| **TEAM Lesson Plan Template** | |
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| Teacher: Dr. Amanda Niedzialomski | |
| Subject/Grade: Mathematics (Fractions) / 3rd - 4th Grades | |
| Lesson Title: Pizza Party! | |
| **STANDARDS** | **Identify what you intend to teach.** State, Common Core, ACT College Readiness Standards and/or State Competencies; Enduring Understandings and Essential Questions. |
| **MP2. Reason abstractly and quantitatively**  **MP3. Construct viable arguments and critique the reasoning of others**  **MP5. Use appropriate tools strategically**  **MP6. Attend to precision**  **MP7. Look for and make use of structure**  [Parts of this activity are appropriate for each of the following standards. Emphasize those parts and omit other parts as necessary to adapt the activity for a particular group of students.]  **3.NF.A.1** Understand a unit fraction, 1/b, as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a non-unit fraction, n/b, as the quantity formed by n parts of size 1/b. For example, 3/4 represents a quantity formed by 3 parts of size 1/4.  **3.NF.A.3** Explain equivalence of fractions and compare fractions by reasoning about their size.  a. Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line.  b. Recognize and generate simple equivalent fractions (e.g., 1/2 = 2/4, 4/6 = 2/3) and explain why the fractions are equivalent using a visual fraction model.  c. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. For example, express 3 in the form 3 = 3/1; recognize that 6/1= 6; locate 4/4 and 1 at the same point on a number line diagram.  d. 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. Use the symbols >, =, or < to show the relationship and justify the conclusions.  **4.NF.A.2** Compare two fractions with different numerators and different denominators by creating common denominators or common numerators or by comparing to a benchmark such as 0 or 1/2 or 1. Recognize that comparisons are valid only when the two fractions refer to the same whole. Use the symbols >, =, or < to show the relationship and justify the conclusions. | |
| **OBJECTIVE(s)/Sub-Objectives** | **Connect prior learning to new learning.** Clear, Specific, Observable, Demanding, High Quality, Measurable, Aligned to Standard(s), and Integrated with other subjects, build on prior student knowledge  Student-Friendly (I Can Statement) |
| I can represent a unit fraction as a portion of a circle.  I can use a fraction ruler to find equivalent fractions.  I can math a mathematical comparison statement about two fractions using >, =, or <. | |
| **MATERIALS AND RESOURCES** | **Content-related:** Clearly supports lesson objective(s); rigorous & relevant; Incorporates multimedia & resources beyond the textbook. |
| **Materials**  Pizza Printouts (with a variety of slice sizes)  Pizza Party Worksheets  Circle Fraction Rulers  Crayons  Scissors  **What if the technology is not working?** This is a low-tech activity, with the exception of the video in the hook. If the video is not working, ask the students: *Does anyone know the Teenage Mutant Ninja Turtles? Do you know their names? And Michelangelo – do you know what his favorite food is? Pizza!*  **Routine for distributing materials:** After the hook, pizza printouts and pizza party worksheets are passed out to each student. The pizza printout with 3 slices is reserved for teacher demonstration. The other pizza printouts have a variety of slice sizes (from 4 slices to 12 slices); these are shuffled and passed out randomly. The scissors, circle rulers, and crayons (if using) are placed at several locations around the room to be accessible to all students. | |
| **ACCOMMODATIONS/ADAPTATIONS** | **Learning styles and interests.** Anticipate learning difficulties, regularly incorporate student interests & cultural heritage; differentiate instructional methods. |
| **Modifications/Plans for Diverse Learners**  **Differentiation**  **\_\_x\_\_ Content:** Some students may benefit from concentrating on producing the mathematical comparison statements about fractions, without also justifying them. Other students can justify the comparison statements by drawing the corresponding circle diagrams, rather than justifying by finding a common denominator. Some students may benefit from limiting the types of circle rulers to those with either a common numerator or common denominator to their pizza slice.  **\_\_x\_\_ Process:** Some students may be able to make comparison statements about numerical fractions without using the circle rulers. Other students may prefer to cut up a printed circle ruler to make comparisons, rather than use the laminated circle rulers.  **Accommodations**  **\_\_\_ Preferential Seating \_\_\_ Extended Time \_\_\_ Small Group \_\_\_ Peer Tutoring**  **\_\_\_ Modified Assignments \_\_\_ Other**  **Early Finishers:** Early finishers can get a pizza printout with a different number of slices and make more comparisons. | |

| **MOTIVATING STUDENTS/ANTICIPATORY SET** | **“Hook”: Engage students’ attention and focus on learning.** Personally meaningful and relevant. |
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| Watch a video about how much Michelangelo of the Teenage Mutant Ninja Turtles loves pizza:  [Teenage Mutant Ninja Turtles | National Pizza Day: Michelangelo’s Pizza Shop | Nick](https://youtu.be/CimAXDTeD6Q)  https://youtu.be/CimAXDTeD6Q | |
| **INSTRUCTIONAL PROCEDURES** | **Step-by-Step Procedures-Lesson Sequence: Basic to Complex.** Lesson includes visuals, modeling, logical sequencing and segmenting (beginning, middle, ending); essential information; concise communication; grouping strategies; differentiated instructional strategies to provide intervention & extension; seamless routines; varied instructional strategies; key concepts & ideas highlighted regularly. |
