

South Yorkshire Maths Hub is conducting a workgroup using Bars to translate worded problems into models to improve students' Problem Solving skills at KS2 & 3. Additionally the group is investigating the use of a bar model puzzle practice app (Bar Logik) to familiarise students with the reasoning behind solving problems using bars, and reflecting on the relative impact of each.

This workshop will give participants a flavour of the different problem solving lessons trialled with learners and try out some of the problems for yourselves. There will be an update on how schools feel this is impacting on their learners so far.

*There will also be an opportunity **to trial / see in action** the Bar Logik practice app and reflect on how this has been impacting on South Yorkshire schools and how it might support your learners mathematical reasoning skills.*

Solving worded problems using bar models

A presentation by Pete Sides

April 2017

*Learning from each other;
locally, nationally & internationally*

*Helping teachers to develop
as reflective practitioners*

Proposal for the work group

- Implement a problem solving learning strategy to explore the specific aspect of bar modelling in a flexible but structured way
- Share reflections and encourage a collaborative dialogue and wider exploration of classroom practice
- Develop a set of proposals for schools to implement a similar successful strategy, supported by appropriate teaching materials.

Intended outcomes for teachers

By using bar models with their students in this way

- Teachers to appreciate the positive effect of using diagrammatical representations of mathematical structures
- Teachers will be encouraged to incorporate more problem solving & reasoning experiences into their lessons
- Teachers experience greater collaborative dialogue and reflection with other colleagues

Intended outcomes for learners

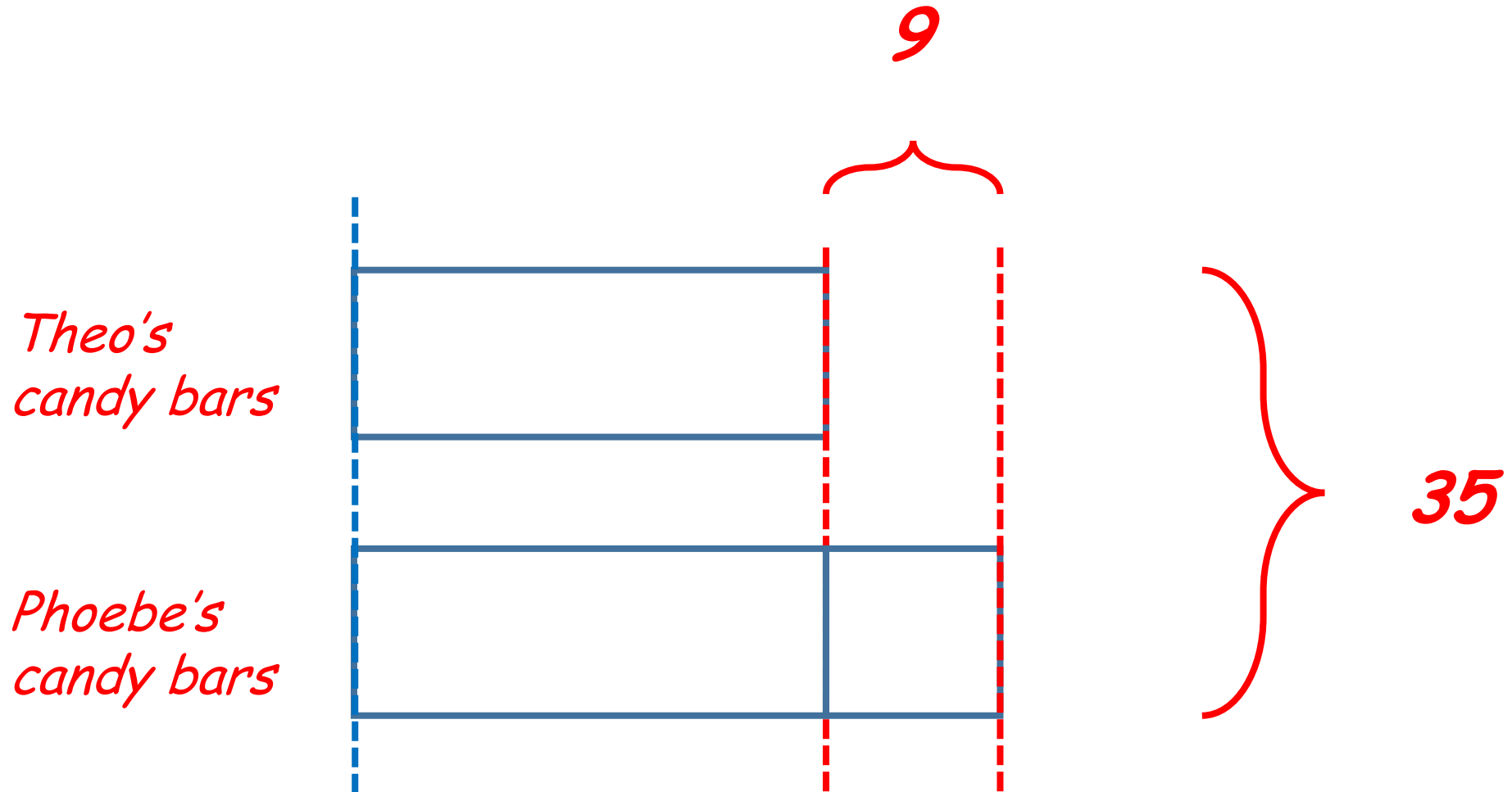
By learning to use bar models in this way

