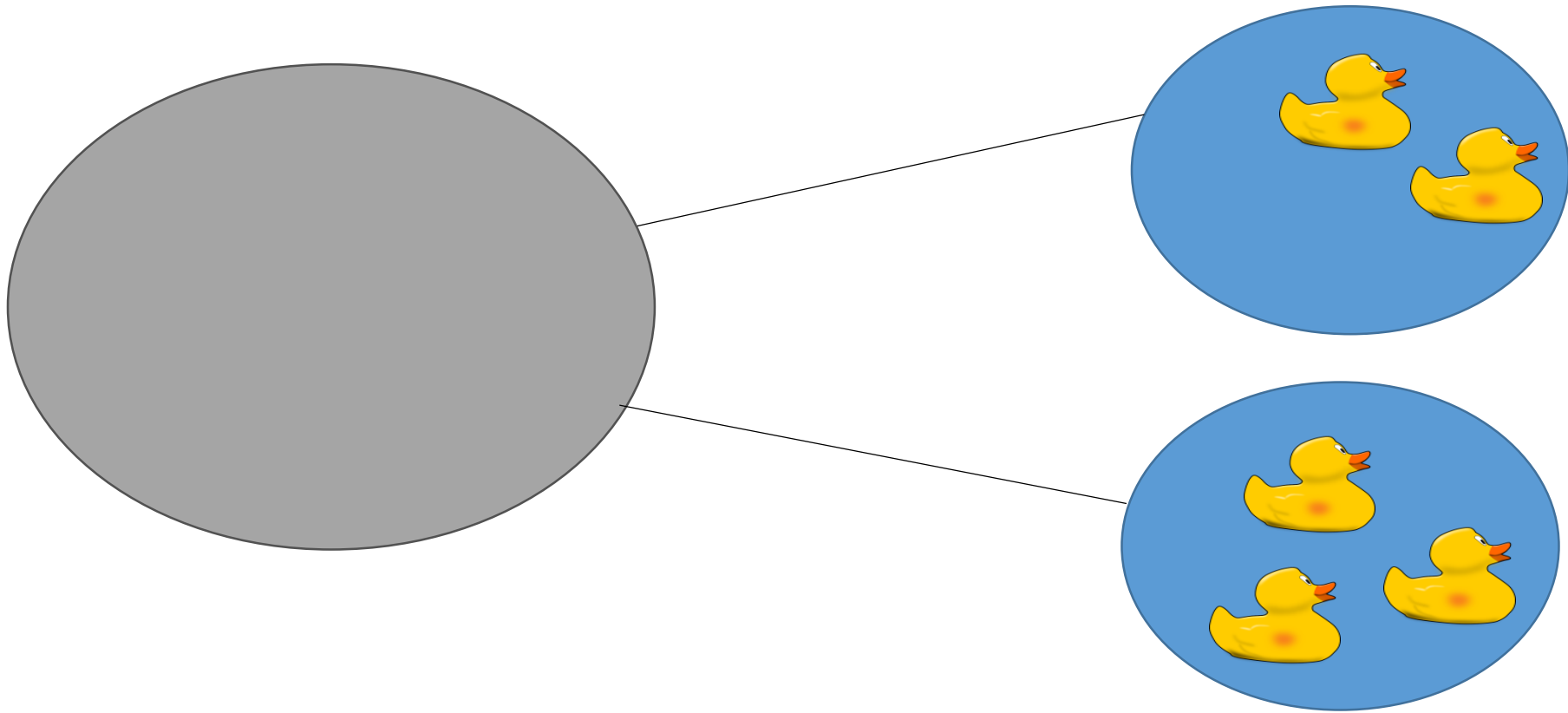


# Partitioning numbers in Year 1

## The Part Part Whole Model

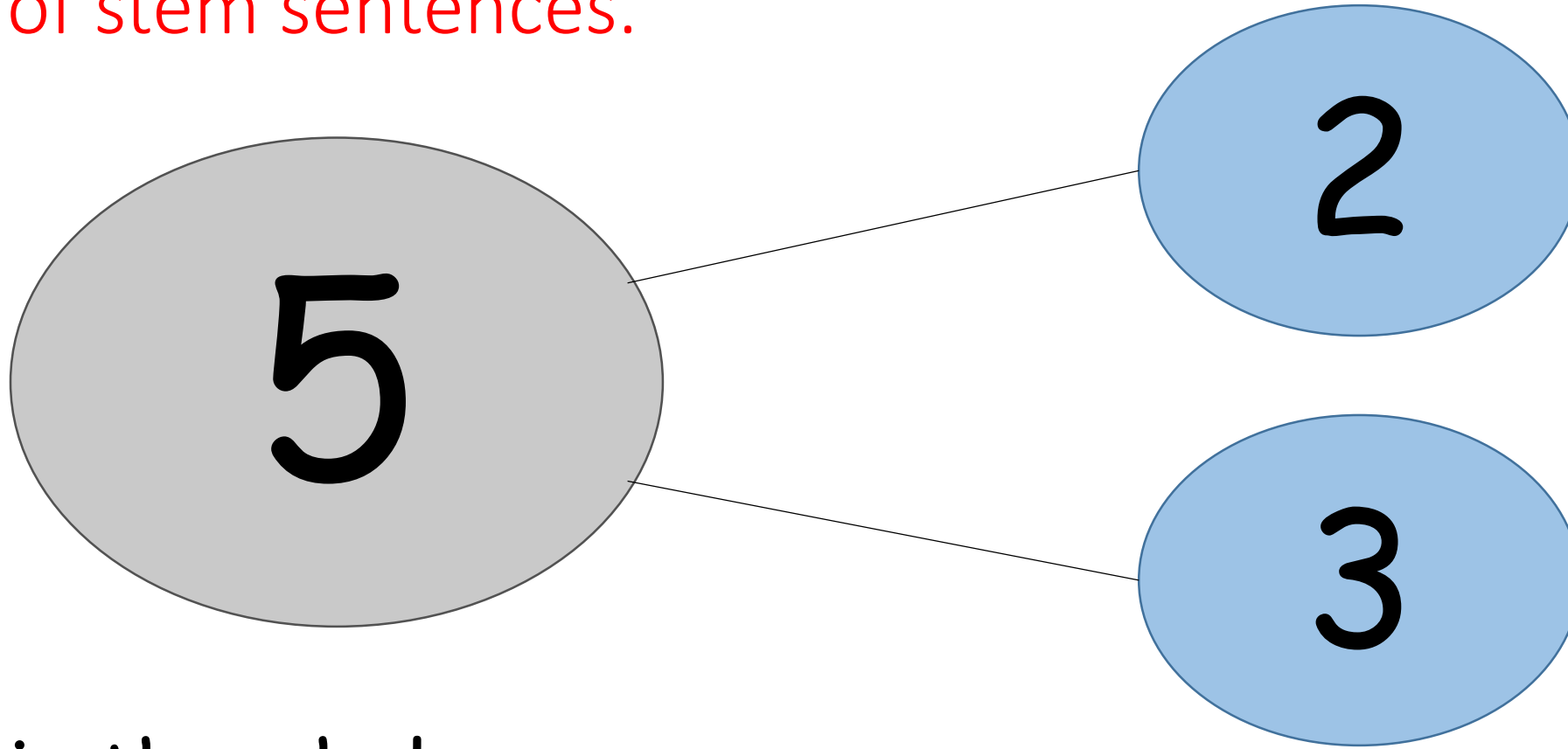








Use of stem sentences.

