

Content: Math	Grade/Course: 3 rd Grade	Timeline: Week 5
Standard/s 3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.		
Lesson Overview: This standard calls for students to solve elapsed time, including word problems. Students could use clock models or number lines to solve. On the number line, students should be given the opportunities to determine the intervals and size of jumps on their number line. Students could use pre-determined number lines (intervals every 5 or 15 minutes) or open number lines (intervals determined by students).		Lesson Objective(s): In this lesson, students will be able to <ul style="list-style-type: none"> Identify the start time, end time or change in time in a word problem and figure out which is unknown. Represent elapsed time word problems using a number line or clock models.
Vocabulary: elapsed time, start time, end time, change in time		Focus Question(s): How can a number line help you solve time word problems?

Description of Lesson (Including Instructional Strategies):

Anticipatory Set:

Review how to read time to the exact minute. Ask for strategies the students used to remember how to read time.

Application Problem (5 minutes)

Carlos gets to class at 9:08 a.m. He has to write down homework assignments and complete morning work before math begins at 9:30 a.m. How many minutes does Carlos have to complete his tasks before math begins?

Note: This problem provides context for the problems in the Concept Development.

Encourage students to discuss how they might solve using mental math strategies (e.g., count 9:18, 9:28 + 2 minutes, 2 + 20, 30 – 8)

Instruction and Strategies:

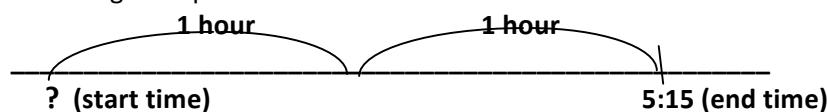
- Online Resource:
<https://learnzillion.com/resources/72357-solve-elapsed-time-word-problems-3-md-a-1>
- CITW Strategies: Setting Objectives and Providing Feedback, Non-Linguistic Representations, Cooperative Learning, Assigning Homework and Providing Practice
- Teach the students how to understand time word problems by first identifying the *givens* in the problem, i.e., the start time, the end time, and the change in time. Keep showing several problems and have them identify the givens and the unknown, without having to solve yet.
- Model how to work on each type of problem using an open number line and their clock models. Example:

Maria finished working on her homework at 5:15. If she worked for 2 hours and 5 minutes, what time did she start working?

Discussion Points: What is given in the problem? (the end time and elapsed time)

What is unknown? (the start time)

Modeling the open number line:



After they find the start hour by subtracting or counting back 2 hours, model that they have to subtract

5 minutes off the start hour as that is given in the problem. They could do this mentally or with their clock models.

- Once the students are firm with this prerequisite skill, model how to work on elapsed time word problems using the open number line and their clock models. (SMP #5) Marzano: Non-linguistic representation
 - Day 1: Elapsed Time Word Problems
 - Day 2: Finding the Start Time
 - Day 3: Finding the End Time
 - Days 4 and 5: Mixed

Guided Practice:

- After several examples, have the students work on a problem using their white boards, asking some questions to walk them through the problem. So what do we do first? Tell your partner, etc.
- Call on students to share their strategies and ask the class for feedback. (SMP #3)

Formative Assessment:

- At the tables, the students will be working on a problem with their partners first. The next two problems will be done independently, after which partners will compare answers, defending or justifying it as needed. Teacher walks around to monitor those who need further help.

Independent Practice:

- Give independent practice for the students who got the formative assessment while the teacher meets with the ones who did not get it for small group instruction.

Closure:

What did we learn today? Have a volunteer read the I Can statement for the day.

Accommodations/Modifications:

Students who are finding it hard to use the number line may be allowed to use only the model clocks.

Resources (Textbook and Supplemental): Guam District Curriculum Guide, LearnZillion.com, Engage NY, 3rd Grade Kansas Flipbook, Connecting Math Concepts

Reflection:

Content: Math	Grade/Course: 3 rd Grade	Timeline: Week 7
Standard/s: 3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.		
<p>Lesson Overview:</p> <p>Day 1: This standard introduces students to metric weight measured in kilograms and grams. They will build and decompose a kilogram to reason about the size and weight of 1 kilogram, 100 grams, 10 grams, and 1 gram.</p> <p>Day 2: Students learn to use digital scales as they explore these weights. They begin by holding a kilogram weight to kinesthetically understand its feel. Students use scales to measure the weight of objects precisely, and then use those measurements to solve one-step word problems given in the same units.</p> <p>Day 3: Students measure liquid volume in liters using beakers and the vertical number line. This experience lends itself to previewing the concept and language of rounding: students might estimate, for example, a given quantity as halfway between 1 and 2, or nearer to 2. Students use smaller containers to decompose 1 liter and reason about its size.</p>		<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> I can estimate liquid volumes and masses of objects using standard units of measure (grams, kilograms, and liters) I can measure liquid volumes and masses of objects using standard units of measure (grams, kilograms, and liters) I can use a drawing to represent one-step word problems involving masses or volumes. I can solve one-step word problems involving masses or volumes using addition, subtraction, multiplication, and division.
<p>Vocabulary: kilogram, gram, liter, volume, mass</p>	<p>Focus Question(s): How can knowing how to measure and estimate liquid volumes and masses of objects help us in real world situations?</p>	

Description of Lesson (Including Instructional Strategies):

Anticipatory Set:

Use a pan balance to make a bag of rice that weighs 1 kilogram.