- Learners experience more explicit problem solving and mathematical reasoning
- Learners develop greater confidence in tackling worded problems
- Pupils gain a deeper sense of number and pre-algebra structures

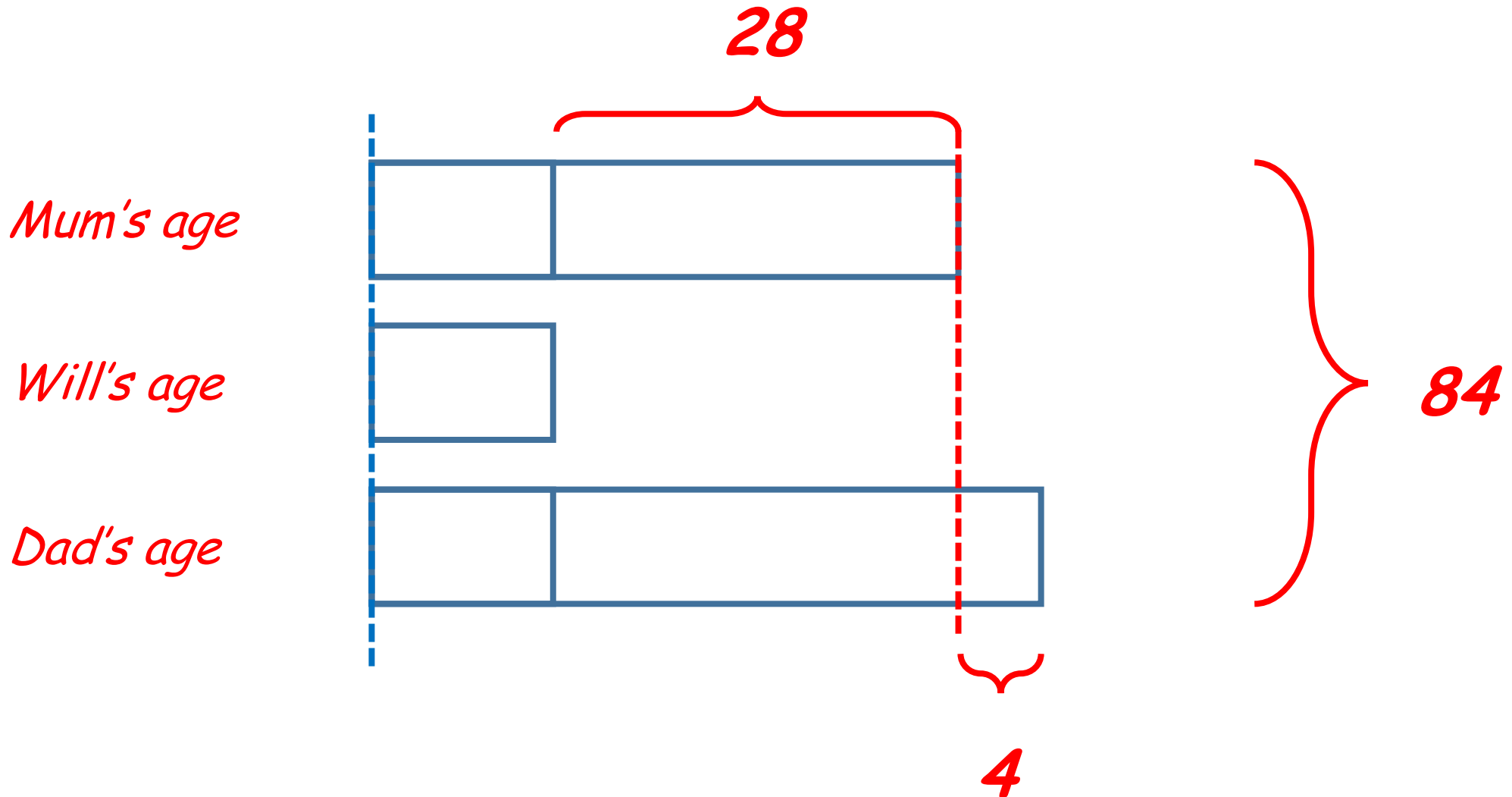
