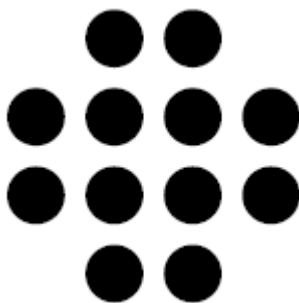


Learning Targets: I can show my multiplicative thinking in pictures, numbers and words. (For teacher review, check out *the progression of multiplication*, from the *Making Sense Series* <https://vimeo.com/149428217>)

- using flexible computation strategies (e.g., decomposing, distributive principle, commutative principle, repeated addition, repeated subtraction)
- using multiplication and division in real-life contexts and problem-based situations
- whole-class number talks

Dot Card Number Talk: Invite students to look at the dot card and, without counting one by one, figure out how many dots there are. (Reminder to students to have their fists in a discreet position and put up a thumb when they think they know how many dots there are). Then, show the dot card. When most thumbs are up, invite willing students to share how many dots they see. Gather several answers on the board. Next, invite students to describe how they saw it. Consider how best to record each way of seeing. Paraphrase student responses, ask questions to clarify, and record students' thinking in pictures and numbers. (*from p.14-15 in Making Number Talks Matter, Humphreys and Parker, 2015*)



Number Talk: 5×25

Invite students to look at the equation, and without pencil and paper, figure out the answer. (Reminder to students to have their fists in a discreet position and put up a thumb when they think they know the answer). When most thumbs are up, invite willing students to share their answers. Gather several answers on the board. Next, invite students to describe how they solved it. Consider how best to record each way of seeing and solving. Paraphrase student responses, ask questions to clarify, and record students' thinking in pictures and numbers.

A Three Act Task: Krispy Kreme Me

<https://gfletchy.com/krispy-kreme-me/>

Connecting: What is that word *array*? What does it mean?

ACT ONE: Show the photographs of the Krispy Kreme Box. As a whole group, invite students to think about and share what they notice in the photographs and what they wonder. Record their ideas on an anchor chart. For example, do you notice how deep the box is?

What do you notice?	What do you wonder?
<ul style="list-style-type: none"> ▪ Have students notice the math in Act One image ▪ Record student responses 	<ul style="list-style-type: none"> ▪ How many donuts are in that big box? ▪ What are the dimensions of the box? ▪ Is there more than one layer of donuts in the box? ▪ How many rows of donuts are there? ▪ How big is (What is the diameter of) a Krispy Kreme donut? ▪ When I was finished (or thought I was finished) wondering, I began to seek the information needed to answer my questions. <p style="text-align: right;"><i>Wonderings of a mathematician: Mike Weirneki</i></p>

How many donuts are in the box? Any suggestions? (Discuss the difference between an observation and an estimation). Invite students to estimate how many donuts are in the box and come up with a *too low estimate* and a *too high estimate*. **An estimate is a wonder!** Students write their estimates on two different coloured post-its and walk them to the chalkboard. Teacher arranges the post-its in an array.

A too low estimate:	A too high estimate:
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Scanning the estimates, collectively identify the range - the lowest estimate in the class and the highest of the estimates in the class.

Next, invite students to think about and share information they believe would be useful to know for solving this problem, and how to get that information. Record ideas shared.

Arrange Random Groupings - model using an array to randomly sort students into groups of three.

1			
2			
3			
4			
5			
6			
7			
8			

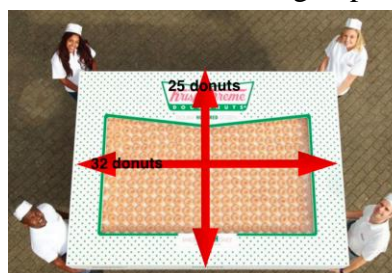
From: HayleyHutchison
07/10/2014 13:21:36

Hi Graham,
We hope the information below helps:
The box was created to allow 3 x layers of [redacted] doughnuts [redacted] x [redacted] doughnuts on each layer)
Each doughnut is approximately 89 millimetres in diameter.
The box is 3000 mm x 2300 mm which allows a gap between each doughnut to sit comfortably.
We do not have any schematics to share as they are for internal use only but we wish you all the best with your class.
Kind regards,
Krispy Kreme

ACT TWO: Share the email from Krispy Kreme in the UK, and invite students to consider the information offered. (this version is metric)

In random groups of three, using the vertical nonpermanent surfaces, invite students to figure out how many Krispy Kreme donuts are in the giant box. Students are encouraged to show their thinking in pictures, numbers and words.

Only if absolutely necessary, share the photo that shows the donuts in rows and columns per layer (32X25)



number of

ACT THREE:

Bring the groups back together to share and reflect on their collaboration. What worked (What strategy did you use to work toward a solution)? What was difficult? What would you do differently next time?

Share the last email that tells how many donuts there were per layer in the box.

From: HayleyHutchison
07/10/2014 13:21:36

Hi Graham,
We hope the information below helps:
The box was created to allow 3 x layers of 800 doughnuts (25 x 32 doughnuts on each layer)
Each doughnut is approximately 89 millimetres in diameter.
The box is 3000 mm x 2300 mm which allows a gap between each doughnut to sit comfortably.
We do not have any schematics to share as they are for internal use only but we wish you all the best with your class.
Kind regards,
Krispy Kreme

Closure: Refer back to Number Talk dot card and invite students to consider “If this were a full array, how many dots would it have? What would it look like?”