M2C3 Math Modeling Lesson Overview

LESSON TITLE: Sharing Snacks – Animal Crackers

Standards Alignment

GRADE 3	GRADE 4	GRADE 5
3.0A 3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. **3.OA.B.5** Apply properties of operations as strategies to multiply and divide. **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 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations.	**4.NBT.B.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm. **4.0A.1** Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. **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. **4.OA.C.6** Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	**5.OA.1 and 5.OA.2** Write and interpret numerical expressions. **5.NBT.B.5** Fluently multiply multi-digit whole numbers using the standard algorithm. **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. **5.NBT.B.7** Add, subtract, multiply and divide decimals to hundredths…
MP: 1 Make sense of problems and persevere in solving them. **MP: 4** Model with Mathematics	**MP: 1** Make sense of problems and persevere in solving them. **MP: 4** Model with Mathematics	**MP: 1** Make sense of problems and persevere in solving them. **MP: 4** Model with Mathematics

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 Animal Crackers **per** person; 2 crackers **per** person, **per** day)

National Animal Cracker Day: April 18th
https://nationaldaycalendar.com/days-2/national-animal-crackers-day-april-18/

TASK VARIATIONS: **Sharing Animal Crackers**

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

- 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 of giant animal cracker container 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 big container of Animal Crackers… (use realia or slide)
- What questions do you have that you could use mathematics to answer?
- What information do you need to find out how many Animal Crackers each person gets?
- How will you use this information to figure out a fair way to share the Animal Crackers?

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

On Monday, your class gets a giant container of Animal Crackers to share for snack time. You have snack every day, and you want the Animal Crackers 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 Animal Crackers in a fair way over the week. You can use pictures, numbers and words in your plan.

Your plan to share the Animal Crackers 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 animal crackers last for a 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

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

Some other number of animal crackers (ex: 10) is a reasonable serving size even if the nutritional label says 11.

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

ANTICIPATED STUDENT STRATEGIES (Examples for Animal Cracker Snack Task):

Students might:

Estimate or calculate the number of Animal Crackers in the giant container (e.g., using number of servings and serving size information on the nutrition label). Ex: 11 crackers/serving x 65 servings/ container = 715 crackers/container.

Use 11 crackers/serving and assume the container holds 65 servings. If they needed to serve 25 students every day students might find that one container of crackers would cover servings for two days with some crackers left over.

They might decide that they should make a container last one week.

They could determine a *reasonable* serving size for each student if they think the nutritional label serving size is too small or too large. If we gave everyone 8 crackers/serving instead of 11 -.> 715/8 = 89.375 serving. Round to 89 servings / container.

Students will need to think about what a "week" means in the school context (5 days or 7 days). The phrase, "you have snack everyday" leaves open the possibility of more than once a day. Determine the number of students receiving snack (taking into consideration things like absences, dietary restrictions, and whether little kids and big kids eat the same amount). Using these criteria, they might estimate 20 servings/day instead of 25.

20 servings / day x 8 crackers/serving = 160 crackers/ day.

(715 crackers/ container)/(160 crackers served /day) = 4.47 servings. Depending on their grade level this could use this number or round down to 4. Students with experience multiplying and dividing decimal numbers could be more precise. 4 days and (0.47 X 160) left over. This could be thought of as 4.5 days. They might explore giving every student 7 crackers to see if they could get a week's worth of crackers from one container.

They could give 6 crackers on Monday Wednesday and Friday and 8 crackers on Tuesday and Thursdays. 6 x 20 x3 + 8 x 20 x2 = 580 crackers   715-580=135 crackers left over per week if we have one container/week.

MATERIALS

Snack Sharing_Animal Crackers_Lesson Overview
Snack Sharing_Animal Crackers_Student Task
Snack Sharing_Animal Crackers_Lesson Slides
Relia – Large container of Animal Crackers - optional