

2.MD: MEASUREMENT & DATA

Cluster Statement: Work with time and money.

Supporting Cluster (Students should spend the large majority of their time (65-85%) on the major work of the grade/course. Supporting work and, where appropriate, additional work should be connected to and engage students in the major work of the grade.)

Standard Text

2.MD.C.7: Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Standard for Mathematical Practices

SMP 6: Students can attend to precision by using specific vocabulary to describe and tell time to the nearest five minutes.

SMP 7: Students can look for and make use of structure by understanding that there are 24 hours in each day consisting of two 12-hour cycles separated into a.m. and p.m.

Students who demonstrate understanding can:

- Explain the difference between a.m. and p.m. and identify activities appropriate for both.
- Read or say the time given a digital or analog clock (minutes displayed as a multiple of 5).
- Translate time on an analog clock to a digital clock and vice-versa, including drawing the appropriate hands on an analog clock (minutes displayed as a multiple of 5).
- Write the time and draw the appropriate hands on an analog clock when verbally told what time it is to the nearest 5 mi.
- Use specialized language such as half past, quarter after/past, quarter to, minutes after/past and minutes to when telling time.

Depth of Knowledge: 1

Bloom's Taxonomy:

Remember and Understand

<p>Standard Text</p> <p>2.MD.C.8: Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. <i>Example: If you have 2 dimes and 3 pennies, how many cents do you have?</i></p>	<p>Standard for Mathematical Practices</p> <p>SMP 1: Students can make sense of problems and persevere in solving them by interpreting what the information in a money word problem means and determining how to solve the problem.</p> <p>SMP 2: Students can reason abstractly and quantitatively by making sense of the value of the coins, e.g., three dimes and two pennies is thirty-two cents.</p> <p>SMP 7: Students can look for and make use of structure by interpreting the addition of mixed coins.</p>	<p>Students who demonstrate understanding can:</p> <ul style="list-style-type: none"> Identify and name dollar bills, quarters, dimes, nickels and pennies and their values. Solve word problems involving money. Use money symbols such as \$ and ¢ correctly. Show the same money value in different ways.
<p>Previous Learning Connections</p> <ul style="list-style-type: none"> Connect to telling time to the hour and half-hour using analog and digital clocks. (1.MD.3) 	<p>Current Learning Connections</p> <ul style="list-style-type: none"> Connect to skip count by 5s and 10s. (2.NBT.2) Connect to applying knowledge of one- and two-step word problems to a variety of contexts and domains, including money. (2.OA.1), (2.NBT.5) (2.MD.5) 	<p>Depth Of Knowledge: 2</p> <p>Bloom’s Taxonomy: Remember and Apply</p> <p>Future Learning Connections</p> <ul style="list-style-type: none"> Connect to telling and writing time to the nearest minute. (3.MD.1) Connect to solving word problems using all four operations with measurement quantities. (3.OA.3, 3.OA.8)
<p>Clarification Statement: The mathematics in this cluster focuses on telling time and solving word problems involving money. Students are introduced to time in 1st grade and they capstone their work with time in third grade.</p>		
<p>Common Misconceptions</p> <ul style="list-style-type: none"> Students might mix up the hour and minute hands. Students may not understand they need to “move” the hour hand when drawing the hands on an analog clock for a time other than “o’clock” (e.g., representing 2:00, 2:15, and 2:45 with the same hour hand). Students may focus on counting objects rather than value when working with coins. Students may believe that a larger coin has a larger value. Students may confuse using the \$ and ¢ symbols. 		

Multi-Layered System of Supports (MLSS)/Suggested Instructional Strategies

Pre-Teach

Pre-teach (targeted): *What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?*

- For example, some learners may benefit from targeted pre-teaching that uses images/resources (especially those being used the first time) when studying time and money. because money and clocks are items they have seen and have around them daily. Giving them connection and vocabulary will help them talk about the math they are doing.

Pre-teach (intensive): *What critical understandings will prepare students to access the mathematics for this cluster?*

- 1MD.B.3: This standard provides a foundation for work with time to the hour and half hour because students need to have an understanding of hour and minute hands so they can move from hour and half hour to now 5-minute intervals. If students have unfinished learning within this standard, based on assessment data, consider ways to provide intensive pre-teaching support prior to the start of the unit to ensure students are ready to access grade level instruction and assignments.

Core Instruction

Access

Physical Action: *How will the learning for students provide a variety of methods for navigation to support access?*

- For example, learners engaging with time and money benefit when learning experiences ensure information is accessible to learners through a variety of methods for navigation, such as physical manipulatives because math manipulatives make learning math interesting, fun, and enjoyable. Giving students the choice of working on money problem with hands-on coins is motivating while helping students learn.

Build

Effort and Persistence: *How will the learning for students provide options for sustaining effort and persistence?*

- For example, learners engaging with time and money benefit when learning experiences attend to students attention and affect to support sustained effort and concentration such as encouraging and supporting opportunities for peer interactions and supports (e.g., peer-tutors) because peer support increases student levels of self-esteem and allows them to take risks in their learning. It builds confidence and positive feelings that they are doing good work.