T: Today we are going to explore a kilogram. It's a unit used to measure weight. (Write the word kilogram on the board.) Whisper kilogram to a partner.

S: Kilogram.

T: (Pass out a 1-kilogram bag of beans to each pair of students.) You are holding 1 kilogram of beans. To record 1 kilogram, we abbreviate the word kilogram by writing kg. (Write 1 kg on the board.) Read this weight to a partner.

Instruction and Strategies:

- Online Demo Lesson: <https://learnzillion.com/lessons/3899-find-the-volume-of-liquids>
- CITW Strategies: Setting Objectives and Providing Feedback, Non-Linguistic Representations, Cooperative Learning, Assigning Homework and Providing Practice
- Provide opportunities for students to use appropriate tools to measure and estimate liquid volumes in liters only and masses of objects in grams and kilograms. Students need practice in reading the scales on measuring tools since the markings may not always be in intervals of one. The scales may be marked in intervals of two, five or ten.
- Allow students to hold gram and kilogram weights in their hand to use as a benchmark. Use water colored with food coloring so that the water can be seen in a beaker.

- Students should estimate volumes and masses before actually finding the measuring. Show students a group containing the same kind of objects. Then, show them one of the objects and tell them its weight. Fill a container with more objects and ask students to estimate the weight of the objects. Use similar strategies with

liquid measures. Be sure that students have opportunities to pour liquids into different size containers to see how much liquid will be in certain whole liters.

- Show students containers and ask, "How many liters do you think will fill the container?" If making several estimates, students should make an estimate, then the measurement and continue the process of estimating measure rather than all estimates and then all measures. It is important to provide feedback to students on their estimates by using measurement as a way

Guided Practice:

- Provide different centers for the students to weigh different things such as rice, sugar, paper clips, etc. Have them record their findings on a record sheet.

Formative Assessment:

- Do the Student Debrief Part of the Lesson

Independent Practice:

- Exit Ticket/Quick Check

Closure:

Have the students answer the focus question (TPS) .

Accommodations/Modifications:

Have the students have separate models for 100 grams and 10 grams of rice in ziplock bags.

Resources (Textbook and Supplemental): Guam District Curriculum Guide, , Engage NY, 3rd Grade Kansas Flipbook, Learnzillion.com

Reflection:

Content: Math	Grade/Course: 3 rd Grade	Timeline: Week 8
Standard(s): 3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.		
Lesson Overview: This standard provides a context for students to work with fractions by measuring objects to a quarter of an inch. Students need many opportunities measuring the length of various objects in their environment Length measurement is an opportunity for students to physically explore the world around them. This standard also brings in the element of visual display which incorporates graphing and analyzing a data set.	Lesson Objective(s): I Can Statements: <ul style="list-style-type: none">• I can use a ruler to measure lengths in whole, half, and quarter inches• I can gather and record measurement data using whole, half, and quarter inches.• I can make a line plot with horizontal scale marked off in whole number, half, or quarter units.	
Vocabulary: inch, starting point, one half $\frac{1}{2}$, one quarter or one fourth $\frac{1}{4}$, line plot	Focus Question(s): How do I use my understanding of fractions in measuring lengths using a ruler?	

Description of Lesson (Including Instructional Strategies):**Anticipatory Set:**

Review how to show fractions on a whole and on a number line.

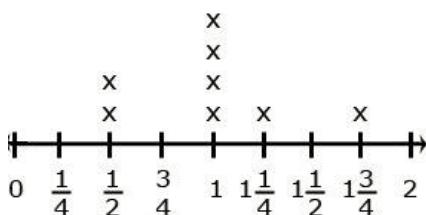
Present a number line from 0 to 1 and have the students show $\frac{1}{4}$ and $\frac{1}{2}$ on the number line.

Set the objective: “Today we are going to use this knowledge of finding $\frac{1}{2}$ and $\frac{1}{4}$ on the number line to measure length using a ruler.”