Hypothesis

- Bar Models can significantly support the development of students' mathematical progress.

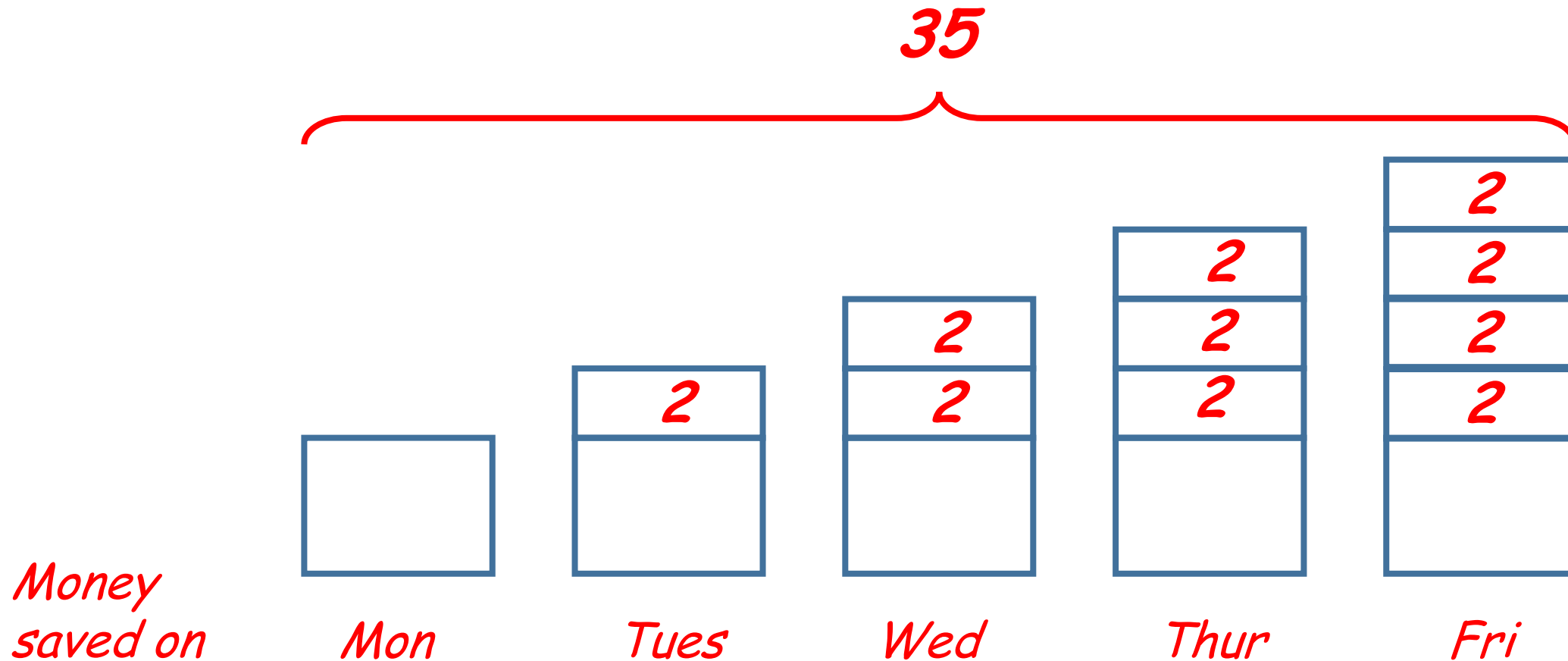
Theo and Phoebe each have some candy bars. Theo has 9 fewer candy bars than Phoebe. In all they have 35 candy bars.