Language and Symbols: *How will the learning for students provide alternative representations to ensure accessibility, clarity and comprehensibility for all learners? (e.g., a graph illustrating the relationship between two variables may be informative to one learner and inaccessible or puzzling to another; picture or image may carry very different meanings for learners from differing cultural or familial backgrounds)*

- For example, learners engaging with time and money benefit when learning experiences attend to the linguistic and nonlinguistic representations of mathematics to ensure clarity can comprehensibility for all learners such as pre-teaching vocabulary and symbols, especially in ways that promote connection to the learners' experience and prior knowledge because if math language isn't explicitly taught, students learn to disregard math words and only pay attention to the numbers.

Expression and Communication: *How will the learning provide multiple modalities for students to easily express knowledge, ideas, and concepts in the learning environment?*

- For example, learners engaging with time and money benefit when learning experiences attend to the multiple ways students can express knowledge, ideas, and concepts such as using physical manipulatives (e.g., coins, bills, clocks) because physically interacting with materials by hand because using actual coins/clocks to solve money problems or tell time is more concrete and hands-on than looking at pictures or listening to a lecture.

Internalize

Comprehension: *How will the learning for students support transforming accessible information into usable knowledge, knowledge that is accessible for future learning and decision-making?*

- For example, learners engaging with time and money benefit when learning experiences attend to students by intentionally building connections to prior understandings and experiences; relating important information to the learning goals; providing a process for meaning making of new learning; and, applying learning to new contexts such as providing templates, graphic organizers, concept maps to support note-taking because visuals such as graphic organizers are a helpful learning tool for students of all ages to organize, clarify, or simplify complex information—they help students construct understanding through an exploration of the relationships between concepts. They also are a useful scaffold to support student learning.

Re-teach

Re-teach (targeted): *What formative assessment data (e.g., tasks, exit tickets, observations) will help identify content needing to be revisiting during a unit?*

- For example, students may benefit from re-engaging with content during a unit on time and money by providing specific feedback to students on their work through a short mini lesson because providing students with meaningful feedback can greatly enhance their learning and achievement. Re-teaching by providing students with information on what exactly they did well, and what may still need improvement.

Re-teach (intensive): *What assessment data will help identify content needing to be revisited for intensive interventions?*

- For example, some students may benefit from intensive extra time during and after a unit on time and money by confronting student misconceptions because students will shut down if they think they are doing it wrong. Focusing on the facts and why 'right is right' gives them the detailed steps again to follow to get the answer right. We help them and re-teach them until they get the steps right.

Extension

What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics developed within your HQIM?

- For example, some learners may benefit from an extension such as in-depth, self-directed exploration of self-selected topics when studying time and money because it gives students opportunities to teach themselves new skills of how to learn and apply to other content areas. Self-selected topics and learning can improve thinking skills, research skills, self-management skills, social skills, and communication skills and allows for further independent practice.

Culturally and Linguistically Responsive Instruction:

Validate/Affirm: How can you design your mathematics classroom to intentionally and purposefully legitimize the home culture and languages of students and reverse the negative stereotypes regarding the mathematical abilities of students of marginalized cultures and languages?

Build/Bridge: How can you create connections between the cultural and linguistic behaviors of your students' home culture and language the culture and language of school mathematics to support students in creating mathematical identities as capable mathematicians that can use mathematics within school and society?

Procedural Fluency from Conceptual Understanding: Instruction should build from conceptual understanding to allow students opportunities to make meaning of mathematics before focusing on procedures. When new learning begins with procedures it privileges those with strong prior familiarity with school mathematics procedures for solving problems and does not allow learning to build for more methods for solving tasks that occur outside of school mathematics. For example, when studying working with time and money the types of mathematical tasks are critical because students need real life experience engaging with money and time. They need practice looking at and talking about it within its everyday uses.

Standards Aligned Instructionally Embedded Formative Assessment Resources:

Source: <http://tasks.illustrativemathematics.org/content-standards/2/MD/C/8/tasks/1071>

This type of assessment question requires students to articulate their addition strategies and explain their thinking. SMP 4 model with mathematics is important as students apply the mathematics, they know to solve problems arising in everyday life.

This task allows you to assess students understanding of coins and their values, and addition of numbers equal to 100 or less. It will also assess their understanding of numbers and values when they show other ways to show the same value.

Relevance to families and communities:

During a unit focused on working with time and money, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students, for example, learning about the different ways money is used in the home and community can be a great way to connect schools tasks with home tasks. Creating opportunities for tasks such as open-ended money word problems which might involve a series of steps and representations including symbolism, graphs, and manipulatives (coin and clocks).

Cross-Curricular Connections:

Social Studies: In second grade the New Mexico Social Studies Standards state students should "sequence historical events". Consider providing a connection for students to look at the value of common household items in different years.

Language Arts: Literature can offer connections about measurement such as: *The Penny Pot* by Stuart J. Murphy and *The Clock Struck One* by Trudy Harris.