Instruction and Strategies:

- Online Resource: <https://learnzillion.com/resources/72234-generate-and-display-measurement-data-using-rulers-marked-with-halves-and-fourths-of-an-inch-3-md-b-4>
- Some important ideas related to measuring with a ruler are:
 - The starting point of where one places a ruler to begin measuring.
 - Measuring is approximate. Items that students measure will not always measure exactly $1/4$, $1/2$, or one whole inch. Students will need to decide on an appropriate estimate length.
 - Making paper rulers and folding to find the half and quarter marks will help students develop a stronger understanding of measuring length.
- Students should connect their understanding of fractions to measuring to one-half and one-quarter inch.
- Third-graders need many opportunities measuring the length of various objects in their environment.
Example:
Measure objects in your desk to the nearest $1/2$ or $1/4$ of an inch and display data collected on a line plot. How many objects measured $1/4$? $1/2$? etc.
Students generate data by measuring and creating a line plot to display their findings. Example:

Number of Objects Measured



- Note: For a demo of this lesson, please open this link:

<https://learnzillion.com/lessons/2773-measure-an-object-to-the-nearest-quarter-inch-using-a-ruler>

Guided Practice:

- Activity:

Measure objects in your desk to the nearest $\frac{1}{2}$ or $\frac{1}{4}$ of an inch and display data collected on a line plot. How many objects measured $\frac{1}{4}$? $\frac{1}{2}$? etc. (See graph example above)

Formative Assessment:

- Howard County Quick Checks on 3.MD.4

Independent Practice:

- Performance Tasks on measuring with a ruler and graphing data.

Closure:

Lesson Debrief:

Have the students answer the focus question.

Accommodations/Modifications:

Use paper rulers labeled with the fraction units as scaffold.

Resources (Textbook and Supplemental): Guam District Curriculum Guide, Howard County Common Core Math, Read Tennessee, learnzillion.com

Reflection:

Content: Math	Grade/Course: 3 rd Grade	Timeline: Week 6
Standard(s):		
3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.		
Lesson Overview:	Lesson Objective(s):	
This standard (3.MD.8) explores the concept of perimeter as being the distance around the outside of a particular object, as well as determine unknown side lengths when given. Students will understand the difference between perimeter and area; perimeter does not determine area and area does not determine perimeter. Students will master the ability to calculate the perimeter of an object by measuring all the sides of an object and adding those measurements together.	I Can Statements: <ul style="list-style-type: none"> • I can find the unknown side lengths of rectangles when given the perimeter and area • I can show how rectangles with the same perimeter can have different areas and show rectangles with the same area can have different perimeter. 	
Vocabulary: area, plane figure, square cm, square ft, square in., square m, square units, unit squares, equilateral, length, perimeter, polygon, quadrilateral	Focus Question(s): What is the difference between the perimeter and the area of a figure? What could you show or represent to convince me of this difference? How can an area change if you use a specific perimeter?	

Description of Lesson (Including Instructional Strategies):

Anticipatory Set:

Show a quadrilateral on the board divided into square units. Ask the students to find the area of the shape. Have students share the different strategies they used to find the area (e.g. counting all the squares, multiplying the number of the length and width.) Review the concept of area and how to find area. Give several other examples, emphasizing the units they should use as shown on the shape, e.g. square inches, square centimeters, square feet, etc.

Have the students sit around in a big rectangle. Put a string around several tiles on the floor to show a rectangle. Have the students count each line along the tiles as you walk around the rectangle. Then explain to them that the total number of lines that measured the distance you walked around the rectangle is called the *perimeter* of the rectangle. Have the students differentiate *perimeter* from *area*.

Instructional Strategies:

- **Online Resource:**
<https://learnzillion.com/resources/72611-solve-real-world-and-mathematical-problems-involving-perimeters-of-polygons-3-md-c-8>
- Students develop an understanding of the concept of perimeter by walking around the perimeter of a room, using rubber bands to represent the perimeter of a plane figure on a geoboard, or tracing around a shape on an interactive whiteboard. They find the perimeter of objects; use addition to find perimeters; and recognize the patterns that exist when finding the sum of the lengths and widths of rectangles. Given a perimeter and a length or width, students use objects or pictures to find the missing length or width. They justify and communicate their solutions using words, diagrams, pictures, numbers, and an interactive whiteboard.
- Students have created rectangles before when finding the area of rectangles and connecting them to using arrays in the multiplication of whole numbers. To explore finding the perimeter of a rectangle, have students

use non-stretchy string. They should measure the string and create a rectangle before cutting it into four pieces. Then, have students use four pieces of the non-stretchy string to make a rectangle. Two pieces of the string should be of the same length, and the other two pieces should have a different length that is the same. Students should be able to make the connection that perimeter is the total distance around the rectangle.

- Students use geoboards, tiles, graph paper, or technology to find all the possible rectangles with a given area.

Example: find the rectangles that have an area of 12 square units.

- Students record all the possibilities using dot or graph paper.
- Students compile the possibilities into an organized list or a table.
- Students determine whether they have all the possible rectangles.
- Students then investigate the perimeter of the rectangles with an area of 12.

