

Welcome

Introduce yourself to your table team

Share your favorite number and why, with your table team.



Welcome & Introductions



Saturday Math: Elementary to Middle

A closer look at algebraic reasoning through the grades.

Norms

- We take care of our own needs while recognizing our responsibility to the group.
- We listen with the intent to understand; we speak with the intent to contribute.
- We treat disagreement as a positive opportunity for learning.
- We are respectful and mindful of our own and others' strengths, challenges, and learning styles.
- We promote a collaborative, generative, and reflective environment.

Collaborative Problem Solving

$$\begin{array}{rcl} \star + \blacksquare + \blacksquare & = & 11 \\ \star + \star + \star + \blacksquare & = & 18 \\ \star + \star + \blacksquare & = & 13 \end{array}$$

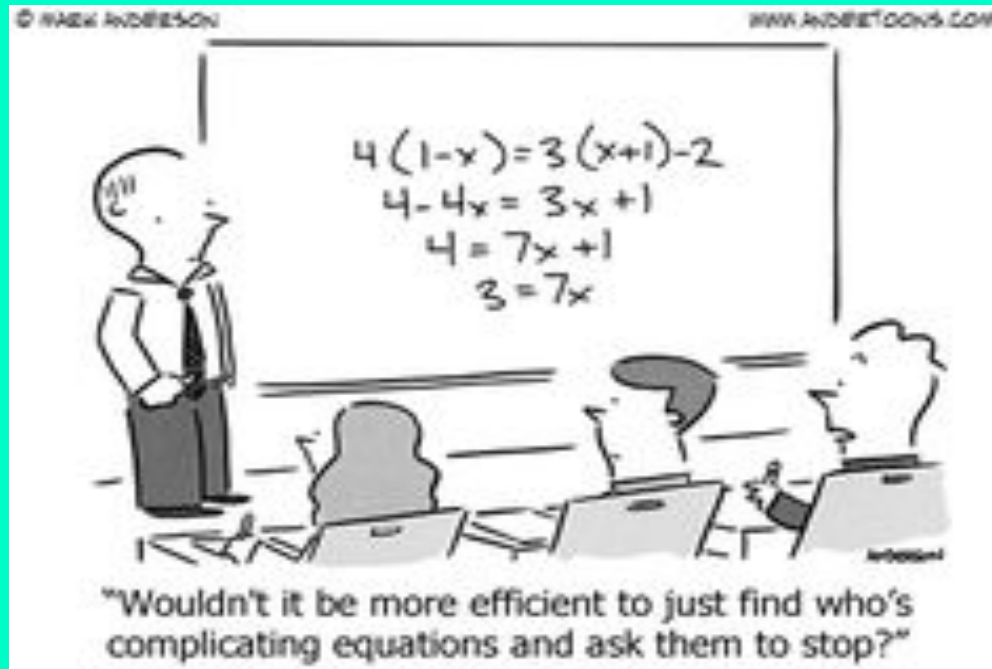
$$\begin{array}{rcl} \blacksquare & = & ? \\ \star & = & ? \end{array}$$

Focus Questions of the Day

How do we build algebraic reasoning by exploring equality?



What is Algebraic reasoning?



Algebraic Reasoning Through the Grades

We will **Explore the Mathematics** of some rich tasks from K-8.

Examine the **connections** between the explicit and underlying mathematical concepts from each task.



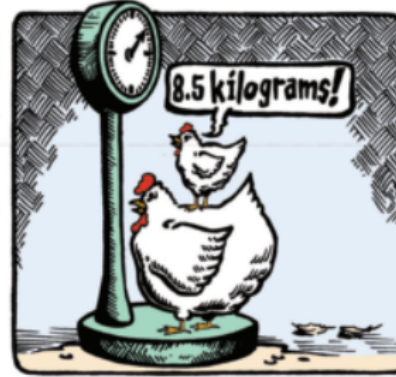
Chicken Problem



I ♥ Chickens

What a Big Dinner!

