3rd Grade Math

ELG 3.MD.A: Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects

Vertical Progression:	
1st Grade	**1.MD.A Measure lengths indirectly and by iterating length units**. o **1.MD.A.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object. **1.MD.B Tell and write time.** o **1.MD.B.3** Tell and write time in hours and half-hours using analog and digital clocks.
2nd Grade	**2.MD.A Measure and estimate lengths in standard units.** o **2.MD.A.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. o **2.MD.A.3** Estimate lengths using units of inches, feet, centimeters, and meters. **2.MD.B Relate addition and subtraction to length.** o **2.MD.B.5** Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. o **2.MD.B.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram. **2.MD.C Work with time and money.** o **2.MD.C.7** Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
3rd Grade	**3.MD.A Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.** o **3.MD.A.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. o **3.MD.A.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.
4th Grade	**4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.** o **4.MD.A.1** 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. o **4.MD.A.2** Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and 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.

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Students will demonstrate command of the ELG by:

- Telling and writing time to the nearest minute using digital and analog clocks.
- Measuring time intervals in minutes.
- Solving word problems, including elapsed-time problems, using addition and subtraction of time intervals in minutes using number line diagrams.
- Measuring and estimating liquid volumes and masses of objects using standards units of grams (g), kilograms (kg), and liters (l) with appropriate tools.
- Using pictures and others models to add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes given in same units.
- Comparing estimates with actual measurements.

Vocabulary:

- analog clock
- digital clock
- elapsed time
- estimate
- gram (g)

- kilogram (kg)
- liquid volume
- liter (l)
- mass
- measure

- metric
- standard unit
- time intervals
- volume

Sample Instructional/Assessment Tasks:

1) **Standard: 3.MD.A.2**

Source: SBAC: Eligible Content for Summative Assessments

Item Prompt: Liquid Volume

Selina's teacher has a large container that holds 12 liters of water. He asks Selina to pour the water from that container into 6 smaller beakers for the class to use in a science lab. If Selina uses all of the water from the container and pours it in equal amounts into the 6 beakers, how much water should be in each beaker?

Draw a beaker and label it with units to show how much water will be in each beaker.

Write an equation to represent your work.

Correct Answer:

Possible correct equations: 12 ÷ 6 = 2 or 6 × 2 = 12 or 2 × 6 = 12
Teacher may want students to use a variable in the equation for the number 2 and then indicate n=2.

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2) **Standard: 3.MD.A.2**

Source: http://www.k-5mathteachingresources.com/support-files/weigh-it-twice.pdf

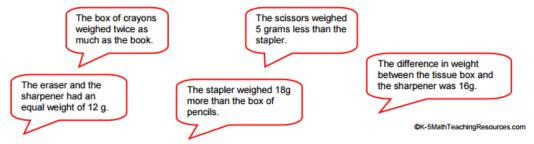**Item Prompt: Weigh it Twice**

Materials: balance scales, set of gram weights, paper clips, set of small objects

Weigh it Twice

Materials: balance scales, set of gram weights, paper clips, set of small objects
_____

1. Work with a partner. Select five small classroom objects to weigh on the balance scales.

2. Measure each object twice, first using paper clips and then using grams (g).

3. Record your findings in a three column table with the headings: Object, Non-Standard Unit (Paper Clips), Standard Unit (Grams)

4. Record three comparative statements about your data.

> The box of crayons weighed twice as much as the book.

> The scissors weighed 5 grams less than the stapler.

> The eraser and the sharpener had an equal weight of 12 g.

> The stapler weighed 18g more than the box of pencils.

> The difference in weight between the tissue box and the sharpener was 16g.

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Correct Answer:

Teacher should measure selected objects prior to having students do so in order to know approximates masses and foresee misconceptions and possible difficulties.

3) Standard: 3.MD.A.1

Source: https://www.engageny.org/resource/grade-3-mathematics-module-2-topic-lesson-5

Item Prompt: Elapsed time word problem

1. Arelli takes a short nap after school. As she falls asleep, the clock reads 3:03 p.m. She wakes up at the time shown below. How long is Arelli's nap?

Correct Answer: 27 minutes

2. Tessa spends 34 minutes washing her dog. It takes her 12 minutes to shampoo and rinse and the rest of the time to get the dog in the bathtub! How many minutes does Tessa spend getting her dog in the bathtub? Draw a number line to model the problem and write an equation to solve.

Correct answer: Tessa spends 22 minutes getting her dog in the bathtub.

Number line must include arrows at each end to show extension of time in both directions and labels. Students may show intervals of time by another multiple. Student's equation may be a missing addend equation.

Sample of student work:

2. Tessa spends 34 minutes washing her dog. It takes her 12 minutes to shampoo and rinse, and the rest of the time to get the dog in the bathtub! How many minutes does Tessa spend getting her dog in the bathtub? Draw a number line to model the problem and write an equation to solve.