**LESSON PLAN OUTLINE**

1. TITLE OF LESSON: **Parts is Parts**
2. CONTEXT OF LESSON: The class I will be teaching this fall is titled: Developmental Math 6. It will be held 45 minutes daily. It will include 3 students who are labeled as Learning Disabled and/or Orthopedically Impaired. All 3 students have been evaluated in the 5th grade by using the VGLA (Virginia Grade Level Assessment) for Math only. Although these three students passed their VGLAs, they are unable to maintain the speed of the general education curriculum, require the use of multi-modal learning styles, require extensive use of accommodations and modifications, and have difficulty with their working memory. Since these students can no longer be evaluated using the VGLA, our school has created a class that will teach them the Math 6 SOLs at their speed and their level, and prepare them to take the 6th grade Math Plain English SOL Assessment or possibly the VMAST.

In preparation for this lesson, the students have already been introduced to the terms ‘fraction’, ‘whole’, ‘unit’, ‘half’, ‘fourth’, ‘eighth’, ‘equivalent’, and the ‘fair share’ interpretation of fractions (Making Sense of Fractions, Gibson, CTA 2011) while using length models, set models, and area models of fractions (Making Sense of Fractions, Gibson, CTA 2011). The students have successfully been able to identify and model equivalent fractions, using concrete objects. Lastly, the children have also been able to create verbal stories to match the different models presented. Each child has an interactive notebook that includes all the previous vocabulary and the content of the lessons taught, so they can use them if they ‘get stuck’. (Assessment strategies to Increase Achievement, Mulligan, CTA 2011)

C. LEARNING OBJECTIVES and ASSESSMENT:

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| --- | --- | --- |
| Learning Objective | Bloom | Assessment (Formative/Summative) |
| Students will demonstrate a fair share by drawing pictures, making a chart, or by using manipulatives.  (Appendix A) | Applying  Evaluating  (Assessment strategies to Increase Achievement, Mulligan, CTA 2011) | Successful completion of chosen task card and successful evaluation of the others’ task cards. (Think, Pair, Share: Engaging Students Using Cooperative Learning, Strebe, CTA 2011).  Their task card will be included in their interactive notebook. They will receive a ‘+’ for each task completed successfully. These task cards will be in the notebook under the label ‘warm-ups’. They will be dated and progress can be easily monitored. |
| Students will manipulate parts of a whole and make a whole from fractional parts. | Remembering  Understanding  Applying  Analyzing | Students will completely and correctly cover their game boards with similar-colored fraction strips, then correctly label their fraction strips.  This game will be monitored throughout for successful completion. Questions, clues, and ‘think alouds’ may become necessary. |
| Students will demonstrate and describe equivalencies using the fraction strips. | Applying  Analyzing  Evaluating | Students will correctly demonstrate and describe 7 out of 9 equivalencies. |

D. Math SOL 6.2

The student will:

a) investigate and describe fractions, decimals, and percents as ratios;

b) identify a given fraction, decimal, or percent from a representation;

c) demonstrate equivalent relationships among fractions, decimals, and percents;

d) compare and order fractions, decimals, and percents.

E. MATERIALS NEEDED:

Materials already present on the table prior to the class:

* + Fair Share Cards
  + Class set of manipulatives (pattern blocks, fraction tiles, Cuisenaire rods, graph paper, cube sets, etc.)
  + Class sets of fraction strips
  + Parts is Parts game boards
  + Dice

Materials that each child is responsible for bringing to the table and cleaning up when requested:

