M2C3 LESSON PLAN OVERVIEW

LESSON TITLE: Pizza Party

STANDARDS ALIGNMENT:

GRADE 3	GRADE 4	GRADE 5
3.OA: Represent and solve problems involving multiplication and division. 3.OA 3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. 3.G 2: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. 3.NF 3d: Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole.	4.OA.1 Use the four operations with whole numbers to solve problems. 4.OA.3 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...Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 4.NF 3: Understanding a fraction a/b with a>1 as a sum of fractions 1/b 4.NF 2: Compare two fractions with different numerators and different denominators… Recognize that comparisons are valid only when the two fractions refer to the same whole. 4.NF 4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	5.OA.1-2 Write and interpret numerical expressions. 5.NBT.5 Perform operations with multi-digit whole numbers and with decimals to hundredths. 5.NF 4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
MP: 1 Make sense of problem and persevere in solving them. MP: 2 Reason abstractly and quantitatively. MP: 3 Construct a viable argument and critique the reasoning of others. MP: 4 Model with mathematics	MP: 1 Make sense of problem and persevere in solving them. MP: 2 Reason abstractly and quantitatively. MP: 3 Construct a viable argument and critique the reasoning of others. MP: 4 Model with mathematics.	MP: 1 Make sense of problem and persevere in solving them. MP: 2 Reason abstractly and quantitatively. MP: 3 Construct a viable argument and critique the reasoning of others. 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.
Estimating quantities, partitioning shapes into equal parts,
Knowledge about fractions

• 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??*

Attending birthday or family parties, assisting adults or other family members in organizing birthday or family parties, or planning one themselves. Considering how much food to order to serve a given number of people.

• 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?*

Language related to serving size: e.g., 2 slices per person

Language related to ratios of people to pizzas: e.g., 1 pizza for every 3 people

TASK Variations (to numbers, contexts, structure):

Routine 1: Mathematizing World - Open Ended (10 minute) - [Show video of kids having a pizza party, or image related to a pizza party- see ppt file with possible images]

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

Routine 2: Routine: Mathematizing World - Specific Questions (20 minute) Sensemaking and assumption building [Show image related to kids having a pizza party 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?]:

- What mathematical questions can you ask? Or What questions do you have that you can use mathematics to answer?
- How many pizzas do you think there are? How many slices would that be?
- How big is that pizza? How big is each piece?

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

VERSION A/WARM-UP TASK: Pizza for students at ONE table

The kids at your table are going to have a pizza party. How many pizzas do you need? Remember you want enough pizza, but not a lot of extra pizza.
Or
If a pizza has 8 slices, figure out how many pizzas you would need for the people at your table. Remember you want enough pizza, but not a lot of extra pizza.

Questions to think about:
- What do you know?
- What do you need to find out?
- What do you need to *assume*?

Make a plan for how many pizzas to order.

- Use pictures, numbers, and words

- Show the number of slices of pizza each person can eat, and how many pizzas you will order
- Show you will have enough pizza, but not a lot of extra

VERSION B/MAIN TASK: Pizza party for your whole class

Your class decides to have pizza party. How many pizzas should you order?

Questions to think about:
- What do you know?
- What do you need to find out?
- What do you need to *assume*?

Make a plan for how many pizzas to order.

- Use pictures, numbers, and words
- Show the number of slices of pizza each person can eat, and how many pizzas you will order
- Show you will have enough pizza, but not a lot of extra

VERSION C/EXTENSION TASK: Pizza party for Families

What if families are invited to our class pizza party, how many pizzas do we need to order? Remember that you want to have enough pizza, but not a lot of extra
Your friend says that you will have to order 20 pizzas.
Do you agree with your friend? What would make your friend's statement reasonable?

Explain whether you agree or disagree that you will need 20 pizzas for the class and family pizza party.
- Use pictures, numbers, and words
- Explain whether 20 pizzas is or is not a reasonable number of pizzas to order

VERSION D/EXTENSION TASK: Pizza party for Grade Level

What if the pizza party is for the entire $3^{rd}/4^{th}/5^{th}$ grade, then how many pizzas do we need to order?

Make a plan for how many pizzas to order.

- Use pictures, numbers, and words
- Show the number of slices of pizza each person can eat, and how many pizzas you will order
- Show you will have enough pizza, but not a lot of extra

ANTICIPATED STUDENT STRATEGIES:

Version 1

Students might count the number of people on their table.

They might want to know how big the pizza is and how many slices it has or how big each slice is. They might want to make paper pizzas of different sizes and fold them into fractional parts to determine the size. They should recognize that comparisons are valid only when two fractions refer to the same whole. (3.NF: 3d. and 4.NF:2)

After agreeing upon some pizza size and the size of each slice, they could either assume that each of student gets the same number of slices or take into consideration the fact that individual students might want to eat a different amount of pizza and so discuss how many slices each person wants.

For ex:

Person A wants 2 slices, person B wants 3 slices, person C wants 2 slices –

They might decide to add all the numbers, i.e. 7 and decide that they want at least 7 slices in total

Or they might go with 2 slices for each because majority of them wants 2 and use this to calculate the total number of slices they would need for all the students at their table by multiplying 2 with the number of students at the table.

Or they might decide to use the average number of slices for how many slices each of them gets. Students may not be familiar with average, but some may know the concept and propose it. Depending on the grade level, a formal or informal discussion could ensue. If so, they could use this average to calculate the total number of slices by multiplying the average with total number of people.

Or they might decide to use some number in between the range of choices given for the number of slices. In this example it could be either 2 or 3 as I don't think they would use a decimal number. And multiply which ever number they choose with the total number of students at the table to find out the total number of slices they would need.

They might use the total number of slices they come up with to decide how many pizzas they want to order based on the pizza size they already considered.

Materials:

Model pizza or pictures of pizzas.

Paper circles the size of pizzas for exploring slice sizes

Sharing Pizza_Student Task sheets

Sharing Pizza_Lesson Slides