Chicken Problem



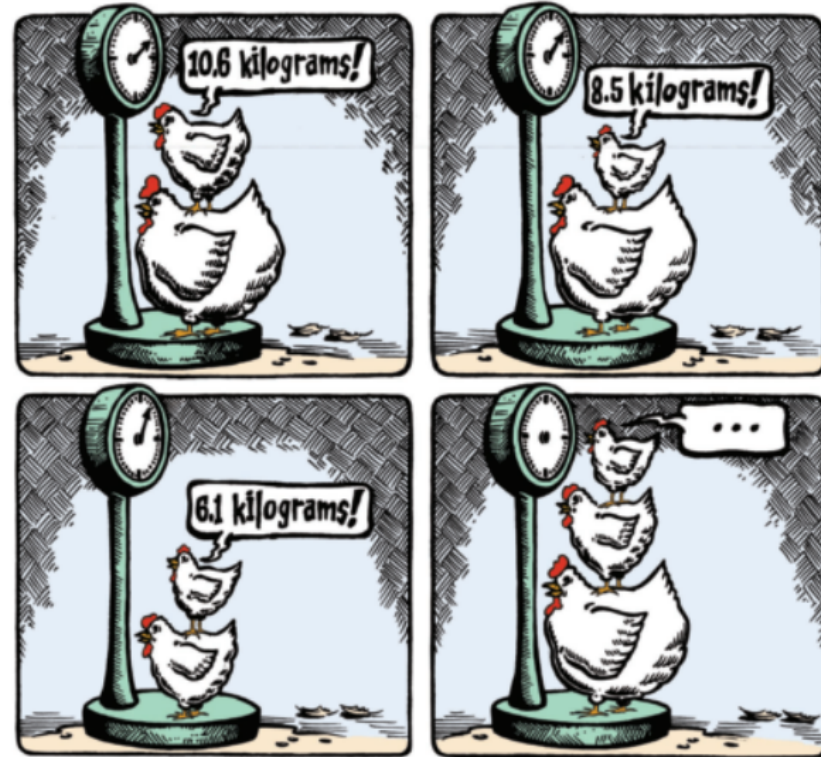
Grade Band Thinking

Grade Bands:

K-2

3-5

6-8 & High School



Grade Band Thinking

If you are in a **younger grade** - what do you do that builds the foundation for this type of problem?

If you are in an **older grade** - what types of problems does this develop into?

Be ready to share out some ideas that you may have.

**True Or
Not True?**

$$10 = 5 + 5$$

$$23 + 10 = 10 + 24$$

$$20 + 3 + 10 = 10 + 23$$

$$64 + 289 + 11 = 65 + 290 + 9$$

$$\frac{2}{3} \text{ of } 12 = \frac{1}{3} \text{ of } 6 + 4$$

Number Balance

$$10 + 5 = \underline{\quad} + 8$$



Instructional Routine



Contemplate then Calculate

An Instructional Routine
Prompting Structural Thinking (MP7)
Experience and Reflect



New Visions
for Public Schools



Contemplate then Calculate



WHAT: Practice looking for *shortcuts* using what you know about the way mobiles and numbers work.

WHY: to “think like mathematicians”,
to find shortcuts using
mathematical *structure*.



Contemplate then Calculate



Notice



Find Calculation Shortcut



Share and Study Shortcuts



Reflect on Learning

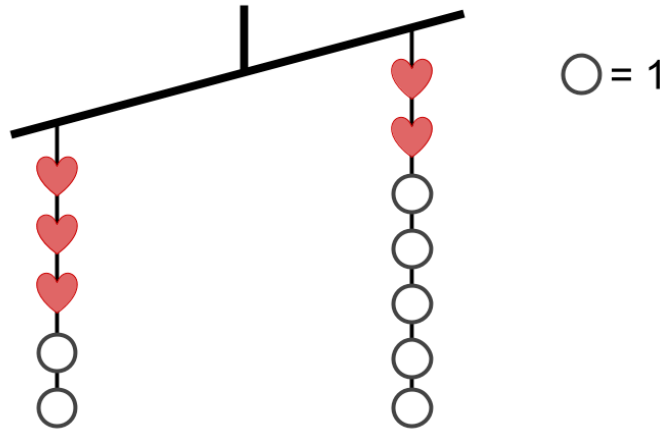


What do you notice?