* + Fine tip dry erase markers
  + Worksheet/pencil
  + Interactive notebooks

F. PROCEDURE

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| Time | Mathematical Tasks to be Used,  Teacher Thoughts/Actions/Questions | Anticipated Student Comments, Questions, Actions, and Strategies |
| 10-15 minutes | BEFORE:   * A Fair Share card will already be at the students’ place when they come into the class. They will get the supplies requested and sit at their seat. I will then ask them to select a card and use any of the classroom manipulatives to solve this task. (Think)   \*Remind them to review their lesson in their interactive notebook from the previous day.  \*Encourage them to think aloud how many wholes are there and how many parts do I need.  \*Encourage them to ask themselves how can I share?   * After 5-7 minutes, the students will switch places with another student and evaluate the answer provided. (Pair)   \*Ask each student ‘What did your friend do?’  \*Then ask- ‘Was it fair?’   * Lastly, they each will share with the group how the other person got their answer. (Share) | \* There are several cards in which the students have to realize how many people are included in the fair share.  \* Some fair shares are not going to be very ‘clean’ but the students have to be reminded to divide some items in parts.  \* Reinforce the use of words or concepts: divide, fair share, fractions, whole, and parts.  \* Some students may stumble with explaining how they got the answers – so let them show how they got it. |
| 15-25 minutes | DURING:  (Teacher will pass out the game boards, the fraction strip bags, and the dice.)   * Each student will have his own bag of unnamed fraction strips. (Appendix C) * Each student will empty his bag of strips. * The students will have a game board with six even strips or “wholes”. (Appendix B) * Each child will roll a die and must select that number of pieces from the pile of fraction strips. * The fraction strips must be placed on the game board in such a way that each “whole” will be divided into fair shares. * The first student to fill all 6 game boards with exact number of rolls – wins!   \*After the game directions are explained, the teacher will then model the process. The children will then be asked to demonstrate how to play the game. If all are successful, allow them to begin taking turns while you supervise.   * Following the game – allow the other two to complete their game cards. * Now ask each child to label their fraction strips with a fraction using the dry erase markers.   \*After they have marked their strips have them explain how they got their answer and how they know they are correct. (Making Sense of Fractions and Their Operations, Tyminski, CTA 2011) | \* Guided practice of several turns will help the students understand the game.  \* Reinforce the use of vocabulary words: whole, parts, fraction strips, fair share, parts of the whole.  \* As the game continues – remind the students that each whole must have pieces of the same size – fair share.  \* Also, remind the students that they must select the exact number of pieces that are represented on each roll of the die.  \* Example of the student’s rationale: ¼ ¼ ¼ ¼ - Four parts equal the whole and so each part is ¼. |
| 10-20 minutes | AFTER:   * Students will be given a worksheet in which they can use the fraction strips to explore equivalencies. (Appendix D) * They will each explain and demonstrate their solutions. * They will repeatedly use the words ‘parts of the whole’ and ‘equivalent to’ frequently throughout their explanations. | \* This is a good time to reinforce the use of words along with the demonstration of each of their answers.  \* Encourage the students to use the fractional terms: one fourth, one third, one half, one sixth, one eighth, one whole. |

G. MEETING THE NEEDS OF ALL STUDENTS:

This lesson was specifically created for these students. The depth of the SOL was narrowed for the lesson. Repetition of certain vocabulary words are built in to help with working memory and language skills. The use of manipulatives is most appropriate for use in teaching these three students taking into consideration their needs as stated in their IEPs. Transition from manipulatives to models to the abstraction of numerals is included throughout the lesson. Working together and checking each assignment allows for comfort and building confidence. Breaking the lesson into 3 parts assists the students in maintaining their attention throughout the entire lesson. Manipulation of the strips may be difficult for the child with orthopedic impairments but he can ask for assistance from his classmates.

H. WHAT COULD GO WRONG WITH THIS LESSON AND WHAT WILL YOU DO ABOUT IT?

Manipulation of the strips may be difficult for the student with orthopedic disabilities but he can always ask for physical assistance. The students may also become stuck with the worksheet problems that concern more than one whole. This can be resolved by using ‘think alouds’ while expressing the content that has been experienced. Also, reminding the students to ask themselves ‘what is the whole?’ and ‘what are the parts?’ may help. If all else fails – remind them to look back in their interactive notebook.