| ***Introductio*n** *Today we will be learning about fractions by playing with a turtle’s favorite food. What is a turtle’s favorite food? Show video from hook. Pizza! If you eat one piece of pizza, what fraction of the pizza have you eaten?*  Distribute the pizza printouts and worksheets. Optionally, students can use the crayons to decorate their pizza printouts, either now or at the end of the lesson.  Discuss the unit fraction 1/b as the quantity formed by one part when a whole is partitioned into b equal parts. Students write down the unit fraction represented by one slice of their pizza and draw a corresponding circle diagram with 1/b shaded.  Discuss the non-unit fraction 2/b, as the quantity formed by 2 parts of size 1/b. Students write down the fraction 2/b represented by two slices of their pizza and draw a corresponding diagram with 2/b shaded.  Tell the students that Michelangelo, of the Teenage Mutant Ninja Turtles, is coming over for some pizza. Each student must decide how big of a "slice" of pizza they will cut for Michelangelo. The rules are:  (1) They must give Michelangelo some, not all, of the pizza.  (2) They must cut the pizza into exactly two parts -- one to give to Michelangelo, and one to keep.  (3) They must cut along existing lines in the pizza.  (4) They must cut carefully and accurately so the slices can be measured.  For example, if they have a pizza with lines that divide it into six equal pieces, they could cut a slice of size 1/6, 2/6, 3/6, 4/6, or 5/6. Students record their choice of slice size for Michelangelo on their worksheets.  The teacher demonstrates cutting the pizza with 3 slices into two pieces - one of size 1/3, and one of size 2/3. Now the teacher takes one of the pieces and demonstrates comparing its size to the Circle Fraction Rulers. Lay the slice on top of the ruler and line up one edge of the pizza with one line of the ruler. Does the other edge match with a line too? Then we have equivalence! If not, what is a comparison statement we can make? Match the pizza slice with different Circle Fraction Rulers, and make a list of some conclusions that can be drawn. For example:  2/3 < 1 2/3 > 3/5  2/3 > 1/2 2/3 < 4/5  2/3 > 1/3 2/3 = 4/6  2/3 < 3/3 2/3 > 5/8  2/3 > 2/4 2/3 < 6/8  2/3 < 3/4 2/3 = 8/12  *For the conclusions we found that have either a like numerator or a like denominator, can we explain why these make sense? Why does it make sense that 2/3 > 2/4? Why does it make sense that 2/3 < 3/3?*  Now it's the students' turn. Students take turns comparing their slice for Michelangelo to different Circle Fraction Rulers and recording their findings. Students may also compare their pizza slices with their neighbors to make comparisons. For each of the equality or inequality statements, students can give a numerical justification by finding a common denominator or numerator on the back of their worksheets. (Alternatively, students can justify the statements by drawing the circle diagrams that represent each fraction.) Early finishers can get a pizza printout with a different number of slices and make more comparisons.  When all students have made several comparison statements, regain the attention of the class. Everyone should write their name on the back of their slice of pizza for Michelangelo and carry it with them to the front of the classroom. *We are going to play a little game and move around a bit now!* Students will move to make groups where their pizza slices for Mochelanelo share a characteristic, as stated by the teacher.  *(1) If your slice is less than 1/2 of the pizza, stand here. If your slice is equivalent to 1/2 of the pizza, stand here. If your slice is greater than 1/2 of the pizza, stand here. How can you tell if a fraction is less than 1/2? How can you tell when a fraction is greater than 1/2?*  *(2) Now, if you gave Michelangelo the smallest slice of pizza you could, stand over here. Everybody else over there. What kind of fractions are these? What are they called? (Unit fractions/non-unit fractions)*  *(3) Now, line up from smallest to largest!* List the distinct fractions on the board from smallest to largest, and distinguish equivalent fractions by underlining them. *How can you tell when two fractions are equivalent?*  *(4) Now, find someone else that has the same numerator as you!* For each pair, write a comparison statement on the board. *When fractions have the same numerator, how can we tell which fraction is smaller? Why does that make sense?*  *(5) Find someone that has the same denominator as you!* For each pair, write a comparison statement on the board. *When fractions have the same denominator, how can we tell which fraction is larger? Why does that make sense?*  At the end of the game, turn their slices in (for Michelangelo to pick up). If decorated, these might be hung on the classroom walls as a student work display.  **Motivating Students**  \_x\_ Game: Students play a sorting game at the end of the lesson.  \_x\_ Verbal Reinforcement: The teacher will monitor students’ work throughout the activity to provide reinforcement.  \_x\_ Other: Some students may find the theme fun and the opportunity to be creative by decorating their pizza motivating.  **Presenting Instructional Content**  \_x\_ Hands-On: Students create a physical fraction model.  \_x\_ Work Examples: Students work examples of numerical fraction comparisons to accompany their observations with the fraction models and rulers.  \_x\_ Game: Students play a sorting game at the end of the lesson.  ***Instructional strategies:***  **Modeling and Guided Practice *-*** The teacher will show the pizza fraction model creation process using the pizza printout with 3 slices. The teacher will also show how to use the Circle Fraction Rulers. The teacher will monitor students’ work and ask questions to prompt them if they are stuck.  **Check for Understanding (CFU) –**  ***What am I doing for students that progress at different rates?***  Encourage students to help each other. If students finish early, have work on a pizza printout with a different number of slices.  ***What do I do if they get it?***  Move on to purely numerical fraction comparisons; discuss how to find a common denominator, and why this is beneficial.  ***What do I do if they don’t get it?***  Limit the assignment to making the comparison statements without also justifying them, or justify the comparison statements by drawing the corresponding circle diagrams. Limit the types of circle rulers to those with either a common numerator or common denominator to their pizza slice. | |