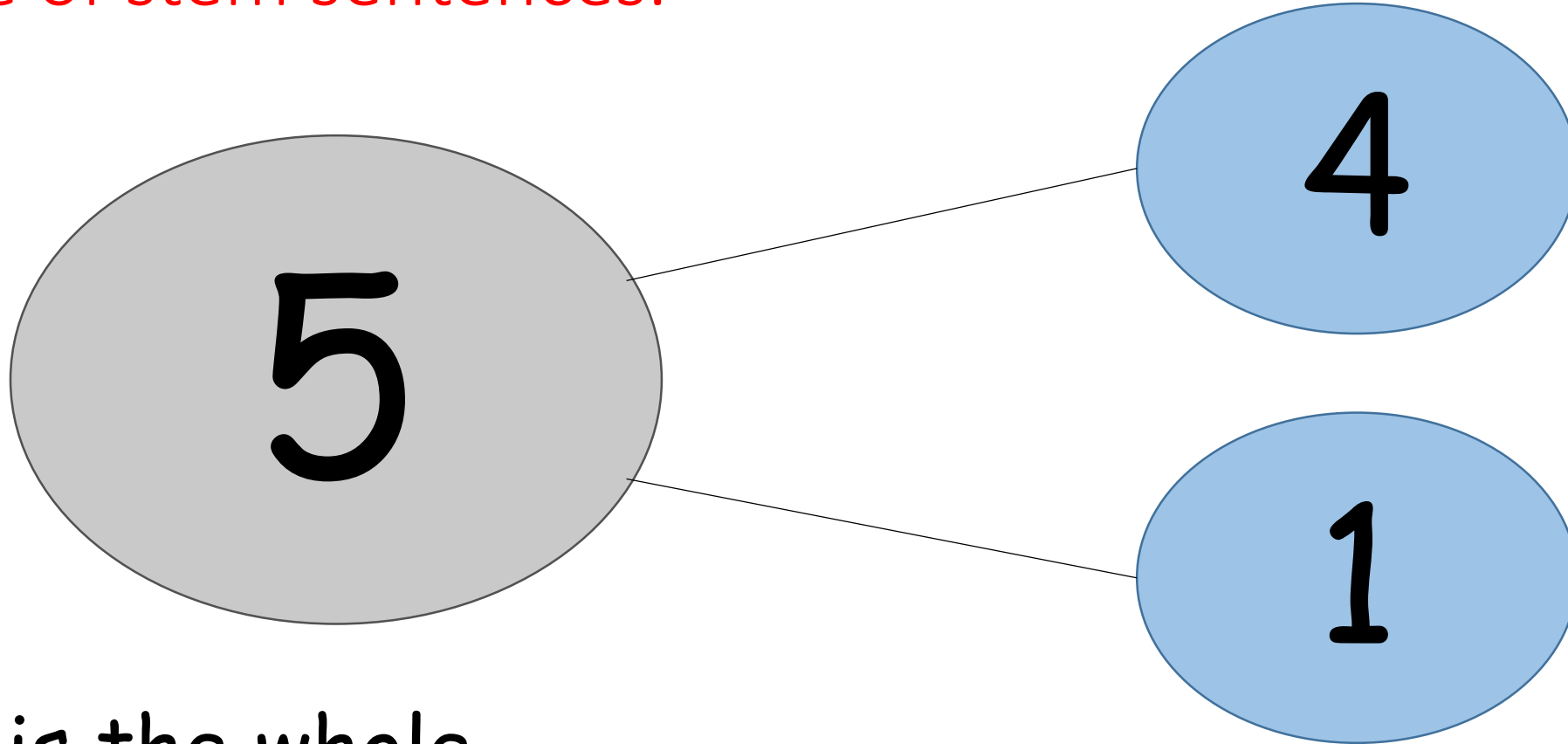


5 is the whole.

2 is a part.

3 is a part.

Use of stem sentences.