- In the beginning, have students write the measurement above each side and then write an addition equation for calculation.
- Relate perimeter to real-life situations such as putting fence around an object or buying materials for a picture frame. The more ways students can see the application of this skill, the more ownership they will take in learning it.
- Students should have the opportunity to measure a variety of objects and then calculate the perimeter.
- Provide opportunities to find the side lengths of rectangles given only the perimeter and one side length, as well as rectangles with the same perimeter and different area, or rectangles with the same area and different perimeters.
- The use of manipulatives and technologies will help with students' understanding.

Guided Practice:

- Personal white board practice (whole class with teacher).
- Partner Practice in finding the area and perimeter of polygons.
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Formative Assessment:

- Worksheets on finding the area and perimeter.
- Do the Performance Task: Toothpick Activity with Cooperative Groups

Independent Practice:

- Quick Checks after the lesson
- Worksheets

Closure:

Do Team Talk or Think-Pair-Share to answer the Focus Questions at the end of the lesson cycle.

Accommodations/Modifications:

Provide the following: small group instruction for students who need extra support; Math Vocabulary with pictures to differentiate area and perimeter; multiplication table to support measurement of area

Resources (Textbook and Supplemental): Guam District Curriculum Guide, Howard County 3rd Grade Math, About Education.com, Read Tennessee, 3rd Grade Math Flipbook, The Teaching Channel

Reflection:

Content: Math	Grade/Course: 3 rd Grade	Timeline: Weeks 3-4
Standard(s): 3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.		
Lesson Overview: This lesson is focused on developing strategies to solve two-step word problems. Students need to be exposed to multiple problem-solving strategies (using any combination of words, models, numbers, diagrams, physical objects, or symbols) and be able to choose which ones to use. The size of the numbers should be limited to related third grade standards.		Lesson Objective(s): I Can Statements: <ul style="list-style-type: none"> • I can choose the correct operation to perform the first computation, and • I can choose the correct operation to perform the second computation in order to solve two-step word problems. • I can write equations using a letter for the unknown number. • I can decide if my answers are reasonable using mental math and estimation strategies including rounding.
Vocabulary: addition, estimation strategies, mental computation, commutative property over addition, associative property over addition, rounding, subtraction unknown variable		Focus Question(s): What are different ways to represent a given problem? What multiplication strategy might apply to a situation?

Description of Lesson (Including Instructional Strategies):

Anticipatory Set:

Present a two-step problem to the students. Challenge the class to solve it on their own. Then have them share their work with an elbow partner. Call on several students who used different strategies to present their solutions to the class using the document camera (if available). Then use the problem as a springboard to introduce the lesson and highlight how a problem can be solved using different strategies.

Instructional Strategies:

- **Online Resource:**
How to teach the standard: https://learnzillion.com/lesson_plans/8632-solving-two-step-word-problems-using-a-model#fndtn-lesson
- Students gain a full understanding of which operation to use in any given situation through contextual problems. Number skills and concepts are developed as students solve problems.
- The use of pictures and diagrams is an important tool to aid students with problem-solving and is also useful for justifying a particular answer.
- Problems should be presented on a regular basis as students work with numbers and computations. (Researchers and mathematics educators advise against providing “key words” for students to look for in problem situations because they can be misleading.)
- Students should use various strategies to solve problems. Students should analyze the structure of the problem to make sense of it. They should think through the problem and the meaning of the answer before attempting to solve it. (CITW: Identifying Similarities and Differences)
- Encourage students to represent the problem situation in a drawing or with counters or blocks. Students should determine the reasonableness of the solution to all problems using mental computations and estimation strategies. (CITW: Nonlinguistic Representations)
- Begin with word problems that promote more than one way to solve and encourage students to justify their thinking and be able to explain someone else’s way of solving the problem.

- When students solve word problems, they should use various estimation skills, which include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of solutions. (CITW: Generating and Testing Hypotheses)
- Estimation strategies include, but are not limited to:
 - Using benchmark numbers that are easy to compute
 - Front-end estimation with adjusting (using the highest place value and estimating from the front end making adjustments to the estimate by taking into account the remaining amounts)
 - Rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding changed the original values)

Formative Assessment:

- Students solve a given problem on their personal white boards
- Partner Practice/Team Huddle
- Quick Check

Independent Practice:

- Give several problem for independent practice.

Closure:

Have the students answer the focus questions after each lesson.

Accommodations/Modifications:

For students who need intensive support, give simpler problems with lower numbers.

Resources (Textbook and Supplemental): Guam District Curriculum Guide, Engage NY, Howard County, About Education.com, Read Tennessee, 3rd Grade Math Flipbook, <http://www.learnzillion.com>

Reflection: