

M2C3 Math Modeling Lesson Overview

LESSON TITLE: Sharing Snacks – Strawberries

Standards Alignment

| GRADE 3 | GRADE 4 | GRADE 5 |
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| <p>3.OA.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.</p> <p>3.OA.B.5 Apply properties of operations as strategies to multiply and divide.</p> <p>3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations.</p> | <p>4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p> <p>4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5.</p> <p>4.OA.A3. Solve multistep word problems posed with whole numbers and having whole number answers using the four operations, including problems in which remainders must be interpreted.</p> <p>4.OA.C.6 Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p> | <p>5.OA.1 and 5.OA.2 Write and interpret numerical expressions.</p> <p>5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.</p> <p>5.NBT.B.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays and/or area models.</p> |
| <p>MP: 1 Make sense of problems and persevere in solving them.</p> <p>MP: 4 Model with Mathematics</p> | <p>MP: 1 Make sense of problems and persevere in solving them.</p> <p>MP: 4 Model with Mathematics</p> | <p>MP: 1 Make sense of problems and persevere in solving them.</p> <p>MP: 4 Model with Mathematics</p> |

CONNECTIONS (Consider while planning):

• Previous Math Knowledge: *What prior math knowledge and experiences does this lesson consider and/or build on?*

Four operations (addition, subtraction, multiplication and division) using numbers between 0-1000. Representing math ideas with pictures, symbols, and words.

• Cultural/Community/Family Connections: *How does the lesson connect to, or build on the knowledge, practices, or experiences of children and families? On community contexts??* Sharing food and other items among siblings, friends, classmates. Fair sharing. Snack time rituals. Serving sizes. Label reading.

• Language Considerations: *How does this lesson connect and distinguish between everyday*

language and math language? What might be specialized vocabulary used in this lesson? Connections to home language? Rate language may arise (e.g., 3 Strawberries **per** person; 2 day)

TASK VARIATIONS: Sharing Strawberries

Level 1: Routine: Mathematizing World - Open Ended (10 minute) - [Show Slide 2 - Video]

- What do you notice? What does this picture make you wonder about? Brief class discussion.
- What questions do you have? What would you need to do to answer those questions?

Level 2: Routine: Mathematizing World - Specific Questions (20 minute) Sensemaking and assumption building [Show image 4 bins of strawberries and elicit and/or pose specific questions that can be answered using mathematics; consider using anchor chart to record “math” questions using questions stems - How much? How many? How much more/less; How big/small?]:

- Look at this large container of strawberries... (use realia or slide – students should estimate how many strawberries on top and how many deep)
- What questions do you have that you could use mathematics to answer?
- What information do you need to find out how many strawberries each person gets?
- How will you use this information to figure out a fair way to share the strawberries?

Level 3: Full Modeling Task (60-90 minute) Students participate in entire modeling cycle

On Monday, your class will get 4 large containers of strawberries to share for snack time. You have snack every day, and you want the strawberries to last the whole week. What can you do to make sure they last all week? How can you figure out how many to give to each student? Make a plan to share the strawberries in a fair way over the week. You can use pictures, numbers and words in your plan.

Your plan to share the strawberries must show:

- That the snack lasts for a week
- it is a fair plan
- your assumptions
- you can use the plan in other sharing situations

Sentence stems to help students communicate their plan:

- The plan shows the strawberries will last for the rest of the week by...
- My plan is fair because...
- This plan could work in a similar situation because...
- I could use this plan for other situations such as ...

POSSIBLE ASSUMPTIONS

Number of students who will be at school each day

All students will come to school each day; OR, some students will be absent

The “rest of the week” includes 3 days (Wednesday, Thursday, and Friday)

Not everyone will want the snack; some students may have dietary restrictions

Only students will eat the snack; not adults; OR, Everyone will eat the snacks

There are about the same number of strawberries in each container.

The strawberries are the same size. Or If we give a someone a very big strawberry they will be fewer berries altogether.

We want to get the same amount each day; OR, we want more snack on a particular day.

Students who are familiar with fresh berries may say that some of the berries will “go bad” and we need to lower the amount we can use as the week goes on.

ANTICIPATED STUDENT STRATEGIES (Examples for Strawberry Snack Task):

Students might:

Estimate or calculate the number of strawberries in the large container by counting the number in the top row (say 33) and multiplying that by 2. $33 \text{ berries} \times 2 \text{ rows of berries} = 66 \text{ berries/container}$.

Estimate the number of strawberries in the container by counting the number across one row (7) and how many on the other side (5), then estimating $7 \times 5 = 35$ on each layer. It there are two layers of strawberries that is $70 / \text{container}$.

$66 \text{ strawberries} / \text{container} \times 4 \text{ containers} = 264 \text{ strawberries all together}$.

$264/3 \text{ days} = 88 \text{ strawberries for snack each day}$

$23 \text{ students} + 2 \text{ teachers} = 25 \text{ people to serve}$.

$88/25 = 3 \text{ strawberries} + 13 \text{ left over}$.

On the last day give everyone 4 strawberries.

If someone gets a small strawberry, then give them an extra small strawberry.

Rather than estimate the total. On day 1 (Wednesday) divide the strawberries from one package among the class. Say 2 strawberries for each person. $= 50 \text{ strawberries}$. Take the remaining strawberries and cut them in half. $16 \times 2 = 32 \text{ halves}$. Give a half strawberry to each person. Then give the leftover halves to those that got the smallest strawberries. Possible error is that students will say $\frac{1}{2}$ of $16 = 8 \text{ strawberries}$ instead of seeing that cutting 16 strawberries in halves make 32 halves.

Do this the next day and on the last day split the two remaining containers.

$66+66 = 132$ $132/25 = 5 \text{ strawberries with } 7 \text{ left over}$.

MATERIALS

Snack Sharing_Strawberries_Lesson Overview

Snack Sharing_Strawberries_Student Task

Snack Sharing_Strawberries_Lesson Slides

Relia – Large container of Strawberries or large picture of the container - optional