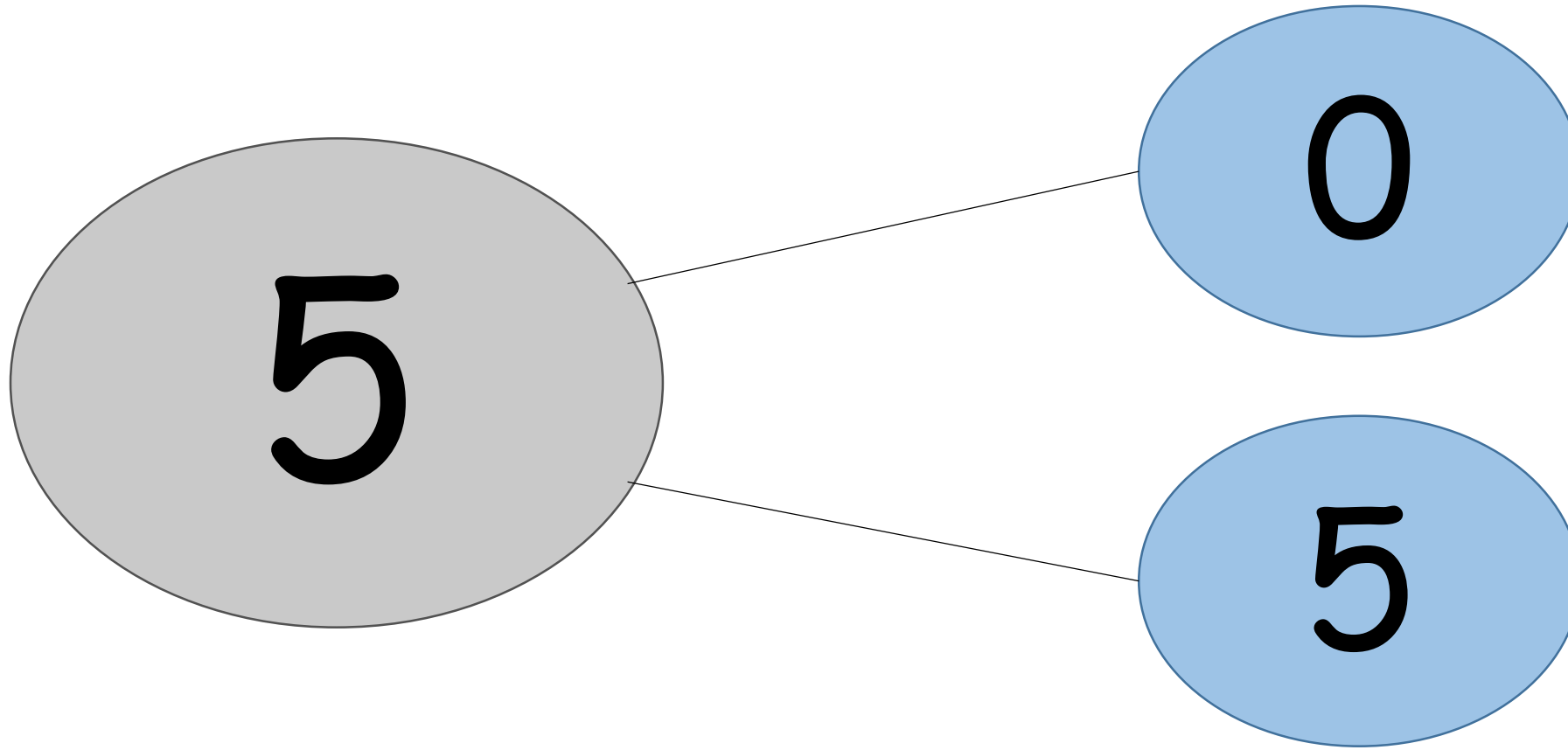


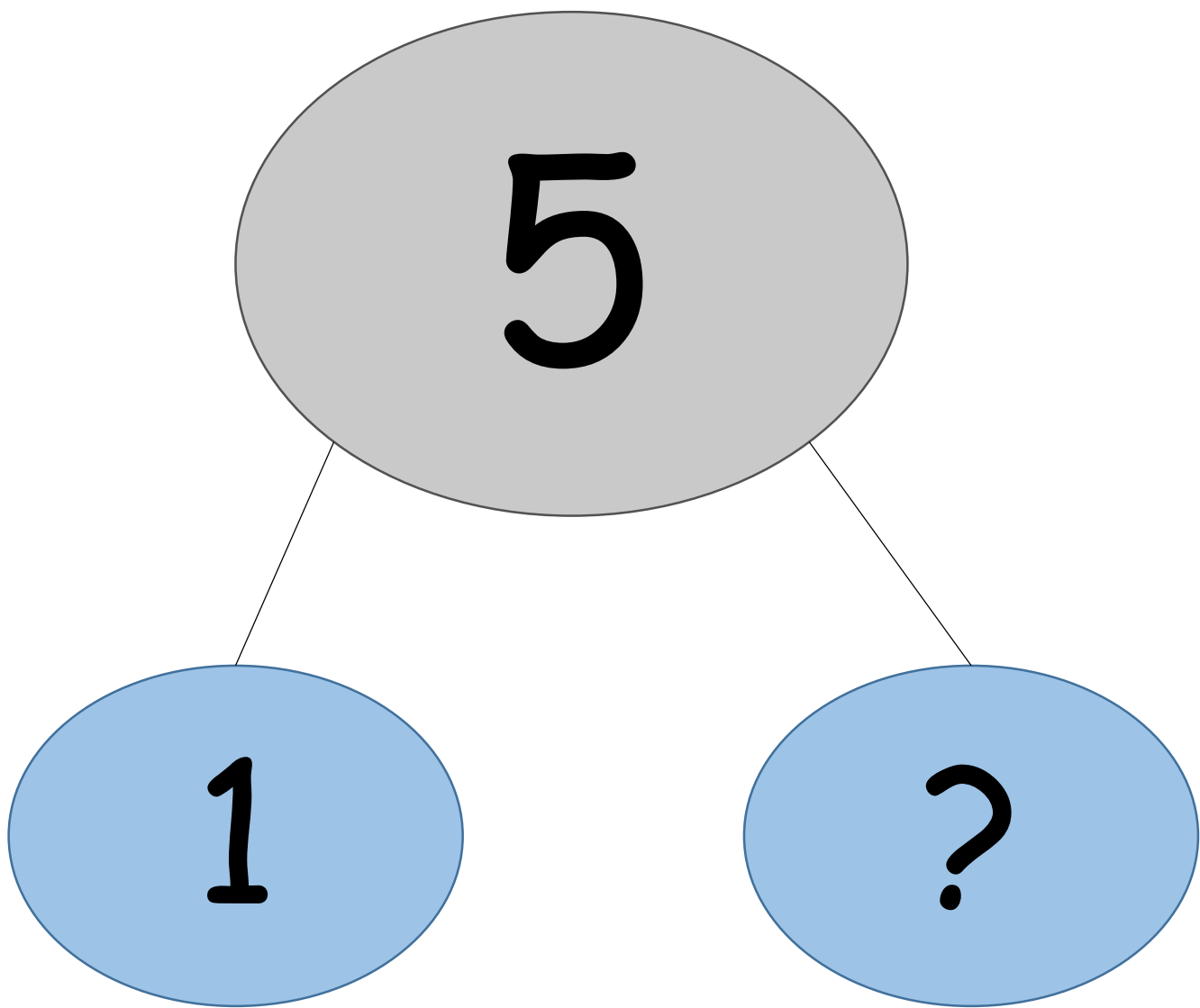
5 is the whole.

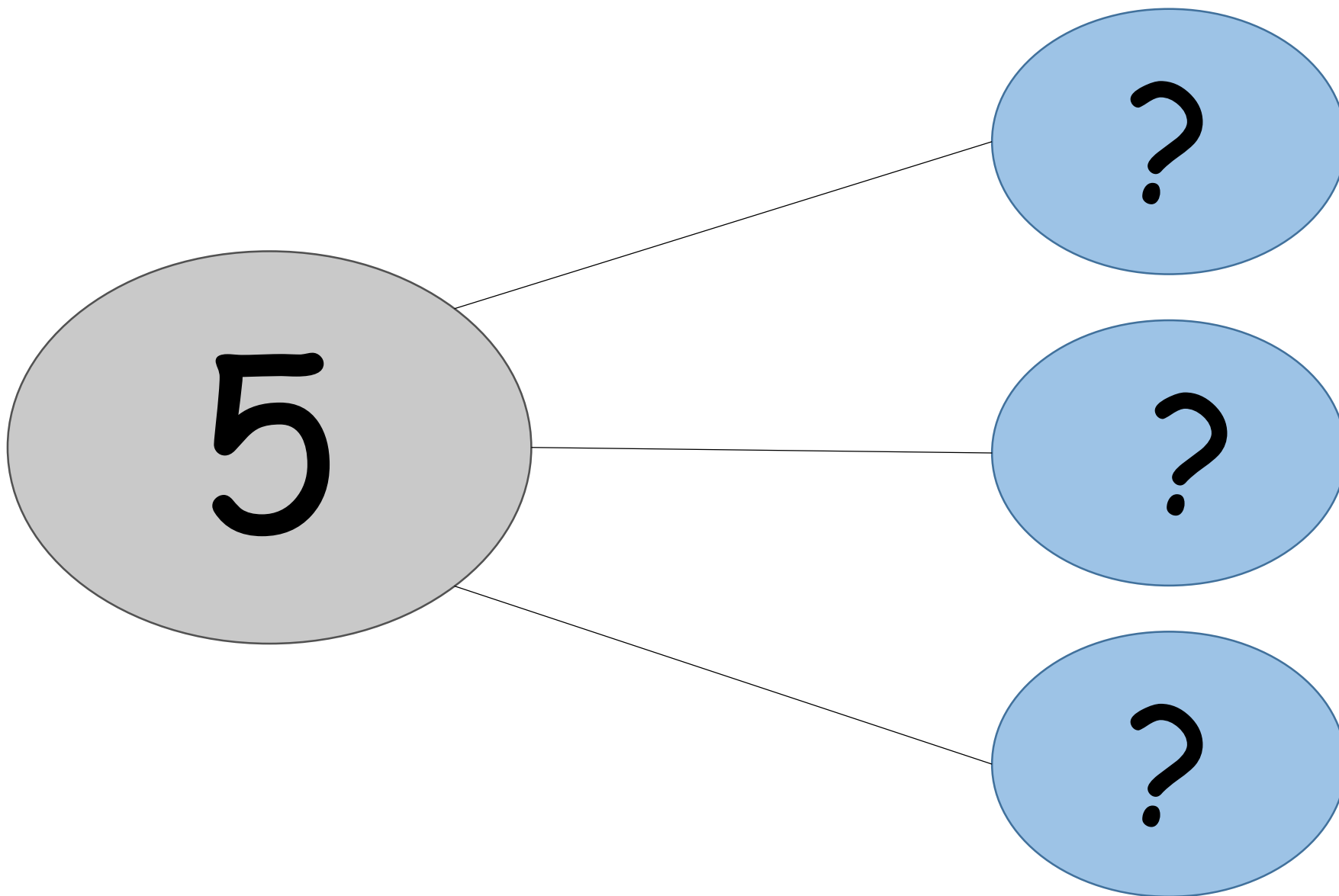
4 is a part.

