Teacher(s): Mrs. Breazeale (Ms. DeBLanc) \& Mr. Contreras
Subject/Grade: $7^{\text {th }}$ /Grade Math
Domain: Ratios \& Proportions - Lesson Plan Title: PROPORTIONAL RELATIONSHIPS \& SCALE FACTOR

|  | MATHEMATICS - Mississippi College and Career Readiness Standards for 7 ${ }^{\text {th }}$ Grade |
| :---: | :---: |
| Numbers \& Operations | 7.NS. 1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addi... - |
| Ratios \& Proportions | 7.RP Analyze proportional relationships and use them to solve real-world and mathematical problems. <br> 7.RP. 1 Compute unit rates associated with ratios and fractions, including ratios or lengths, areas and other quantities measured in li... <br> 7.RP. 2 Recognize and represent proportional relationships between quantities. <br> 7.RP.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing ... <br> 7.RP.2b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of propor... <br> 7.RP.2c. Represent proportional relationships by equations. <br> 7.RP.2d . Explain what a point ( $x, y$ ) on the graph of a proportional relationship means in terms of the situation, with special attentio... <br> 7.RP. 3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and ma... |
| Geometry | 7.G Draw, construct, and describe geometrical figures and describe the relationships between them. 7.G.1 Solve problems involving geometric figures, including actual lengths and area of a scale drawing. |

Bottom 25\%: Students will be placed in groups based on ability. The general education teacher and the inclusion teacher will review their MPT. The general education teacher and the inclusion teacher will review their MPT and clear up any misconceptions on Tuesday and Thursday.

Top 25\%: Students will work through problems on math prodigy while the teacher pulls students that scored below 70\% on their current MPT.

Bubbles: Students will be placed in groups based on their ability. Some with higher performing students and some with lower performing students. The students in the higher performing group will learn from their peers and the students in the lower performing groups will act as a tutor to their peers. The general education teacher and the inclusion teacher will review their MPT and clear up any misconceptions on Tuesday and Thursday.

ESSENTIAL QUESTION(S): How do mathematicians analyze proportional relationships and use them to solve real-world and mathematical problems including problems that contain scale drawings?

| Date | Day | Objective | Focus Question | I will... |
| :---: | :---: | :---: | :---: | :---: |
| 9/11 | M | TSWBAT use given data to complete a table, graph, and write an equation to represent a proportional relationship by completing an activity sheet with $75 \%$ accuracy by the end of the lesson. | 1) How do I graph proportional relationships? <br> 2) How do I write an equation to represent a proportional relationship? <br> 3) How do I complete a table that represents a proportional relationship? | -Graph proportional relationships. -Write equations to represent proportional relationships. <br> -Complete a table that represents a proportional relationship. |
| 9/12 | T | TSWBAT complete an iReady math lesson by taking notes on key vocabulary and at least two example problems with $80 \%$ accuracy by the end of the lesson. | 1) How do mathematicians use iReady to enhance their mathematical skills? <br> 2) How will I use scale factor to calculate unknown lengths? | -Use iReady to enhance my mathematical skills. <br> -Understand that scale drawings are figures with the same angles and with side lengths in equivalent ratios. -Calculate and use scale factor to find unknown length. |
| 9/13 | W | TSWBAT examine, analyze, and correct their current mixed practice test (MPT) by reviewing resources provided by the teacher, consulting with peers, and/or asking the teacher for help with $100 \%$ accuracy by the end of the lesson. | How do mathematicians analyze and correct their graded tests in order to reflect on knowledge needed to master 7th grade math standards? | -Differentiate between silly mistakes and lack of knowledge. <br> -In writing, explain the silly mistake and rework the problems that contain silly mistakes. <br> -Use resources to help correct mistakes where mastery is not yet obtained. |
| 9/14 | Th | TBA based on MPT data. | TBA | TBA |
| 9/15 | F | TSWBAT compute actual lengths and areas from a scale drawing by completing practice problems out of the RCC workbook with $80 \%$ accuracy by the end of the lesson | 1) How can mathematicians compute actual lengths and areas from a scale drawing? <br> 2)How can mathematicians compute unit rates associated with ratios of fractions, including ratios of lengths? | -Compute actual lengths and areas from a scale drawing. <br> -Compute unit rates associated with ratios of fractions, including ratios of lengths. |

## MONDAY_Sep 11, 2023

WARM-UP: The student will analyze a graph and write at least 3 facts and/or observations learned from studying the graph. (5 minutes)

## ANTICIPATORY SET: (3 minutes)

(HOOK) TTW say, "I am going to show you how to complete a table, graph, and write an equation that represents a proportional relationship. (REAL-WORLD CONNECIION) This skill will help you when food prep, calculating time for road trips, scaling on a map and distance between two cities, cost of an object verses the number of items purchased, finding the best deals when shopping, wages per hour, and much more. Say (LESSON GOAL) By the end of the lesson, you will be able to complete a table to represent a proportional relationship. Create graphs to represent proportional relationships, and write an equation to represent proportional relationships.