| **QUESTIONING/THINKING/PROBLEM SOLVING (embedded throughout)** | **Balanced mix of question types.** Utilizes Blooms Taxonomy/Webb’s Depth of Knowledge; high frequency; purposeful & coherent; require active responses; balance based on volunteers/non-volunteers, ability, & gender; lead to further inquiry & self-directed learning.  **Implement four types of thinking (Analytical, Practical, Creative, & Research-based) & Teach/Reinforce problem-solving types**. Provide opportunities for students to generate ideas & alternatives; analyze, evaluate & explain information from multiple perspectives& viewpoints. |
| **Questioning**  **Knowledge:**  What is a unit fraction?  What is a non-unit fraction?  **Comprehension:**  Is 2/10 a unit fraction?  What fraction does this circle model represent?  **Application:**  Represent 5/6 as a portion of a circle.  If you eat one piece of pizza, what fraction of the pizza have you eaten?  **Analysis:**  Is 2/5 equivalent to 4/10? Explain your reasoning.  Which of these fractions is larger?  **Synthesis:**  If two fractions have the same denominator, how can you tell which fraction is larger?  If two fractions have the same numerator, how can you tell which fraction is smaller?  How can you tell if a fraction is less than 1/2?  How can you tell when two fractions are equivalent?  **Evaluation:**  **Thinking**    \_x\_ **Practical** –Students apply a circle fraction model to the real-life scenario of sharing a pizza.  \_x\_ **Analytical** – Students compare and categorize fractions. Students analyze the numerical comparison statements and use their fraction knowledge to justify them.  \_x\_ **Research-based** – Students explore and produce fraction comparison statements by measuring their pizza slice with different fraction rulers.  **Problem Solving**  **\_\_x\_\_ Categorization:** The end-of-lesson game asks students to categorize fractions in different ways.  **\_\_x\_\_ Drawing conclusions/Justifying Solutions:** Students draw conclusions based on their observations using the fraction rulers, then further justify those observations numerically.  **\_\_x\_\_ Observing and Experimenting:** Students experiment with different fraction rulers to make comparison statements. | |

| **GROUPING** | **Maximize student understanding & learning** Varied group composition (race, gender, ability, & age); clearly understood roles, responsibilities & group work expectations; accountability for group & individual work; student opportunities for goal setting, reflection & evaluation of learning. |
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| * Students work individually, followed by a whole-group game at the end of the lesson. * Product. Students complete the pizza party worksheets and the decorated pizza printouts. | |
| **ASSESSMENT** | **Formative and/or summative assessment.** A variety of assessments, including rubrics, measure achievement of objectives and informs instruction. |
| ***Assessments:***  **\_\_x\_\_ Teacher Made Test:** The activity worksheets can be used for assessment. In a future test, the activity can be reproduced using images of circle diagrams.  **\_\_x\_\_Teacher Observation:** The teacher will directly observe the students’ success during the game.  *\****Students should achieve \_\_\_\_\_% mastery of this objective: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | |
| **CLOSURE** | **Reflection/Wrap Up.** Summarizing, reminding, reflecting, restarting, connecting. |
| ***During the conclusion part of creating an effective lesson plan teachers must sum up the ideas learned from the lesson. A teacher should also relate this information to future and past coursework to provide students with a broad understanding of the ideas learned. It is important to allow students enough time to ask questions, assert assumptions, and summarize the lesson during this part of the lesson plan.***   * ***Review/Summary: wrap up what has been learned and accomplished in the lesson (even if they are in the middle of an exercise, it is still important to summarize to the point where they are now). Ideally involve students in this synthesis.*** * ***Preview for next lesson: link what they did to day with where they are going next.*** * ***Upcoming assignments: remind them of any upcoming assignments.***   ***Today we…. Turn to your partner and…. Let’s review our I Can statements……***  ***Here is your exit ticket for today…..***  **Follow-up Activities/Extension *These may be designed to create a longer or more intense lesson. For example, if the class is able to cover the material in a lesson much faster than expected, extensions may prove helpful. Extensions may also be useful in various parts of a lesson where the teacher (and class) decides they should spend more time on a skill or topic.***  ***Reflection: You must reflect on every lesson you teach.*** | |

**NOTES:**

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