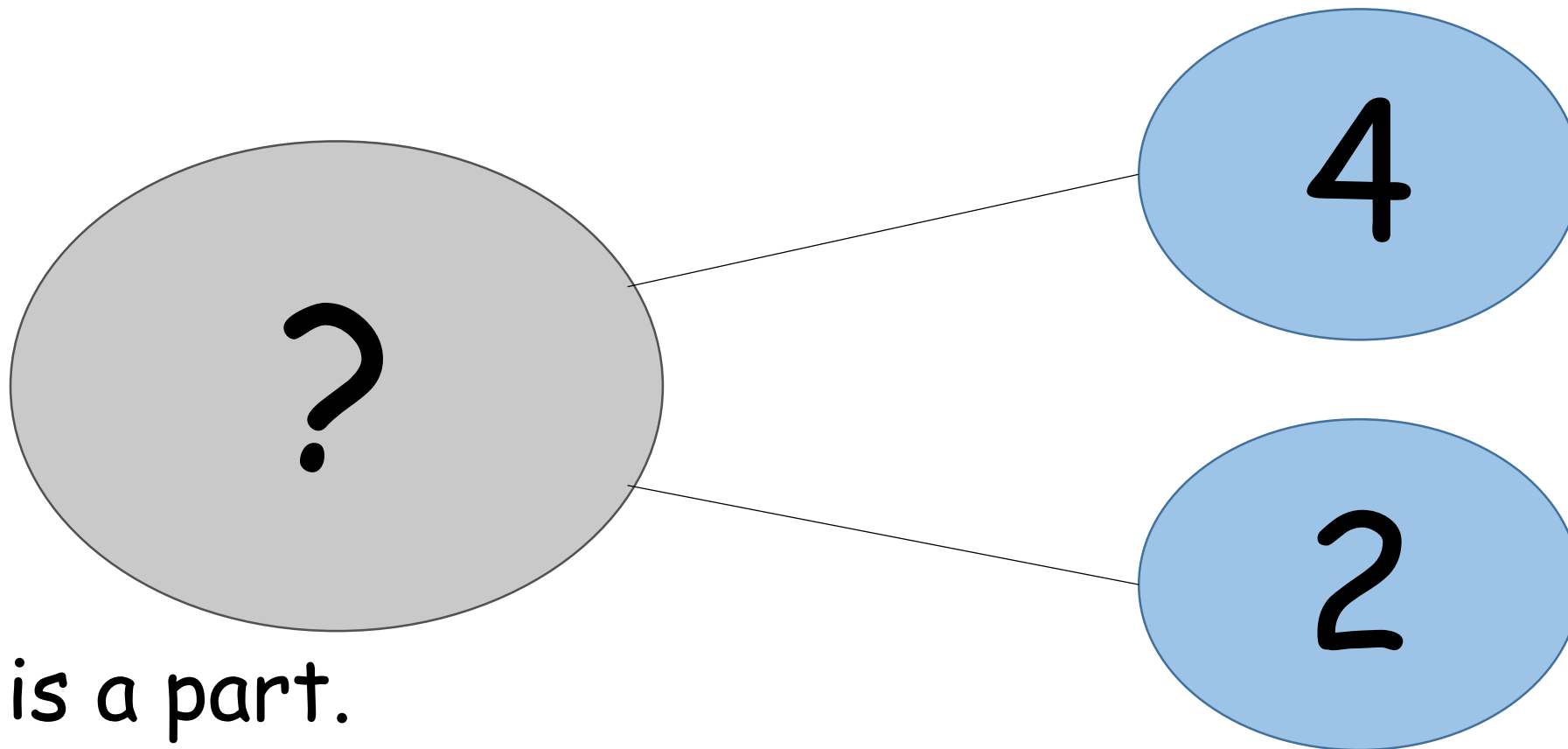
1 is a part.

Also use zero.





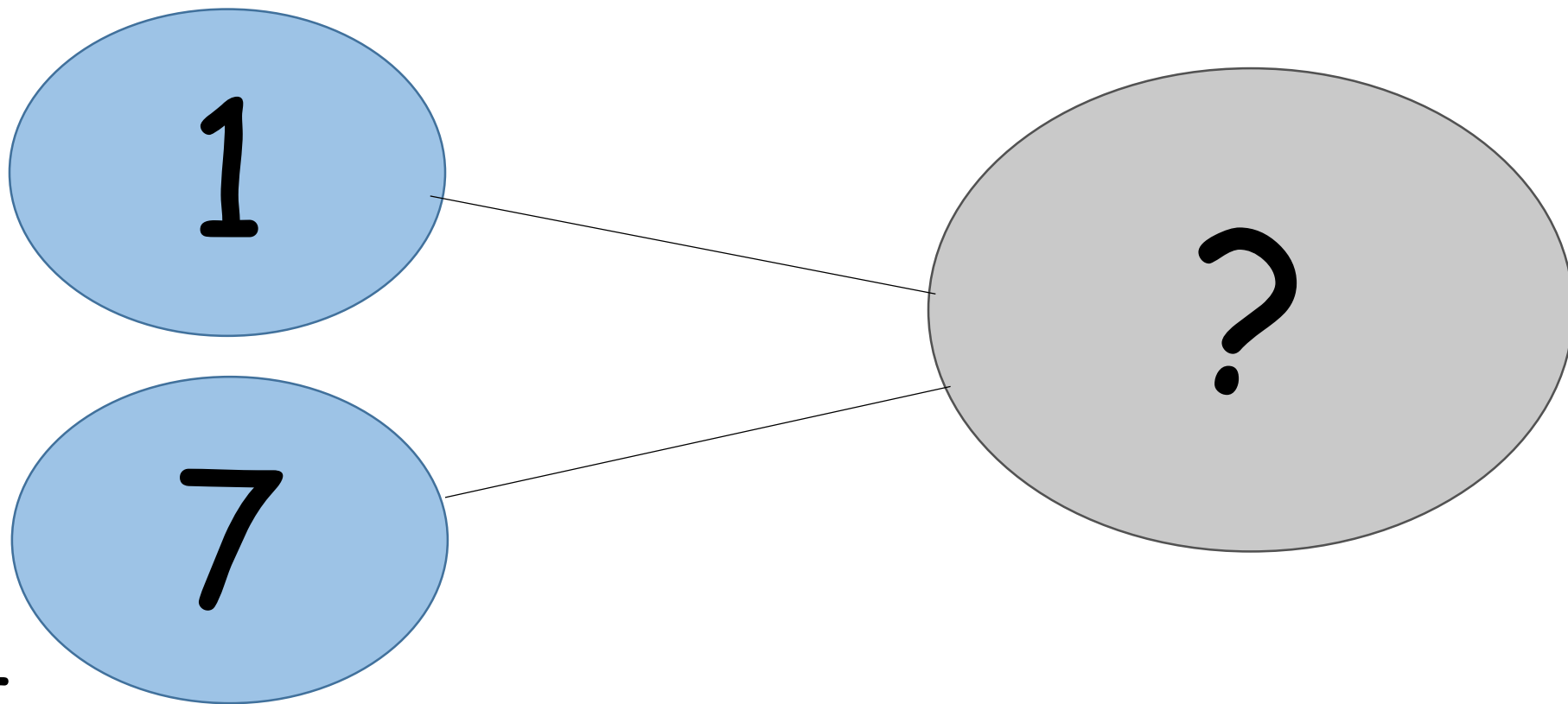




4 is a part.