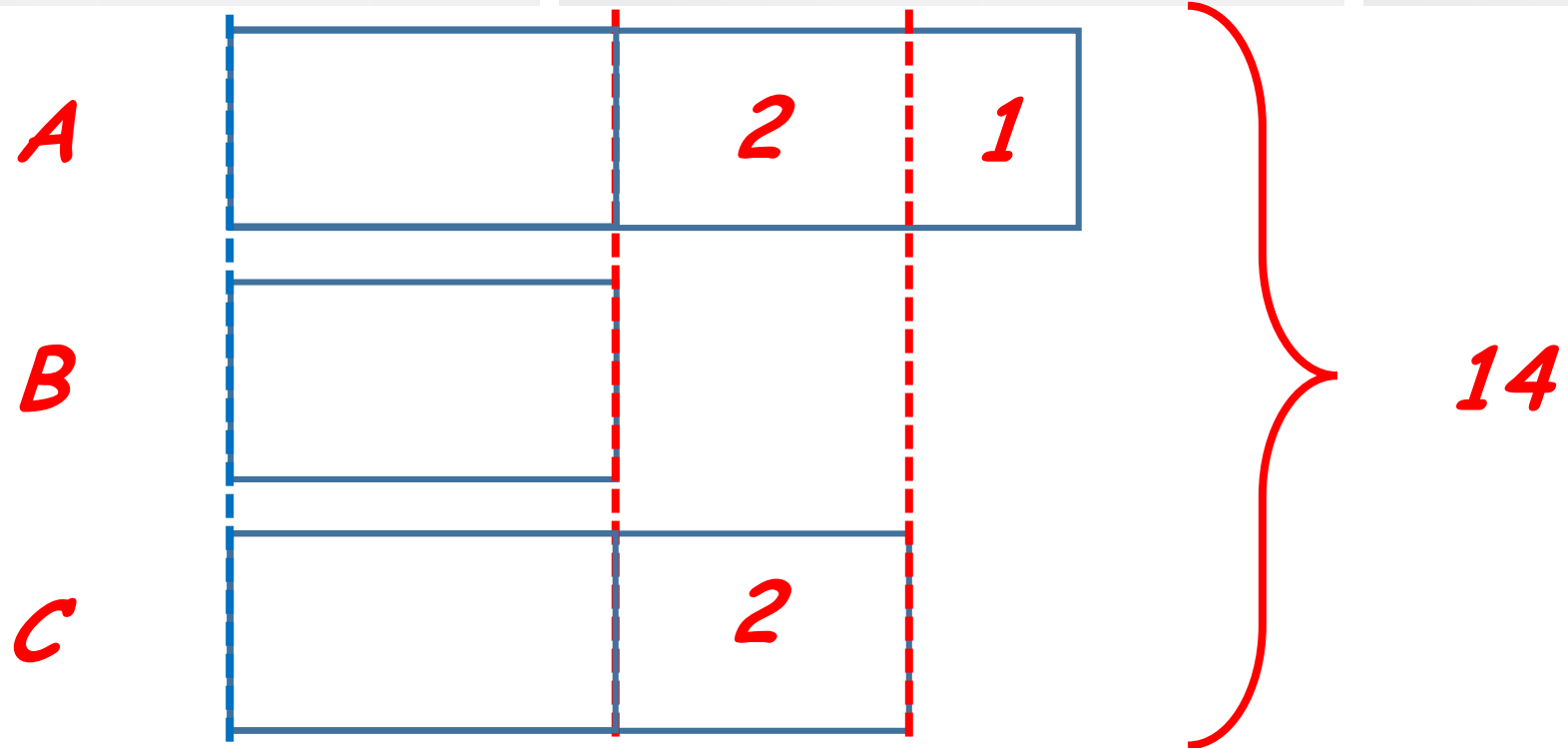
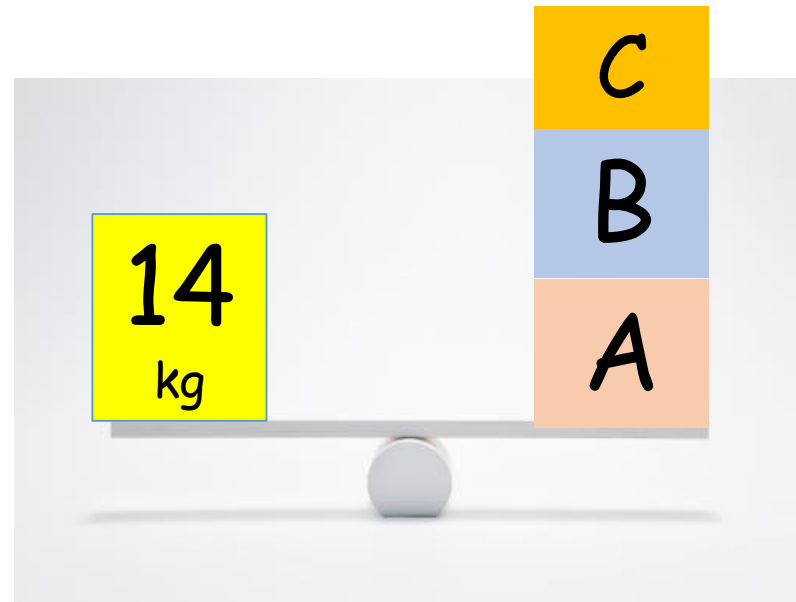
