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|-------------------|----------------------------|---------------------------|-----------|----------------------------|----|--|
| <b>Teacher(s)</b> | Hawkins, Gravely, Campbell | <b>Subject discipline</b> | group and | 7 <sup>th</sup> Grade Math |    |  |
| <b>Unit title</b> | The Number System          | <b>MYP year</b>           | 2         | <b>Unit duration (hrs)</b> | 31 |  |

**Inquiry: Establishing the purpose of the unit**

|   |                           |                                    |
|---|---------------------------|------------------------------------|
| <b>Key concept</b>  | <b>Related concept(s)</b> | <b>Global context</b>              |
| <b>Connections</b>  | <b>Measurement</b>        | <b>Identities and Relationship</b> |
| <b>Statement of inquiry</b>   |                           |                                    |
| Numbers can assist in connecting different situations and measuring the changes in relationships and identities.  |                           |                                    |
| <b>Inquiry questions</b>  |                           |                                    |
| <p><b>Factual—</b> How do we compute with integers and rational numbers? How do we make generalizations about integers?</p> <p><b>Conceptual—</b> How do mathematical rules help make generalizations to solve problems?</p> <p><b>Debatable—</b> Why do we need negative rational numbers?</p> |                           |                                    |

| Objectives   | Summative assessment   |   |
|--|--|---|
| <p><b>NEEDS TO CHANGE TO C:<br/>COMMUNICATING</b></p> <p>D. Applying Math in Real Life Contexts</p> <ol style="list-style-type: none"> <li>identify relevant elements of authentic real-life situations</li> <li>select appropriate mathematical strategies when solving authentic real-life situations</li> <li>apply the selected mathematical strategies successfully to reach a solution</li> <li>explain the degree of accuracy of a solution</li> <li>explain whether a solution makes sense in the context of the authentic real-life situation.</li> </ol> | <p>Outline of summative assessment task(s) including assessment criteria:</p> <p>Your friends, Mai and Wes played a board game. At the end of the game, each player had a negative balance in the bank. Mai's balance was the greater number, so she won the game. However, neither Mai nor Wesley remember who had which cards.</p> <p>From the list of cards, students must find cards that Mai could have picked and cards that Wes could have picked to make the players' claim correct. They will create a poster displaying Mai's cards and Wes' cards, with the amount displayed on each card as a positive or negative number.</p> <p>Assessment will require students to create a scenario where Mai and Wes both have a negative score but Mai is still the winner; to prove that Mai could have won the game with a negative balance. The student will show mastery of working with positive and negative integers.</p> | <p>Relationship between summative assessment task(s) and statement of inquiry:</p> <p>Student will present their findings in a way that clearly shows which cards are Mai's and which are Wes's and each person's score and the winner.</p> <p>The student will reflect and write about what went into their decision making process and how they knew which cards presented a positive or negative number.</p> |
| Approaches to learning (ATL)   |  |   |
| <p>Communication Skills- Students will need to communicate their findings in an organized and logical format.</p> <p>Thinking Skills- Use prioritization and order of precedence in problem solving.</p>   |  |   |

## Action: Teaching and learning through inquiry

| Content   | Learning process   |
|---|--|
| <p><b>(M) 7.NS.01a</b> Describe situations in which opposite quantities combine to make 0. <i>For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</i></p> <p><b>(M) 7.NS.01b</b> Understand <math>p + q</math> as the number located a distance <math> q </math> from <math>p</math>, in the positive or negative direction depending on whether <math>q</math> 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.</p> <p><b>(M) 7.NS.01c</b> Understand subtraction of rational numbers as adding the additive inverse, <math>p - q = p + (-q)</math>. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p><b>(M) 7.NS.01d</b> Apply properties of operations as strategies to add and subtract rational numbers.</p> <p><b>(M) 7.NS.02a</b> Understand that multiplication is extended from fractions to rational</p> | <p><b>Learning experiences and teaching strategies</b></p> <p>Student will work to develop understanding of the relationship between positive and negative integers. TSW will be able to determine the absolute value of any given integer and its additive inverse. TSW continue with exploring what are rational numbers and how to complete all four operations (addition, subtraction, multiplication, and division) with rational numbers. TSW be able to determine if a number is rational or not (can be converted to a fraction). TSW solve real world problems with all four operations using rational numbers.</p> <p><b>Formative assessment</b></p> <p>Quiz- Adding and Subtraction of Integers</p> <p>Quiz- Multiplying and Dividing Integers</p> <p>Quiz- Adding and Subtraction of Rational Numbers</p> <p>Quiz- Multiplying and Dividing of Rational Numbers</p> <p>Quiz- Solving Multi-Step Word Problems with Rational Numbers</p> <p><b>Differentiation</b></p> <p>Quizzes- Students with accommodations will be given multiple choice questions with one answer eliminated and for short answer problem be given a sentence starter. When appropriate, students will be given the equations to use to solve the problem.</p> |

numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as  $(-1)(-1) = 1$  and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

**(M) 7.NS.02b** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If  $p$

and  $q$  are integers, then  $-\frac{p}{q} = \frac{-p}{q} = \frac{p}{-q}$ . Interpret quotients of rational numbers by describing real-world contexts.

**(M) 7.NS.02c** Apply properties of operations as strategies to multiply and divide rational numbers.

**(M) 7.NS.02d** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

**(M) 7.NS.03** Solve real-world and mathematical problems involving the four operations with rational numbers.  
(Computations with rational numbers

Summative Assessment - Lower level students will be provided with calculators to check their work. Higher level students will be required to do all computations by hand.

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| <p>extend the rules for manipulating fractions to complex fractions.)</p> <p><b>(M) 7.EE.03</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p> |  |
| <b>Resources</b>   |  |
| Web links, Kuta Software, TNReady workbooks, Teacher created worksheets  |  |

**Reflection: Considering the planning, process and impact of the inquiry**

| Prior to teaching the unit  | During teaching   | After teaching the unit  |
|---|---|--|
| <p>Students must know how to add, subtract, multiply, and divide positive numbers. Students must be able to distinguish between place values. Students must know how to solve a multi-step word problems.</p> | <p>Students at first struggled with subtracting negative numbers but after practicing a variety of problems grasped the concept better.</p> <p>Students did well converting from decimals to fractions and back again.</p> <p>While teaching, did a review of steps to solve a word problem once it became apparent</p> | <p>Students that struggled with integer computation became more confident as we moved onto rational numbers because the skills were reviewed.</p> <p>Students enjoyed the challenge of the task and were able to complete the task successfully with minimal prompting from the teacher.</p> |

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|  | students were missing what the question was actually asking. | Students were able to prompt and aid each other to solve the problem. |
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