

Unpacked South Dakota State Mathematics Standards

Purpose: *In order for students to have the best chance of success, standards, assessment, curriculum resources, and instruction must be aligned in focus, coherence, and rigor. Unpacked standards documents are intended to help align instruction to the focus, coherence, and rigor of the South Dakota State Mathematics Standards. The standards have been organized in clusters as they are not so much built from topics, but rather woven out of progressions. Not all content in a given grade is emphasized equally in the mathematics standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. To say that some things have greater emphasis is not to say that anything in the standards can safely be neglected in instruction. Neglecting standards will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.*

Domain: Measurement and Data		Grade Level: 3
3.MD.A Cluster: Solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of object		
Students will tell, write, measure and estimate time to the nearest minute using analog and digital clocks. They will also solve word problems involving time intervals, liquid volume and masses of objects.		
<p>**This is a MAJOR cluster. <i>Students should spend the large majority of their time (65-85%) on the major work of the grade. Supporting work and, where appropriate, additional work should be connected to and engage students in the major work of the grade.</i></p> <p>3.MD.1. Tell and write time to the nearest minute and measure time intervals in minutes, using an analog and digital clock. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</p> <p>3.MD.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as cm^3 and finding the geometric volume of a container.) 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. (Excludes multiplicative comparison problems [problems involving notions of “times as much”; see Table, page 34])</p>		
Aspects of Rigor for Student Learning: (Conceptual, Procedural, and/or Application)		
Conceptual Understanding	Procedural Fluency	Application
<p>Learners will understand time to the nearest minute on an analog and digital clock. (3.MD.1)</p> <p>Learners will understand what time intervals are. (3.MD.1)</p>	<p>Learners will tell and write time to the nearest minute on analog and digital clock. (3.MD.1)</p> <p>Learners will calculate time intervals using a number line diagram. (3.MD.1)</p>	<p>Learners solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. (3.MD.1)</p>
<p>Learners will understand Metric Units (liter, gram and kilogram). (3.MD.2)</p> <p>Learners will understand the concept when a liquid takes up space it is measured by volume. (3.MD.2)</p> <p>Learners understand the concept of mass in relationship to weight. (3.MD.2)</p>	<p>Learners will measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (3.MD.2)</p> <p>Learners will 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</p>	<p>Learners will use the four operations to solve one-step word problems involving liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (3.MD.2)</p>

	drawings (such as a beaker with a measurement scale) to represent the problem. (3.MD.2)	
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Enacting the Mathematical Practices - Evidence of Students Engaging in the Practices

1. **Make sense of problems and persevere in solving them.**
 - Students will interpret analyze and solve word problems involving elapsed time, volume and mass.
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
 - Students will apply the mathematics they know to solve measurement word problems.
5. **Use appropriate tools strategically.**
 - Students will use estimation and measurement tools as they solve elapsed time, volume and mass word problems.
6. **Attend to precision.**
 - Students will attend to precision by using appropriate mathematical language.
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

Vertical and Horizontal Coherence and Learning Progressions

<u>Previous Learning Connections</u>	<u>Current Learning Connections</u>	<u>Future Learning Connections</u>
<p>In 2nd grade, learners tell and write time from analog and digital clocks to the nearest 5 minutes using AM and PM. (2.MD.7)</p>	<p>In 3rd grade, learners tell and write time to the nearest minute. They will measure time intervals, masses of objects and estimate liquid volume using standard units of measure and use number lines to solve word problems using time intervals to the minute.</p> <p><i>* Standards have been listed in this column to show progression of learning and how instruction correlates (a mutual relationship or connection, in which one thing affects or depends on another.) with the focus standard which is boldfaced.</i></p> <p>Learners 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 (3.MD.1)</p> <p>Learners understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$. (3.NF.1)</p> <p>Learners solve two-step word problems using the four operations.</p>	<p>In 4th grade, learners use the four operations to solve word problems involving distances, intervals of time, liquid volume, masses of objects and money including fractions and decimals.</p> <p>Learners know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), (4.MD.1)</p> <p>Learners multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. (4.OA.2)</p> <p>Learners use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and</p>

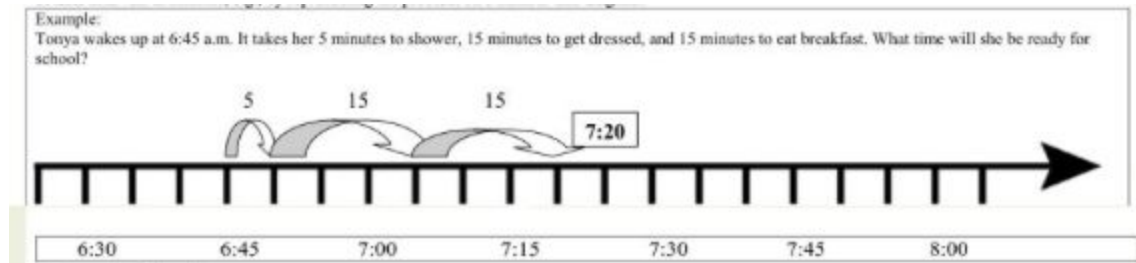
	<p>Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (3.OA.8)</p> <p>Learners measure and estimate liquid volumes and masses of objects using standard units 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 (3.MD.2)</p>	<p>money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. (4.MD.2)</p>
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Vocabulary (Key Terms Used by Teachers and Students in this Cluster):

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| <ul style="list-style-type: none"> ● Time <ul style="list-style-type: none"> ○ Nearest Minute ○ Time Intervals <ul style="list-style-type: none"> ■ Number line diagram ○ Analog Clock ○ Digital Clock | <ul style="list-style-type: none"> ● Liquid Volume ● Mass ● Estimate ● Measurement <ul style="list-style-type: none"> ○ Kilogram (kg), Grams (g), Liters (l) |
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Relevance, Explanations, and Examples:

Time Intervals on a Number Line Diagram



Achievement Level Descriptors

Cluster: Solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of object

Concepts and Procedures

Level 1 Students should be able to draw a picture graph and a bar graph to represent a data set with up to four categories; generate measurement data by measuring length using rulers marked with one-inch intervals; and create a line plot to represent a data set where the horizontal scale is marked in whole unit intervals.

Level 2 Students should be able to solve one-step "how many more?" and "how many less?" problems using information presented in picture and bar

	graphs; generate measurement data by measuring lengths using rulers marked with half-inch intervals; and represent measurement data on a line plot with a horizontal scale marked in half-unit intervals.
	Level 3 Students should be able to draw a scaled picture graph and a scaled bar graph to represent a data set; solve two-step "how many more?" and "how many less?" problems using information presented in a scaled bar graph; generate measurement data by measuring length using rulers marked with quarter-inch intervals; and create a line plot with a horizontal scale marked in quarter-unit intervals.
	Level 4