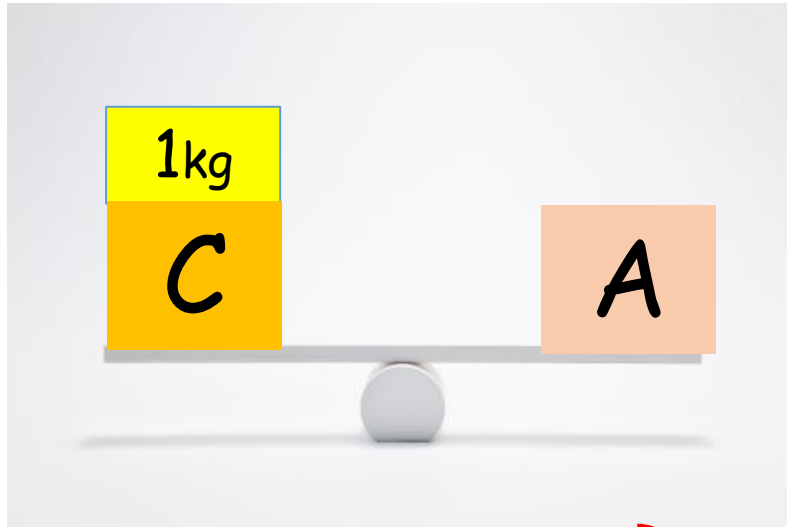
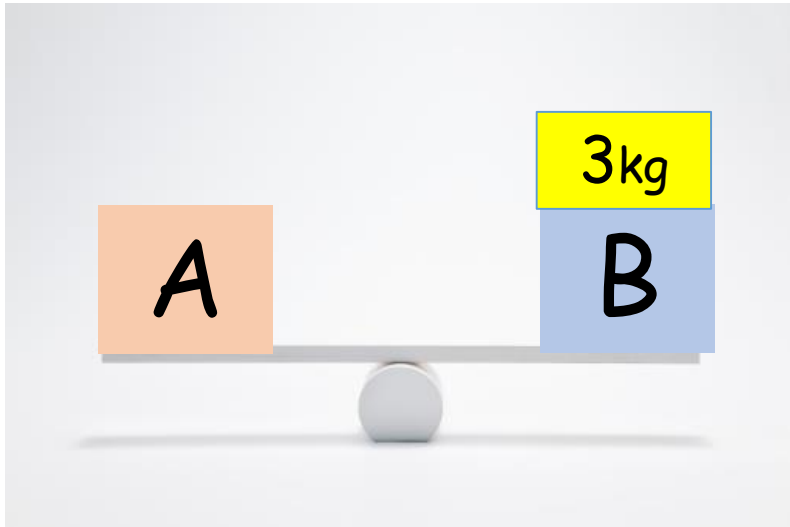