2 is a part.

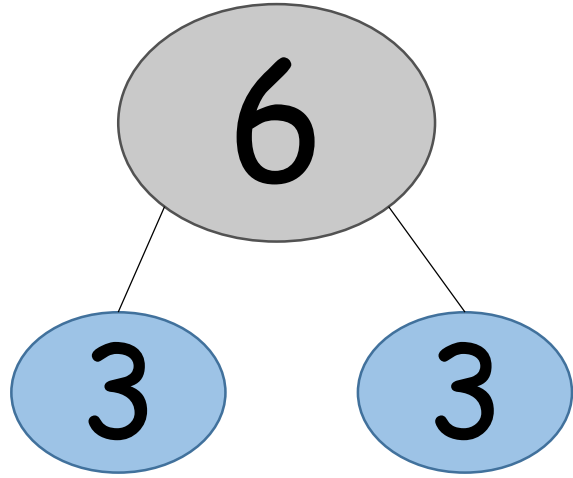
6 is the whole



1 is a part.

7 is a part.

8 is the whole

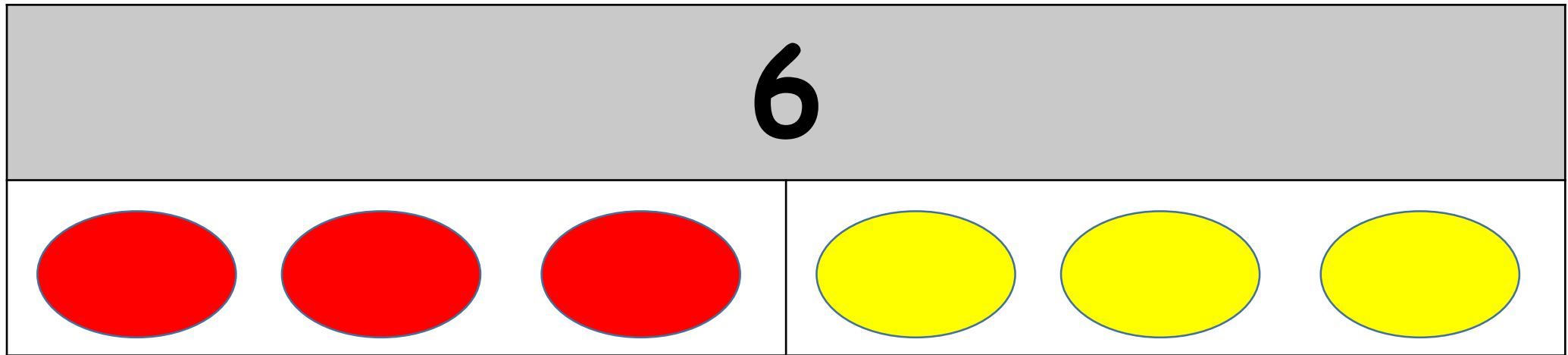


Use of stem sentences.

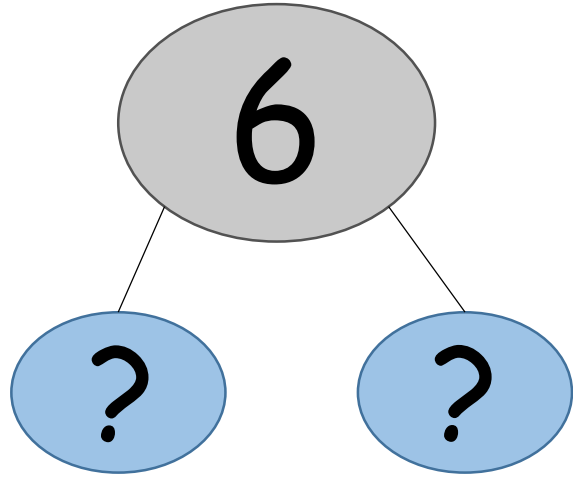
3 is a part.

3 is a part.

