How many Cupcakes?

Big Idea:

- Development of computational fluency and multiplicative thinking requires analysis of patterns and relations in multiplication and division.

Curricular competencies:

- **Reasoning and analyzing**
  - Estimate reasonably
  - Develop mental math strategies and abilities to make sense of quantities
  - Model mathematics in contextualized experiences
- **Understanding and solving**
  - Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
  - Develop and use multiple strategies to engage in problem solving
- **Communicating and representing**
  - Communicate mathematical thinking in many ways
  - Use mathematical vocabulary and language to contribute to mathematical discussions
  - Explain and justify mathematical ideas and decisions
  - Represent mathematical ideas in concrete, pictorial, and symbolic forms
- **Connecting and reflecting**
  - Reflect on mathematical thinking

Curricular content:

- multiplication and division of two- or three-digit numbers by one-digit numbers

SWBAT:

- Multiply two-digit numbers by one-digit numbers.

Success criteria:

- Break two-digit numbers into tens and ones
- Use the window method to multiply.

Images

Image 1

(Tranche, n.d.)

Image 2

(Tranche, n.d.)

Lesson Part	Activity	Materials
Introduction	• Number of the day – 108 (McCoy, Barentt, & Combs, 2013) • Students model and describe the number of the day in as many ways as possible • Share answers on smart board	• Quick images • Smart board • Computer
Warm up	• Show students a standard muffin / cupcake pan • How many would fit here? • How do you know? • When have you used / seen this before? • How could we describe this mathematically?	• Muffin tin • Smart board
Setting the stage for a task.	• Miss Younger is in charge of cupcakes for today's staff meeting. She made and decorated a bunch of cupcakes but isn't sure how many she has and if she has enough. She needs at least 54 cupcakes, does she have enough?	•
act 1	• Show students the large cupcake array (images 1) • Students write down observations on white boards • Think – pair -share with elbow buddy each pair shares one observation with class • Students write down questions on white board • Think – pair – share with elbow buddy each pair to share one question • Hand out sticky notes • On your sticky write down in pen your best estimate / guess for how many, put it in the corner of your desk and don't touch it. We'll get back to it later. • Share estimates – chart on board / chart paper • Which do we think is closest? Why? • Which do we think is furthest? Why?	• Image 1 • Smart board • Student white boards • Sticky notes • Pens • Chart paper • Chart pens

Lesson Part	Activity	Materials
Act 2	• What information do we have? • What information do we need? • Show image 2 • What is this image showing? • How does this image connect to image 1? • What new information do we have? • What new questions do we have? • Display the two images side by side • What do you notice about these two images? • How could that help us? • You have all on the information you need, work with your partner to come up with a solution.	• Student white boards • Smart board • Chart paper • Chart pens
Act 3	• Work with partner to solve problem • May use any tool in classroom • Write down final solution in a different colour form estimate on sticky note • As a class solve together. • Have pairs share their strategies to getting to the final answer • Should have 108 as the final answer • Does Miss Younger have enough cupcakes? How do you know?	• Smart board • Images
Discussion	• What questions did we answer? • What new questions do you have? • How did our questions help us solve the problem? • What made you curious about this problem? • What went well? • What was challenging?	• Smart board • Images

Lesson Part	Activity	Materials

3 act response	• In student math note books
	  ○ Describe the big image (give students printed copies)
	  ○ Write a problem to describe the image
	  ○ Write three clues to help someone solve the problem
	  ○ What was your initial guess?
	  ○ How close was your guess to the correct answer?
		• Math note books

Teacher lead	• Previous activity we found ways to multiply two digit by one-digit numbers (18x6)
	• List ways we did it
	  ○ Repeated addition
	  ○ Arrays
	  ○ Equal groups
	• There's a faster way
	• Teach window method (see below) with problem from 3 act task
	• Solve 2 or three samples together
		• Smart board

Pair work	• Give pairs a question to solve using window multiplication together	• White boards • Smart board

Independent work	• Students complete work sheet
	• Adaptations
	  ○ Selected questions
	  ○ 1 by 1 digit for specific student
	  ○ Use manipulatives
		• Work sheets

Extensions	• Create your own on your desk using any object / manipulative in the room. • Take a picture with an iPad • Upload to Teams for other students to solve	• Ipads • Student choice of manipulatives

Window multiplication

x	10	8
6	60	48

60 +48 = 108

Assessment

This is a formative assessment to check in to see if students are understanding how to use the window model. Worksheets would be collected checked. One or two problems may be selected for my favourite no activity.

Bibliography

BC Ministry of Education. (2020). *Grade 4 Math Curriculum*. Retrieved from Building Student Success: https://curriculum.gov.bc.ca/curriculum/mathematics/4/core

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