Mum is 28 years older than Will. Mum is 4 years younger than Dad. Their total ages is 84 years.



Charlie started saving some money on Monday.
Each day she saved £2 more than the previous day.
By Friday of that week she had saved £35





Generic lesson strategy

Address one problem/arithmetical structure as a whole class

Introduce basic structure with exemplar question(s)

- Explore as a class and draw out key elements
- Mini-practice

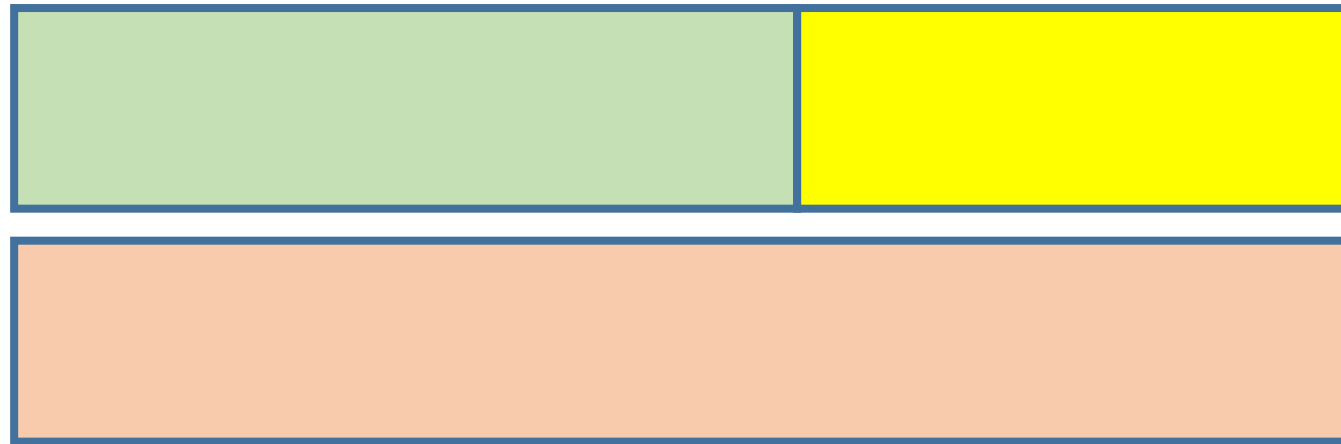
Introduce procedural variation

- Explore as a class and draw out key elements
- Mini-practice

Independent mixed practice

Problem structures

One model contains numerous possible problem or arithmetical structures

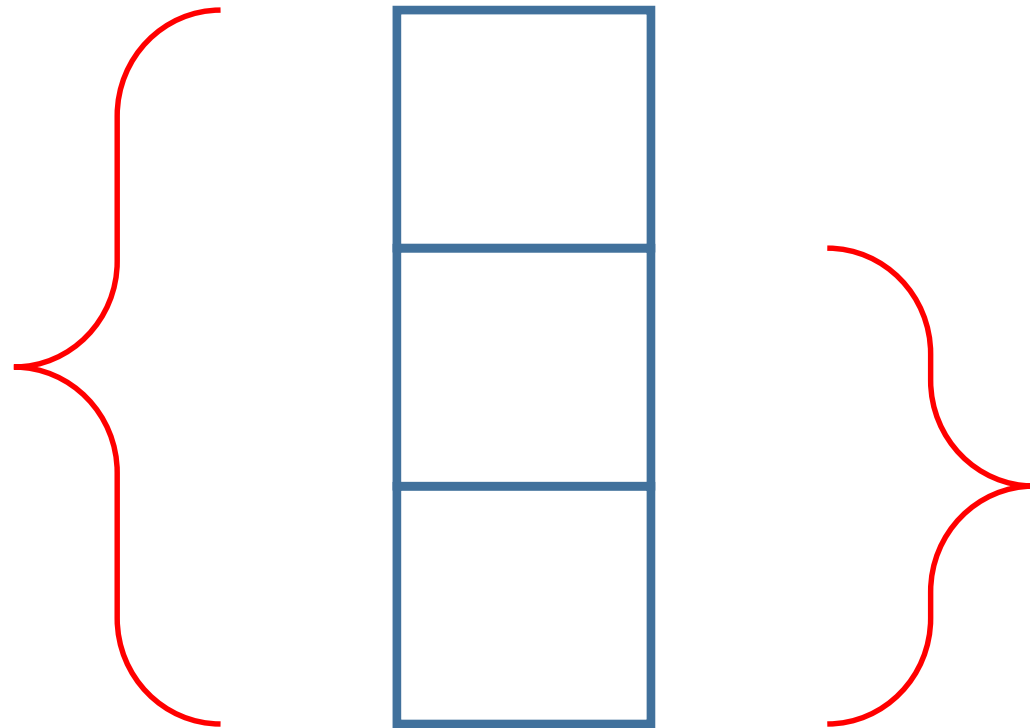


Procedural variance

Andy has three pets and Bobby has four pets.
How many do they have altogether?