6 is the whole

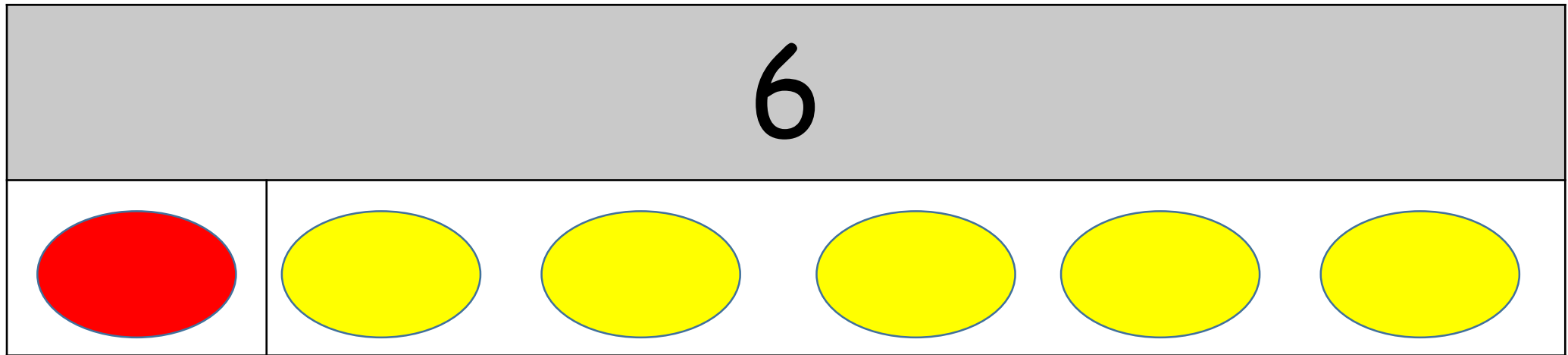




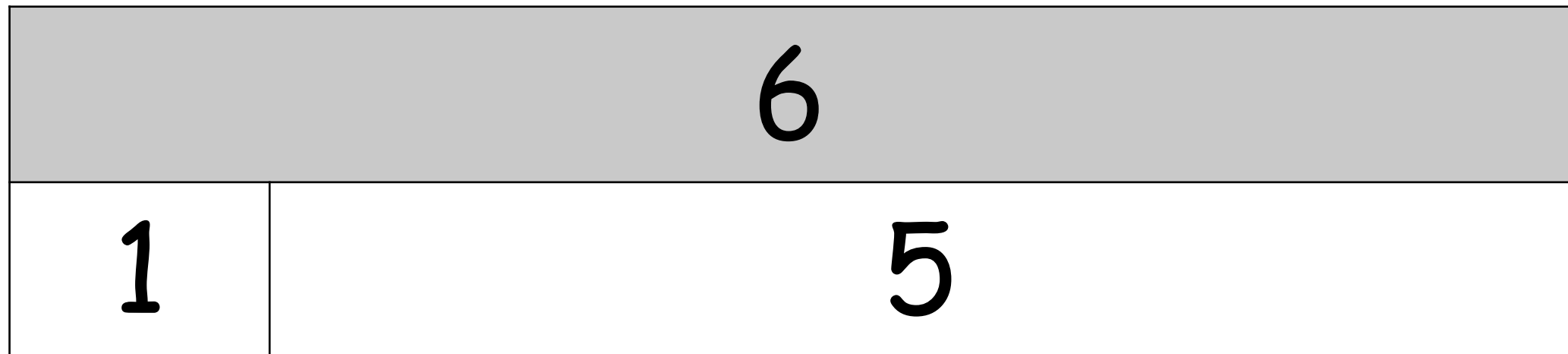
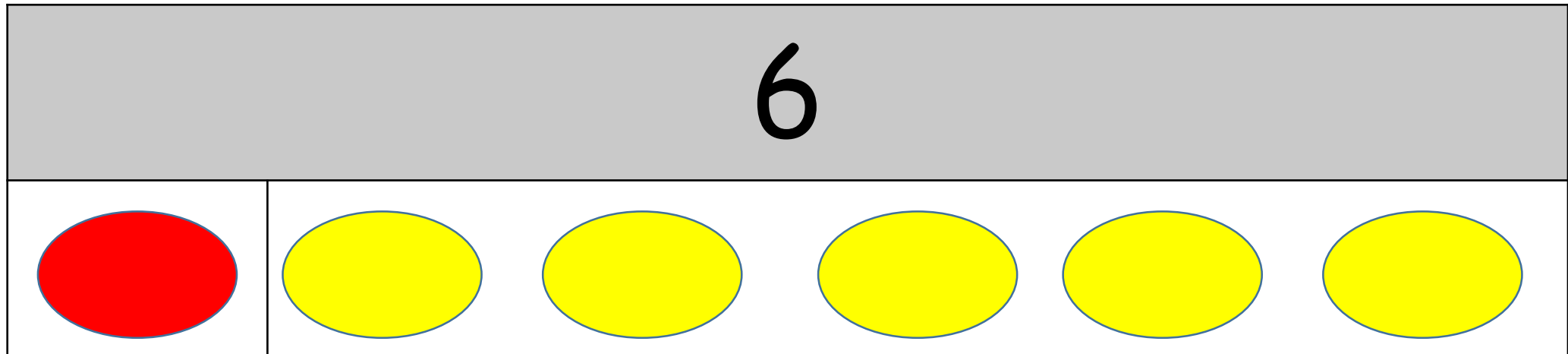


Use of stem sentences.

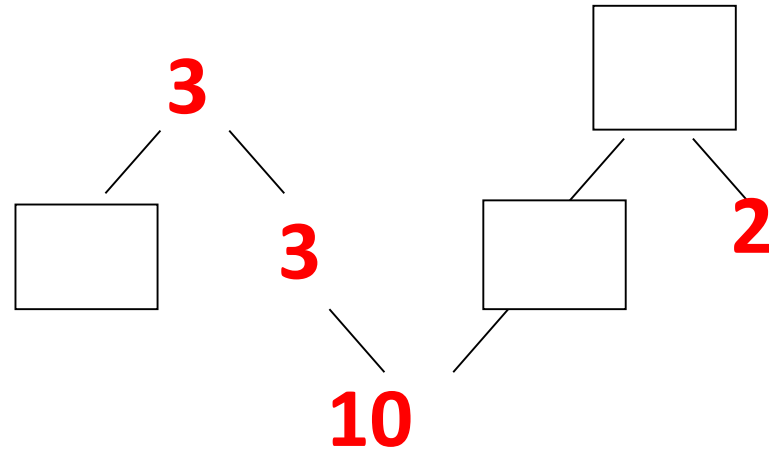
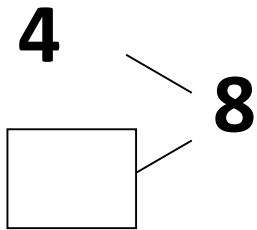
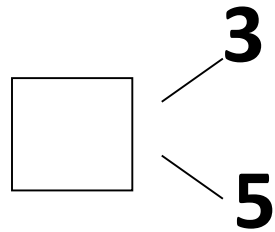
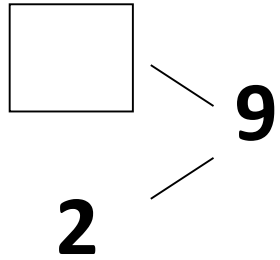
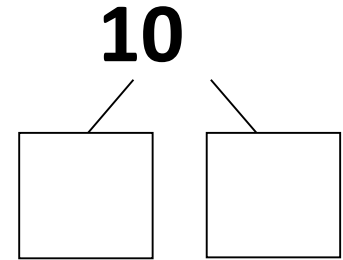
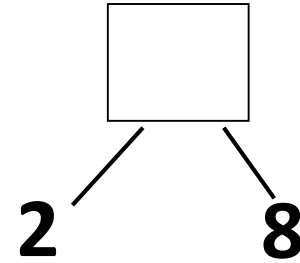
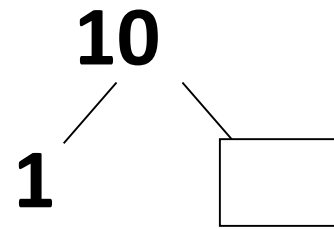
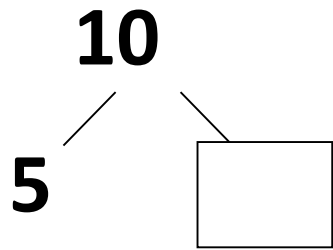
6 is the whole  
1 is a part.  
5 is a part.



Move from pictorial/ symbolic to abstract.

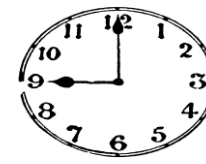


# Mastery of the part part whole model!





Subtraction within a context



What does the 6 represent?

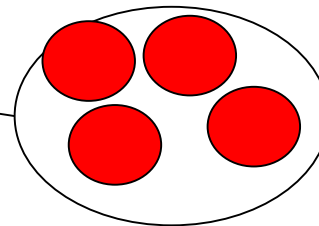
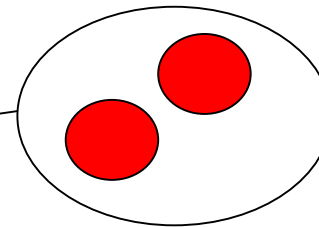
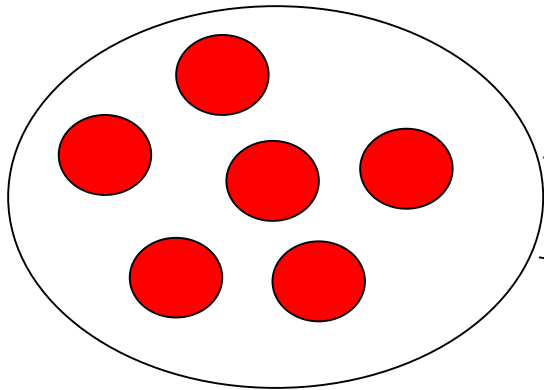
What does the 2 represent?