I. CONNECTION TO CTA:

The connections of this lesson to the speakers from the CTA have already been included in the text of the lessons and the preparation materials. Some of the materials presented do not apply to this lesson but would definitely be used in future lessons.

|  |  |
| --- | --- |
| Dakota has 2 subs. How can he share with two other friends?  MC900264396[1] MC900264396[1] | Curtis has 1 bag of candy with 28 pieces in it. How can he divide it into 3 bags?  MC900336142[1] |
| Austin has 24 inches of magnetic tape. He has to share with 2 other students. How long would each strip be?  MC900441351[1] | Dakota has 16 ounces of soda. His mom said to share it with his brother. How many ounces will each boy get?  MC900364272[1] |
| BJ wants to share his 48 marbles with his friends. He has 3 friends. How many marbles can he give each friend?  MC900232727[1] | Daniel has five brownies. He has to share with the other 5 people in his class. What part of a brownie would each person get? MP900424366[1] |

*Appendix A*

Fair Share Cards

*Appendix B*

Parts Is Parts Game Board

*Appendix C*

Fraction Strips

*Appendix D*

Equivalent Fraction Strips

\_\_\_\_\_\_\_ One-fourths = 3 one-eighths

4 one-sixths = \_\_\_\_\_\_\_ one-thirds

1 whole = \_\_\_\_\_\_\_\_\_ one-sixths

5 one-sixths = \_\_\_\_\_\_\_ one-thirds

4 one-halves = \_\_\_\_\_\_\_\_\_\_\_ wholes

6 one-eighths = \_\_\_\_\_\_\_\_\_\_ one-fourths

\_\_\_\_\_\_\_\_ One-sixths = 2 one-thirds

1 one-third = \_\_\_\_\_\_\_\_\_\_ one-sixths

3 one halves = \_\_\_\_\_\_ one-fourths

**LESSON PLAN OUTLINE**

A. TITLE OF LESSON: **Whole as an Area**

B. CONTEXT OF LESSON: The class I will be teaching this fall is titled: Developmental Math 6. It will be held 45 minutes daily. It will include 3 students who are labeled as Learning Disabled and/or Orthopedically Impaired. All 3 students have been evaluated in the 5th grade by using the VGLA (Virginia Grade Level Assessment) for Math only. Although these three students passed their VGLAs, they are unable to maintain the speed of the general education curriculum, require the use of multi-modal learning styles, require extensive use of accommodations and modifications, and have difficulty with their working memory. Since these students can no longer be evaluated using the VGLA, our school has created a class that will teach them the Math 6 SOLs at their speed and their level, and prepare them to take the 6th grade Math Plain English SOL Assessment or possibly the VMAST.

In preparation for this lesson, the students have already been introduced to the terms ‘fraction’, ‘whole’, ‘unit’, ‘half’, ‘fourth’, ‘eighth’, ‘equivalent’, and the ‘fair share’ interpretation of fractions (Making Sense of Fractions, Gibson, CTA 2011) while using length models, set models, and area models of fractions (Making Sense of Fractions, Gibson, CTA 2011). The students have successfully been able to identify and model equivalent fractions, using concrete objects. Lastly, the children have also been able to create verbal stories to match the different models presented. Each child has an interactive notebook that includes all the previous vocabulary and the content of the lessons taught, so they can use them if they ‘get stuck’. (Assessment strategies to Increase Achievement, Mulligan, CTA 2011)

This lesson will follow the Parts is Parts lesson. The students will better understand what wholes are and how to divide the wholes into fair parts. Assuming that the previous lesson was successful, the students will review and show that they understand the previous lesson, then they will be introduced to a whole as being the area of an object. An understanding of area must be in their skills prior to this lesson.