What do you notice?





What do you notice?





Share



I noticed...

What did you notice?

Find Calculation Shortcut

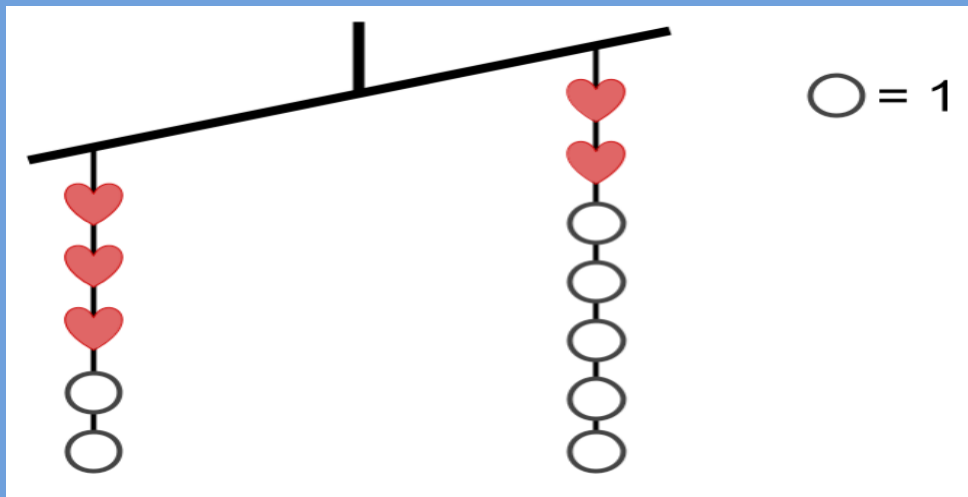
“In your head”



find the value quickly with the fewest calculations

Explain *why* your shortcut works.

Find Calculation Shortcut



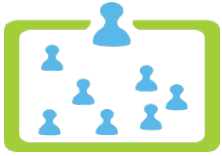
Find the possible values of .

“In your head”

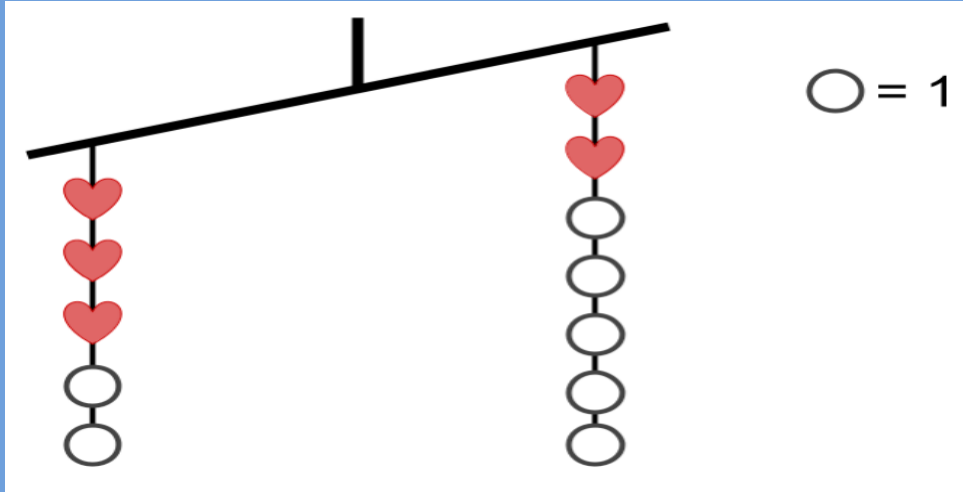


find the values
quickly with the
fewest
calculations

Explain *why* your
shortcut works.



Share and Study Shortcuts



Find the possible values of .

Presenter

We noticed... so we...

We knew... so we...

Our shortcut works because...

Audience

They noticed... so they...

They knew... so they...

Their shortcut works because...



Reflect on Learning

- **Paying attention to ...
is helpful because ...**
- **You can find calculation
shortcuts by ...**

Reflection & Closing

Reflection form

One Word that describes your learning experience of the morning.