What does the 4 represent?

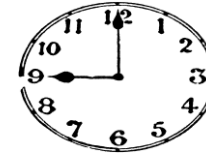
Before

Next

Now



$$6 - 2 = 4$$



Before

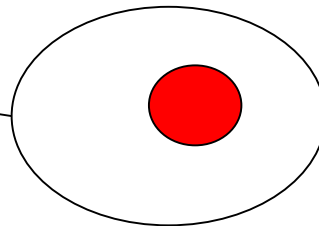
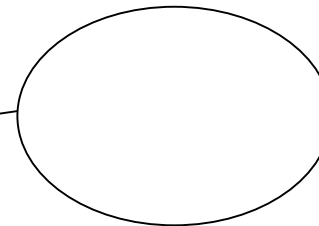
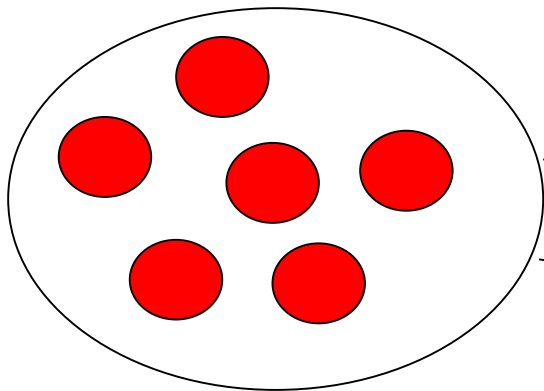
?  
Next

Now

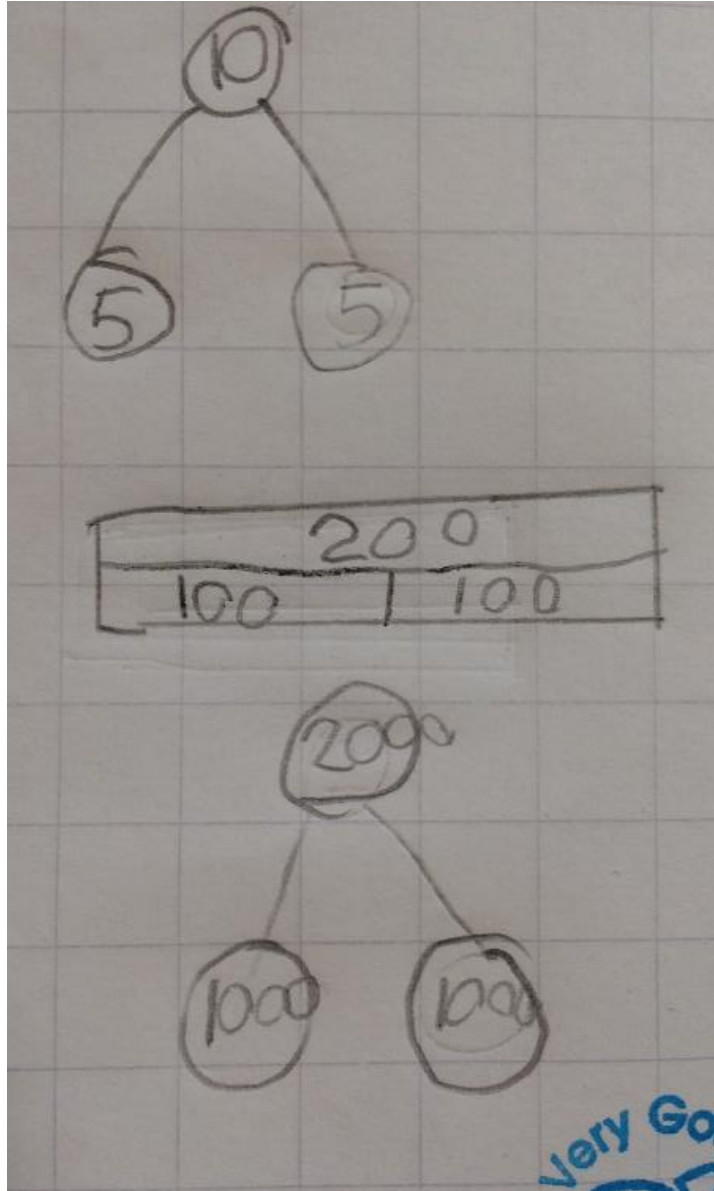
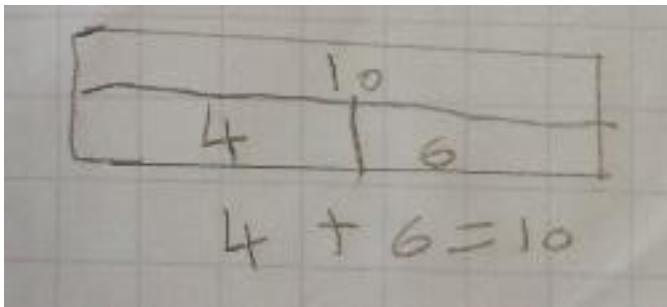
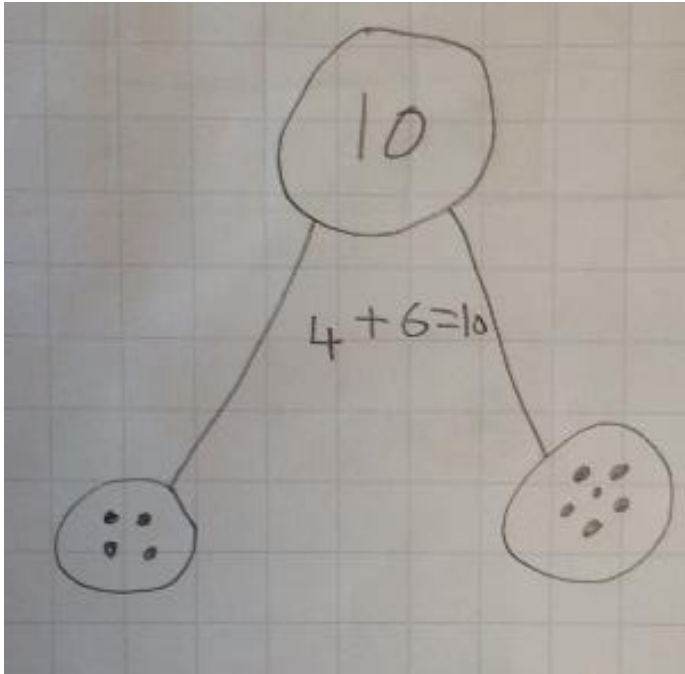
What does the 6  
represent?

What does the 5  
represent?