## TEACHER INPUT: (I do.) (15 minutes)

The teacher will ...

- Pass out an activity sheet on 7.RP.1,2,\&3.
- Choose a student to read the problem.
- Direct students to look at the table and tell them to write " $x$ " in the "time in days" column and $a$ " $y$ " in the "total distance (km)" column.
- Point out what is given: $(3,42)$ and ask a random student what we should do to complete the table. (Find the constant of proportionality. Other names: slope, rise/run, $\mathbf{y} / \mathbf{x}$ ))
- Demonstrate while asking random students to help complete the table.
- Direct students to the coordinate plane. Explain how to graph the information on the table.
- Demonstrate.
- Direct students to the section that says "Equation."
- Tell students to write $\mathbf{y}=\mathrm{mx}$ at the top of their paper. Tell students this is a template to write any equations to represent proportional relationships.
- Explain that the y represents the y coordinate and the x represents the x coordinate and the m represents the constant of proportionality AKA slope.
- Show students that all we have to do to write an equation to represent a proportional relationship is to replace the " m " with the constant of proportionality.
- Choose a student to answer questions $1 A$, then $1 B$, then $1 C$.
- Ask if there is any questions.


## GUIDED INSTRUCTION: (We do.) (10 minutes)

The teacher will ...

- Direct students to question 2 and choose a student to read.
- Write $(0,0)$ on the table and tell students that every proportional relationship will go through this point known as the origin and will be a straight line.
- Tell students that we can find the constant of proportionality by dividing any $y$ by its corresponding $x$.
- Tell students to pick a point that is nice - meaning when the x and y are both whole numbers or integers.
- Direct students to the point $(8,60)$.
- Ask a random student what the constant of proportionality of this graph is (Answer: 7.5). Ask how they calculated their answer. (Answer: Divide 60 by 8)
- Tell students to tell two people around them how to calculate the constant of proportionality.
- Show students that we have everything we need to write an equation to represent this graph.
- Write $\mathrm{y}=\mathrm{mx}$ on the paper and then replace the " $m$ " with the constant of proportionality. The equation to represent this graph is $\mathrm{y}=7.5 \mathrm{x}$.
- Tell students to tell two people how to write an equation to represent a proportional relationship.
- Tell students we can use this equation to complete the table.
- Show how to use the equation to complete the table while asking random students to help complete.
- Tell students to tell two people around them how to complete a table using an equation.
- Call on two random students to answer questions 2A and 2B.


## INDEPENDENT PRACTICE: (You do.) ( 15 minutes)

The student will ...

- Complete problems 5 (and 5A, 5B, 5C, and 5D), 8(and 8A)
- The teacher will lap the room giving constructive feedback.
- Bottom 25 students will work in a small group with the general ed teacher or inclusion teacher.

STUDENT REFLECTION/EXIT TICKET: TTW ask random students today's focus questions.1) How do I graph proportional relationships? 2) How do I write an equation to represent a proportional relationship? 3) How do I complete a table that represents a proportional relationship? (2 minutes)

HOMEWORK: Finish the activity sheet questions 9, 9A, 9B, 9C, 9D, 10, 10A, 10B, 10C, 10D, 11, 11A, 11B, 11C, 11D, 11E, \& 11F. (DUE FRIDAY, SEPTEMBER 15TH.)
MATERIALS: projector, 7.RP.1, 2, \& 3 activity sheets, calculators
ASSESSMENT(S): Teacher observation

## TUESDAY_Sep 12,2023

## MPT 1.7 will be given this morning.

WARM-UP/HOOK: The student will login to iReady and choose "Use Scale Factor." Take notes on lesson vocabulary and lesson goals. (5 minutes)

## TEACHER INPUT: ( 5 minutes)

The teacher will ...

- Present the lesson objectives.
- Review the requirements to receive help on the lesson quiz - all vocabulary with definitions must be written down, at least 3 examples recorded from the lesson, and I need to see evidence that the students attempted to work out the current problem on paper.


## INDEPENDENT PRACTICE: ( 30 minutes)

The student will ...

- Listen and complete the assigned lesson to the best of their ability.
- Complete the lesson quiz with $80 \%$ or higher accuracy.
- The general education teacher and/or the inclusion teacher will periodically check on students while asking them questions about the lesson.

SIUDENI REFLECIION/EXIT TICKEI: The student will complete an exit ticket based on today's learning target. The teacher will use this data to determine which students need extra support. ( 5 minutes)

MATERIALS: notebook paper or "iReady Notes template," computers, projector, exit tickets
ASSESSMENI(S): Teacher observation, exit tickets, iReady lesson quiz results

MPT 1.7 Results

| Class | 0\% - 49\% (Critical) | 50\% - 69\% (Emerging) | 70\% - 100\% (Proficient) |
| :--- | :--- | :--- | :--- |
| 1st |  |  |  |
| 3rd |  |  |  |
| 4th |  |  |  |
| 5th |  |  |  |

## WEDNESDAY_ Sep 13, 2023

WARM-UP/HOOK: The student willgrab a data analysis sheet and a class set of Tuesday's test. Write their name, date, etc. The teacher will pass back their Tuesday tests. ( 5 minutes)

## TEACHER INPUT: ( 2 minutes)

The teacher will ...