C. LEARNING OBJECTIVES and ASSESSMENT:

|  |  |  |
| --- | --- | --- |
| Learning Objective | Bloom | Assessment (Formative/Summative) |
| Students will work together to demonstrate different ways to cover the area of a given shape with fair shares.  (Quilt Squares: Making Sense of Fractions, Gibson, CTA 2011) | Applying  Evaluating  (Assessment strategies to Increase Achievement, Mulligan, CTA 2011) | Successful completion of given task and successful evaluation of the others’ task cards. (Respect – Defense – Consensus: Engaging Students Using Cooperative Learning, Strebe, CTA 2011).  The Quilt Squares along with outlined or colored sections of their solutions to their square will be included in their interactive notebook. They will receive a ‘+’ for each task completed successfully. These task cards will be in the notebook under the label ‘warm-ups’. They will be dated and progress can be easily monitored. |
| Students will demonstrate their understanding of linking an area model to fractions and percents. | Remembering  Understanding  Applying  Analyzing | Using centimeter graph paper, the students will correctly create 10x10 squares. Then they will color in the area requested. Then by counting, the students will be able to write a fraction to match the colored sections. Then students will determine the percent that accompanies that fraction. (Linking Fractions, Decimals, and Percents Using an Area Model: Making Sense of Fractions, Gibson, CTA 2011) |
| Students will demonstrate and describe equivalencies using the 10x10 graph squares. | Applying  Analyzing  Evaluating | Students will correctly demonstrate and describe 5 out of 6 equations. |

D. Math SOL 6.2

The student will:

a) investigate and describe fractions, decimals, and percents as ratios;

b) identify a given fraction, decimal, or percent from a representation;

c) demonstrate equivalent relationships among fractions, decimals, and percents;

d) compare and order fractions, decimals, and percents.

E. MATERIALS NEEDED:

Materials already present on the table prior to the class:

* + Graph paper
  + Colored pencils
  + Pattern blocks
  + Quilt Squares

Materials that each child is responsible for bringing to the table and cleaning up when

requested:

* + Worksheet/pencil
  + Interactive notebooks

F. PROCEDURE

|  |  |  |
| --- | --- | --- |
| Time | Mathematical Tasks to be Used,  Teacher Thoughts/Actions/Questions | Anticipated Student Comments, Questions, Actions, and Strategies |
| 10 minutes | BEFORE:   * Ask the students to get one quilt square each. * Have each one create a fair share pattern on the square. * Then have them share their pattern with the group and decide if it is a fair share and how many patterns fill that square. * This should continue until each child has a fair share quilt pattern to place in their notebook. | \* There are many ways that they can fill their square. Encourage creativity in their fair share patterns.  \* Some fair shares are not going to be very ‘clean’ but a good discussion of why it is or is not a fair share would be beneficial.  \* Reinforce the use of words or concepts: divide, fair share, fractions, whole, parts, and area.  \* Be sure to accent the fact that ‘area’ covers. They may want to put this in their notebook along with a clue word like “on”. |
| 15-25 minutes | DURING:   * Each child should get a sheet of graph paper * Have them divide the graph paper into squares of 10X10 by outlining the square in red. (limit it to 4 squares) * In the first square have every child color in any 20 squares. * In the second square have every child color in any 13 squares. * In the third square have every child color in any 42 squares. * In the final square have every child color in any 85 squares. * Now ask each child to label their squares with a fraction. Have them discuss their answers and come to a consensus. (Respect – Defense – Consensus: Engaging Students Using Cooperative Learning, Strebe, CTA 2011). * After they have marked their squares have them explain how they got their answers and how they know they are correct. (Making Sense of Fractions and Their Operations, Tyminski, CTA 2011) Have them discuss their answers and come to a consensus. (Respect – Defense – Consensus: Engaging Students Using Cooperative Learning, Strebe, CTA 2011). * Remind the students that percents are simply the number per each hundred. * Now ask each child to label their squares as a percent. Have them discuss their answers and come to a consensus. (Respect – Defense – Consensus: Engaging Students Using Cooperative Learning, Strebe, CTA 2011). * After they have determined the percents, have them explain how they got their answers and how they know they are correct. (Making Sense of Fractions and Their Operations, Tyminski, CTA 2011)Have them discuss their answers and come to a consensus. (Respect – Defense – Consensus: Engaging Students Using Cooperative Learning, Strebe, CTA 2011). | \* Guided the students through their first square. If they count each individual square to 100 – take time to discuss other ways to group them so they could get to 100 quicker.  \* Reinforce the use of vocabulary words: whole, parts, fraction strips, fair share, area, and parts of the whole.  \* Encourage the students to use random squares at some point.  \* Discuss the different ways to group the numbers.  \*Ask them how they can remember how to write these fractions. ( examples: #/100 or parts/whole)  \*Ask them – ‘does it matter where the 20 squares are?’ – ‘why or why not’  \* Ask them to write the definition of percent in their notebook. (Percent is the # per 100) Be sure to include the symbol %, and give them the clue that there are 100 **cent**s in a dollar and per**cent** is out of 100. Also, show them that if they shift the different aspects of the % symbol around – they can get 100. |
| 10-20  minutes | AFTER:   * Have the students turn their graph paper over. * Have them write equations using the fractions they wrote and the percents they wrote. (Example: 20/100 =20%) * Ask them if they can make a rule from their equations. (Connecting Arithmetic to Algebra, Joseph Hill, CTA 2011) * Discuss these rules, come to a group rule, and put it in their notebook along with the percent definition. (Respect – Defense – Consensus: Engaging Students Using Cooperative Learning, Strebe, CTA 2011). | \* Remind the students that an equation has an = sign.  \* Encourage the students to read their equations so they can practice reading math symbols.  \* Help them realize that the numerator, if it is over a denominator of 100, can be simply made into a percent. |