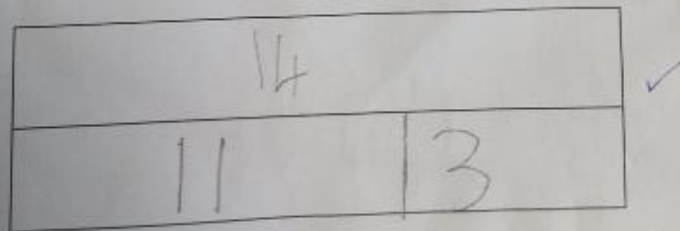
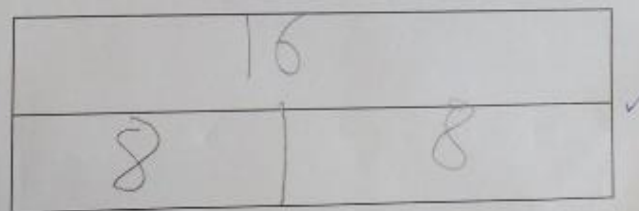
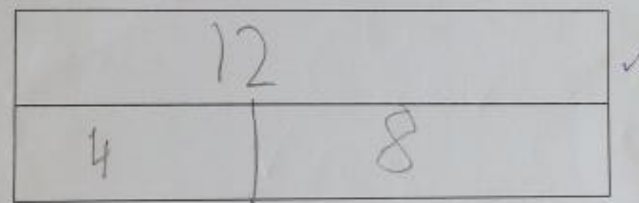
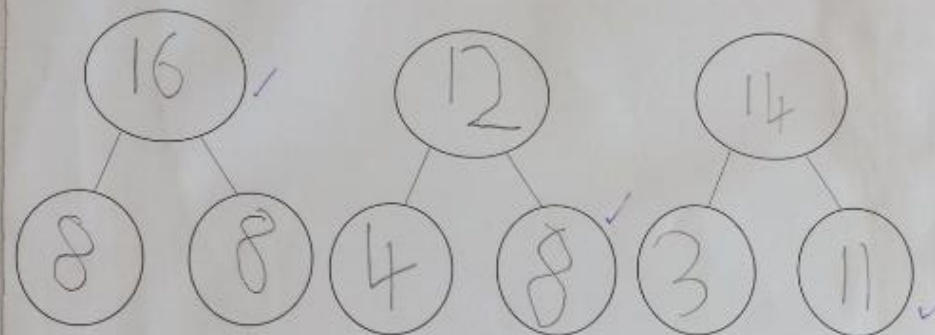
What does the 1  
represent?



$$6 - 5 = 1$$



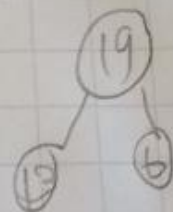
Can you represent what you can see on the coat hangers with these models?



$$8 - 6 = 2$$



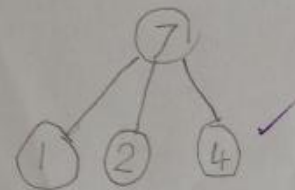
$$19 - 13 = 6$$



$$15 - 6 = 9$$



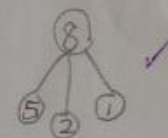
$$1 + 2 + 4 = 7$$



$$2 + 3 + 0 = 5$$



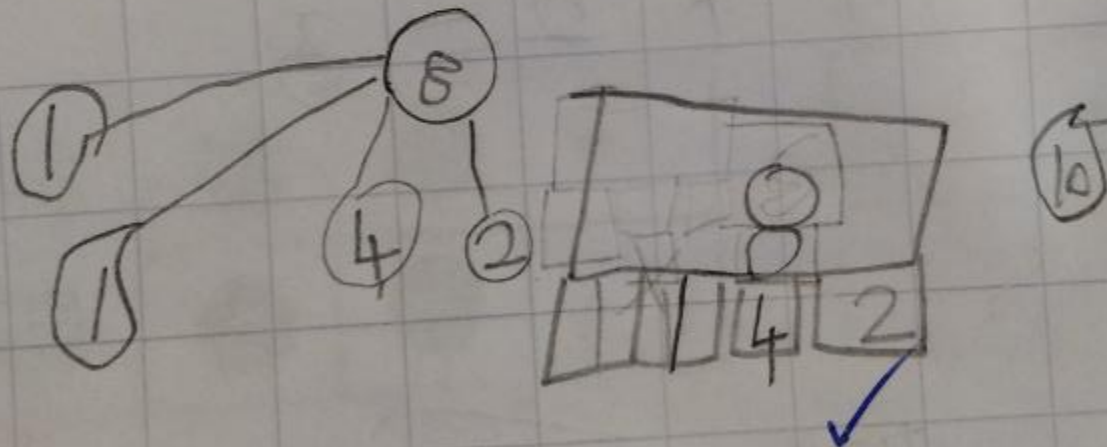
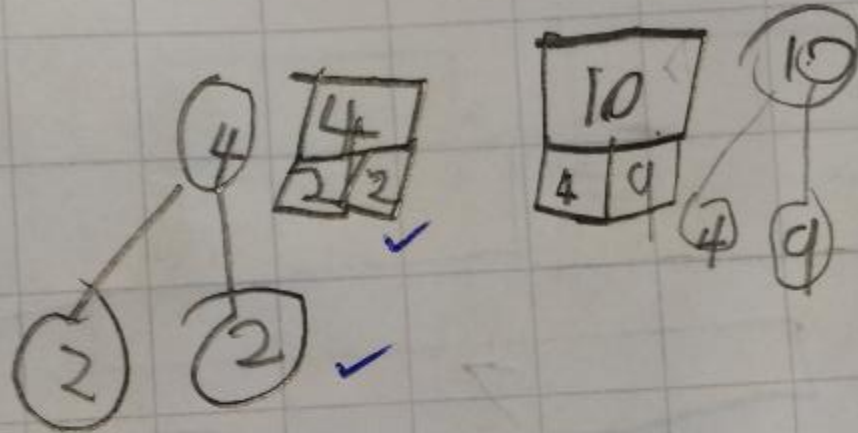
$$5 + 2 + 1 = 8$$



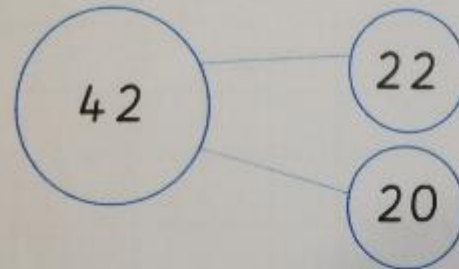
$$1 + 2 + \boxed{5} = 8$$







Can you write number sentences to go with this PPW model?



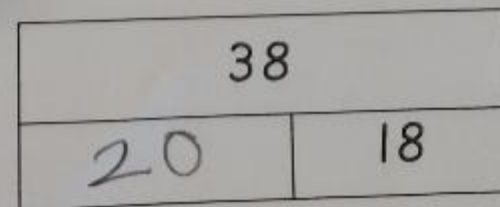
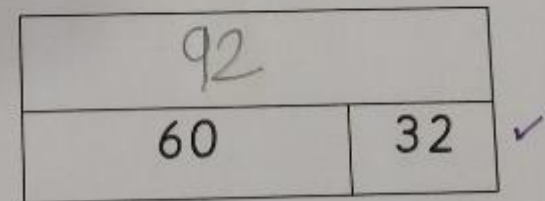
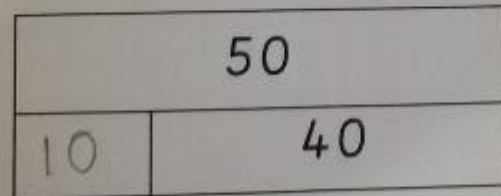
$$42 - 22 = 20 \checkmark$$

$$42 - 20 = 22 \checkmark$$

$$20 + 22 = 42 \checkmark$$

$$22 + 20 = 42 \checkmark$$

Can you find the missing numbers in these bar models?



Year 2