- Direct student to mark an "X" on the questions that the students missed.
- Explain that they will use the class set of the test that includes "Teacher Notes" to rework the problems and/or explain what silly mistake they made.


## INDEPENDENT PRACTICE: ( 30 minutes)

The student will ...

- Rework problems on their test paper.
- Justify why they missed certain problems.
- Compare their graded test to the teacher's class set/guided notes and questions.
- Identify careless mistakes and correct them.
- Use the UNRAVEL test taking strategy for math for questions not understood.
- Notify the teacher when they think they are finished for feedback/review.
- Staple data analysis sheet to the top of their test.
- Get it signed by their parents or guardian and return the following day


## Meanwhile...

TEACHER CONFERENCES: The teacher will invite individual students to her desk to discuss their most recent MPT and clear up any misconceptions and offer support. ( 30 minutes)

EARLY FINISHERS: The student will get iReady or Math Prodigy and wait patiently to be called to the teacher's desk to discuss the test and any misconceptions.

## TEACHER INPUT: ( 10 minutes)

The teacher will ...

- Review the most missed problems or take any questions the students have.
- Check over student work and provide feedback.
- Choose a student to staple the remainder of the student's paper.
- Explain that it is mandatory to bring their tests back signed by tomorrow.

STUDENT REFLECTION/EXIT TICKET: The student will complete an exit ticket based on the most missed question(s). The teacher will use this data to determine which students need extra support. ( 5 minutes)

MATERIALS: graded Tuesday tests, test analysis sheets, stapler, staples, exit tickets ASSESSMENT(S): Teacher observation, exit tickets, Tuesday test


## FRIDAY_ Sep 15, 2023

Bell Ringer: Students will complete a review question from the previous week. (7.G.4.) (5 minutes) Explain bell ringer. (2 minutes)

Anticipatory Set: (3 minutes)
Introduction: TTW Explain what the students are learning, why they are learning standard, and how they will know they have mastered it. Show sample problems of the standard.

Review: Homework from Monday. (5 minutes)
Teacher Input: (15 minutes) (7.G.1)
The teacher will...

- Students will open their iReady workbooks to page 3 and gently tear out.
- As a class, read the family letter while annotating.
- Direct students to page 9. Read the problem out loud. Ask a random student, "What is the problem about?"
- Ask a student to reread the problem. Ask a random student, "What are we trying to find out?"
- Have students read the problem one more time silently. Ask a random student, "What information is important?"
- Discuss and work through the problem.
- Show the following video "Scale Factor" at https://www.youtube.com/watch?v=XtkU4VkWh8I.

Guided Instruction : (5 minutes) (7.G. 1 \& 7.RP.1)
The teacher will...

- Direct students to page 13 and read out loud.
- Ask a random student, "What is the problem about?"
- Ask a student to reread the problem. Ask a random student, "What are we trying to find out?"
- Have students read the problem one more time silently. Ask a random student, "What information is important?"
- Discuss and work through the problem.


## Independent Practice (Breazeale \& Gros will switch back and forth.) (20 minutes) (7.G.1 \& 7.RP.1)

The student will...

- Complete problems 2, 3, 4, and 5 on pages 13 \& 14 .

Closure: TTW will ask the focus questions and discuss, 1) How can mathematicians compute actual lengths and areas from a scale drawing?
2)How can mathematicians compute unit rates associated with ratios of fractions, including ratios of lengths? (3 minutes.) Assessment: Teacher observations and completed work.
Early Finishers: iReady

## MISSISSIPPI STATE STANDARDS ACROSS CURRICULUM

## Math Standards

## Numbers \& Operations:

7.NS. 3 Solve real-world and mathematical problems involving the four operations with rational numbers.

## Ratios \& Proportions:

7.RP Analyze proportional relationships and use them to solve real-world and mathematical problems.
7.RP. 1 Compute unit rates associated with ratios and fractions, including ratios or lengths, areas and other quantities measured in like of different units.
7.RP. 2 Recognize and represent proportional relationships between quantities.
7.RP. $2 a$ Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
7.RP.2b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.2c. Represent proportional relationships by equations.
7.RP.2d . Explain what a point ( $x, y$ ) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0,0)$ and $(1, r)$ where $r$ is the unit rate.
7.RP. 3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error

## Geometry:

7.G Draw, construct, and describe geometrical figures and describe the relationships between them.
7.G.1 Solve problems involving geometric figures, including actual lengths and area of a scale drawing.

