Student: Carly Bock Professor: Prof. Rickey Moroney

Course: EDU 521 Date: April 15th, 2015

Grade: 7th Topic: The Distance Between Two Rational Numbers Content Area:Math

# INSTRUCTIONAL OBJECTIVE(S)

After a lesson about the distance of two rational numbers and real-life applications of solving for distance, students will participate in a review game of word problems, and will answer at least one question correctly, and will complete a ten question quiz for homework, achieving a score of 3 or better on the accompanying rubric.

### STANDARDS AND INDICATORS FROM NEW YORK STATE

### COMMON CORE LEARNING STANDARDS

Common Core Standards Addressed:

7.NS.1.b: Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

*Indicator*: This will be evident when students view the YouTube video at the beginning of the period, which defines absolute value and explains it in relevant real-life contexts.

7.NS.1.c: Understand subtraction of rational numbers as adding the additive inverse, p-q = p + (-q). Show that the distance between two rational numbers on the number line is the absolute value of their distance, and apply this principle in real-world contexts.

*Indicator*: This will be evident when students apply the knowledge from the lesson to word problems in real-life contexts in both the review game at the end of the lesson and the homework assignment.

ISTE Standards Addressed

2. Communication and Collaboration

*Indicator:* This will be evident during the partner work during which students will work together to solve problems and clarify the definition of absolute value and distance.

4. Critical Thinking, Problem Solving, and Decision Making

*Indicator:* This will be evident when students work on both the independent problem set activity, and the group review game at the end of the lesson.

# MOTIVATION

Students will view a short YouTube video which will introduce and explain the concept of absolute value. The end of the video introduces how absolute value has applications in the real world, which will begin to convey to the students why this lesson will be important for them.

MATERIALS

Computer (With Internet Access)

SMART Board

Soft ball (Koosh ball, etc.)

SMART Notebook Activity

# STRATEGIES

Do Now Activity

Direct Instruction

Group Activity

Convergent and Divergent Questioning

Guided and Independent Practice

Formative and Summative Assessments

Delineation of Independent Practice Activity

ADAPTATIONS

Students with visual disabilities will be provided with a personal iPad with a copy of the SMART Notebook activity so that they can see the questions up close and take their time to read them.

Students who are English Language Learners will be provided with relevant vocabulary words and their definitions prior to the lesson.

Students with learning disabilities will be provided with supplementary materials and additional practice problems.

## **DIFFERENTIATION OF INSTRUCTION**

Teachers believe that students have individual differences in their learning styles and abilities. Content, process, and product should be differentiated.

This lesson is designed to reach students of all learning styles, with a video for visual learners, practice problems and discussion for auditory learners, group work for collaborative learners, and an interactive activity for kinesthetic learners.

# DEVELOPMENTAL PROCEDURES

Developmental Procedures include Activities and Key Questions.

1. Students will view a brief YouTube video which will introduce the material that will be taught in the lesson.

a. *What is absolute value? How would you define it in your own words?*

b. *What are some real life applications of solving for absolute value?*

2. Absolute value will be defined as the distance between a number and zero on the number line.

3. Using the definition from the teacher and the information from the video, students will work in pairs on an exercise designed to have them count the number of units that make up the distance between two numbers on a number line. The activity is designed to show them that distance is always the same if the endpoints are the same.

a. *Why is the distance the same if we switch the signs of the numbers?*

b. *Is the distance you travel from your house to school the same as the distance*

*from school to your house? Why is that so?*

4. After using the number line to find distance and absolute value, students will be introduced to the absolute value formula.

5. Students will work independently on a set of practice problems using the formula.

6. After reviewing the answers to the problem set, the whole class will move on to a SMART Notebook activity, which will serve as both a review of the lesson and the exit ticket. Each student will have a turn to answer a question, and they must do so correctly as their exit ticket from the class.

7. The homework will be assigned and explained, and any additional questions will be addressed.

# ASSESSMENT

At the conclusion of the lesson, the entire class will participate in a review game of “Whack-A-Mole,” a SMART Notebook Activity. The activity has 20 word problems with real life applications of distance between rational numbers, such as distance traveled, money earned or spent, and temperature change. Each student has the chance to throw a soft ball at the SMART Board, and wherever the ball hits indicates which question they will have to answer. Every student will continue until they get a problem right, and their correct answer will serve as their exit ticket from class.

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| |  | | --- | | Math - Problem Solving : The Distance Between Two Rational Numbers Teacher Name: **Carly Bock**    Student Name:     \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |

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| CATEGORY | **4** | **3** | **2** | **1** |
| **Completion** | All problems are completed. | All but one of the problems are completed. | All but two of the problems are completed. | Several of the problems are not completed. |
| **Mathematical Concepts** | Explanation shows complete understanding of the mathematical concepts used to solve the problem(s). | Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s). | Explanation shows some understanding of the mathematical concepts needed to solve the problem(s). | Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written. |
| **Mathematical Errors** | 90-100% of the steps and solutions have no mathematical errors. | Almost all (85-89%) of the steps and solutions have no mathematical errors. | Most (75-84%) of the steps and solutions have no mathematical errors. | More than 75% of the steps and solutions have mathematical errors. |
| **Neatness and Organization** | The work is presented in a neat, clear, organized fashion that is easy to read. | The work is presented in a neat and organized fashion that is usually easy to read. | The work is presented in an organized fashion but may be hard to read at times. | The work appears sloppy and unorganized. It is hard to know what information goes together. |

## **INDEPENDENT PRACTICE**

After the lesson, students will be directed to two internet pages which will review the content that was taught. Each page has a review section to reinforce the information, or perhaps present it in a new way for students who may need additional help. At the end of the review sections, there are practice problems that the students may work on as needed. After visiting the two review pages, students are directed to another website, which will administer a quiz of ten word problems about the real-life applications of the material discussed in class. Students must show their work on a separate sheet of paper as they work on the quiz questions. Students must complete the quiz and print out the page as proof of completion and staple it to the page showing their work. Both pages are to be handed in at the beginning of the next class period. The Independent Practice Activity will be graded according to the rubric provided.

# FOLLOW-UP: ACADEMIC INTERVENTION AND ACADEMIC ENRICHMENT

*Academic Intervention*

Students who are struggling with the material after the conclusion of the lesson are encouraged to attend an extra help session either before or after school. These students will be given additional practice problems, and encouraged to consult additional resources, such as the review websites, Glogsters, and Apps, all of which are available through the class website.

*Academic Enrichment*

Students who are confident in their understanding of the material and are succeeding with practice problems will be asked to help their fellow classmates who may be having a more difficult time. They will also be provided with the opportunity to write word problems of their own about real-life applications of the distance between two rational numbers, with the guarantee that at least one of their questions (provided it is correct) will appear on the unit test.

# TEACHER REFERENCES

Lesson 6: The Distance Between Two Rational Numbers. Engage NY, Common Core

Curriculum. <https://www.engageny.org/resource/grade-7-mathematics-module-2-topic-lesson-6>

Addition and Subtraction of Integers and Rational Numbers.

<http://integersandrationalnumbers.weebly.com>

Planet Nutshell. “Math Shorts Episode 10- Absolute Value”

<https://www.youtube.com/watch?v=wrof6Dw63Es>

ISTE Standards for Students.

<https://www.iste.org/docs/pdfs/20-14_ISTE_Standards-S_PDF.pdf>