Mia and Daisy have nine sweets altogether.
Mia has six sweets, how many does Daisy have?

If two-thirds of a number is 90.
What's the number?



Communicating a solution

Problem

Model

Maths

Answer

Solution

*Logical
mathematical
reasoning*

Using IRIS Connect

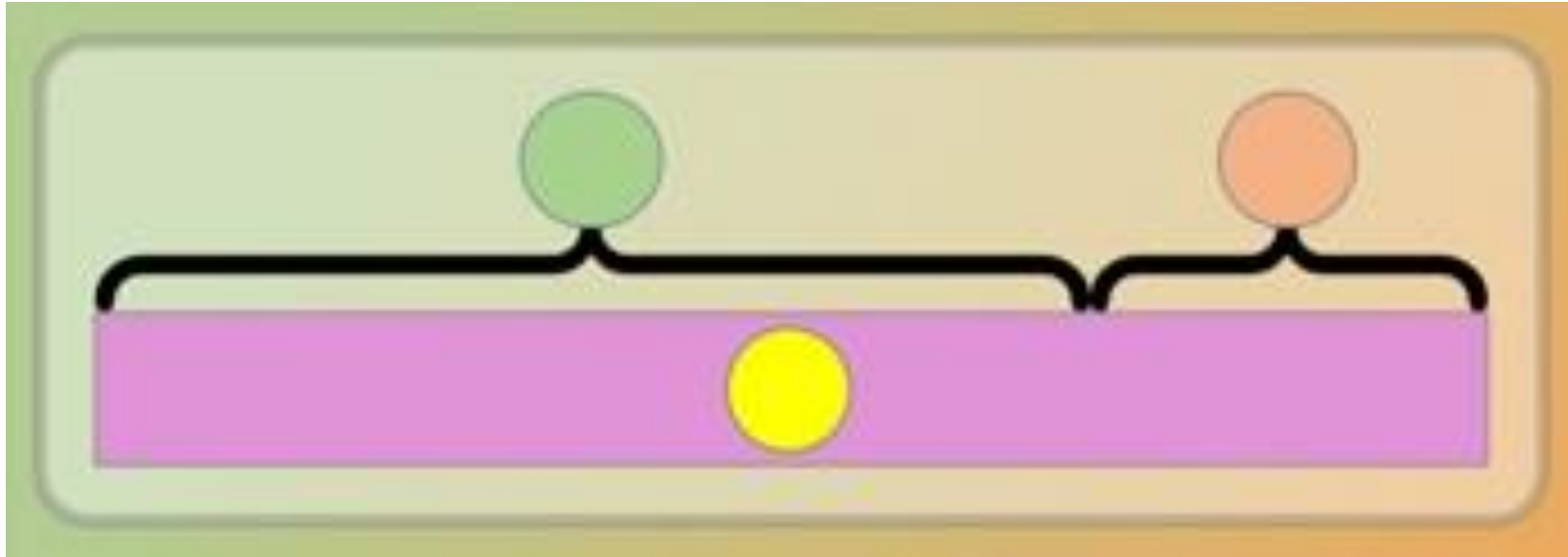
- To share questions
- To share teaching materials
- To share reflections

All schools can access FREE materials.

Username: SYMH

Password: password

Using Bar logik



Got an account? Login here!

Email or Username

Password

LOG IN

[Forgotten your password?](#)

Don't have an account?

REGISTER NOW

You will need a registration code from your school.

Try our Maths tool for free!

BARLOGIK DEMO

Have questions? Contact us: info@westudysmart.com

Note: Internet Explorer is not supported. For best experience, use either Google Chrome or Mozilla Firefox

westudysmart login username: DemoUser

password: smartpasswordmaths

Hypothesis

- By using Bar Logik and Proportional Logik learners will become more familiar with the bar model structure and mentally solving unknowns.

Next steps

- Gather more schools reflections
- Develop and share wider variety of questions
- Assess impact on teachers & learners

- Develop materials & recommendations for schools

Materials

- A4 sheet with
- 4 exemplar questions
- Maths bee questions -