G. MEETING THE NEEDS OF ALL STUDENTS:

This lesson was specifically created for these students. The depth of the SOL was narrowed for the lesson. The next steps would include decimals, then finally, comparing and ordering. Repetition of certain vocabulary words are built in to help with working memory and language skills. The use of manipulatives is most appropriate for use in teaching these three students taking into consideration their needs as stated in their IEPs. Transition from manipulatives to models to the abstraction of numerals is included throughout the lesson. Working together and checking each assignment allows for comfort and building confidence. Breaking the lesson into 3 parts assists the students in maintaining their attention throughout the entire lesson. Manipulation of the strips may be difficult for the child with orthopedic impairments but he can ask for assistance from his classmates.

H. WHAT COULD GO WRONG WITH THIS LESSON AND WHAT WILL YOU DO ABOUT IT?

During the quilt squares activity, the students may all try to copy each other’s pattern. They will need to be encouraged to be creative. Using different colors for the fair shares may help. Another possibility is that they may choose to color in the large diamond shapes and they will have to be talked through or even shown the fair shares. Also, the concept of area may also have to be made into a vocabulary diagram including definition, examples and non-examples. (Assessment strategies to Increase Achievement, Mulligan, CTA 2011)

During the graph paper activity, the students may take a long time to construct one square because they are counting 100 little squares. Just take the time to remind them about grouping. In the first square, a student may come up with 1 fair share out of 5 rectangles, that is okay, just direct them to see a larger picture, 20 out of 100. This will help with the equations later. Also, the concept of percent may also have to be made into a vocabulary diagram including definition, examples and non-examples. (Assessment strategies to Increase Achievement, Mulligan, CTA 2011

Lastly, the students may have to be reminded what an equation is – remind them- this concept may also have to be made into a vocabulary diagram including definition, examples and non-examples. (Assessment strategies to Increase Achievement, Mulligan, CTA 2011

I. CONNECTION TO CTA:

The connections of this lesson to the speakers from the CTA have already been included in the text of the lessons and the preparation materials. Some of the materials presented do not apply to this lesson but would definitely be used in future lessons.