LEAP Assessment Guide, Mathematics Grade 7

This guide includes:

I. Purpose of Assessment Guide

This document is designed to assist Louisiana educators in understanding the LEAP mathematics assessment for grade 7, which will be administered in spring 2016.

II. Introduction to LEAP

All students in grades 3–8 will take the LEAP ELA and mathematics assessments. In order for Louisiana to maintain comparability between assessments administered in spring 2015 and spring 2016, a percentage of the items (not more than 49.9%) for the LEAP assessments comes from the Partnership for Assessment of Readiness for College and Careers (PARCC). PARCC is a group of states working together to develop high-quality assessments. The remaining percentage of items for the LEAP assessments comes from the College and Career Readiness Item Bank belonging to Data Recognition Corporation, winner of the LEAP mathematics and ELA test development contract.

The LEAP assessments will offer the following:

- Consistency with the rigor and types of questions used in the spring 2015 Louisiana assessments
- Measurement of the full range of Louisiana content standards in ELA and mathematics
- Ability to measure the full range of student performance, including the performance of high- and low-performing students

- Flexibility in test administration, with both paper- and computer-based testing available
- Information for educators and parents about student readiness in ELA and mathematics and whether students are "on track" for college and careers
- Comparison of Louisiana student performance with the performance of students in other states

III. Overview of LEAP Mathematics Task Types and Reporting Categories

Each item on the LEAP assessment is referred to as a task and is identified by one of three types: Type I, Type II, and Type III. As shown in the table below, each of the three task types is aligned to one of four reporting categories (also called sub-claims): major content, additional and supporting content, reasoning, and modeling. Each task type is designed to align with at least one of the Standards for Mathematical Practice (MP).

Task Type	Description	Sub-Claim	Mathematical Practice(s)
Type I	conceptual understanding, fluency, and application	**Sub-Claim A:** solve problems involving the major content for grade 7 **Sub-Claim B:** solve problems involving the additional and supporting content for grade 7	can involve any or all practices
Type II	written arguments/ justifications, critique of reasoning, or precision in mathematical statements	**Sub-Claim C:** express mathematical reasoning by constructing mathematical arguments and critiques	primarily MP.3 and MP.6, but may also involve any of the other practices
Type III	modeling/application in a real-world context or scenario	**Sub-Claim D:** solve real-world problems engaging particularly in the modeling practice	primarily MP.4, but may also involve any of the other practices

These reporting categories are the same as the reporting categories on the spring 2015 mathematics student reports and will provide parents and educators valuable information about

- overall student performance, including readiness to continue further studies in mathematics;
- student performance broken down by mathematics subcategories, which may help identify when students need additional support or more challenging work; and
- how well schools and districts are helping students achieve higher expectations.

IV. Design of LEAP Mathematics Assessments

The LEAP mathematics assessment in grade 7 contains a total of 66 points. The table below shows the breakdown of task types and point values.

Grade 7 Mathematics Test Design				
Test Session	**Type I (points)**	**Type II (points)**	**Type III (points)**	**Total (points)**
Session 1: No Calculator	20	0	0	20
Session 2: Calculator	10	7	6	23
Session 3: Calculator	10	7	6	23

V. Assessable Content

The tasks on the LEAP mathematics test are aligned directly to the Louisiana Mathematics Standards for all sub-claims. Type I tasks, designed to assess conceptual understanding, fluency, and application, are aligned to the major content for grade 7 (reported in sub-claim A) and additional and supporting content for grade 7 (reported in sub-claim B). Type II tasks are designed to assess student reasoning ability of the major content for grade 7 in applied contexts (reported in sub-claim C). Type III tasks are designed to assess student modeling ability of selected content for grades 6 or 7 in applied contexts (reported in sub-claim D). Type II and III tasks are further aligned to PARCC evidence statements for sub-claims C and D. See the table in the Appendix (section VIII of this document) for a listing of assessable content of the Louisiana Mathematics Standards and PARCC evidence statements.

VI. LEAP Test Administration Policies

Administration Schedule

The spring LEAP ELA and mathematics assessments will be administered during **one** testing window and will be available to districts as paper-based tests (PBT) and computer-based tests (CBT). The table below lists the PBT administration schedule for the spring ELA, mathematics, and science assessments.

Paper–Based Test Administration Schedule: Grade 7		
Day 1 April 25	English Language Arts Session 1: Research Simulation Task	90 minutes
	Mathematics Session 1: No Calculator	75 minutes
Day 2 April 26	English Language Arts Session 2: Literary Analysis Task **OR** Narrative Writing Task + 1-2 passage sets	75 minutes
	Mathematics Session 2: Calculator	75 minutes
Day 3 April 27	English Language Arts Session 3: Reading Literary and Informational Texts	75 minutes
	Mathematics Session 3: Calculator	75 minutes
Day 4 April 28	Science Session 1: Multiple-Choice	Suggested time: 60 minutes
	Science Session 2: Task	Suggested time: 30 minutes
Day 5 April 29	Make–Up Sessions	Depends on session

The table below lists the CBT administration schedule and policies for the spring ELA and mathematics assessments.

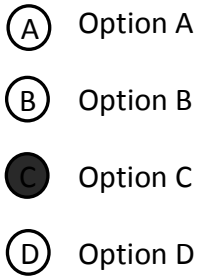
Computer-Based Test Administration Schedule: Grade 7		
Test Window: April 11, 2016 – May 6, 2016		
English Language Arts	Session 1: Research Simulation Task	90 minutes
Mathematics	Session 1: No Calculator	75 minutes
English Language Arts	Session 2: Literary Analysis Task **OR** Narrative Writing Task + 1-2 passage sets	75 minutes
Mathematics	Session 2: Calculator	75 minutes
English Language Arts	Session 3: Reading Literary and Informational Texts	75 minutes
Mathematics	Session 3: Calculator	75 minutes
Computer-Based Test Administration Policies: For the administration of the computer-based tests, schools must follow the policies below.		
• Sessions must be completed in the order listed above. • No more than two sessions can be scheduled per day (one English Language Arts and one Mathematics). • Students must be provided breaks between sessions. • All students in a particular grade must be tested on the same session at the same time as or as close to the same time as possible. If not possible, schools should have procedures in place to isolate students who have tested from those who are waiting to test. • Make-up sessions must be administered as soon as a student returns to school.		

The LEAP ELA and mathematics tests are **strictly timed** and no additional time is permitted, except for students who have a documented extended time accommodation (e.g., an IEP).

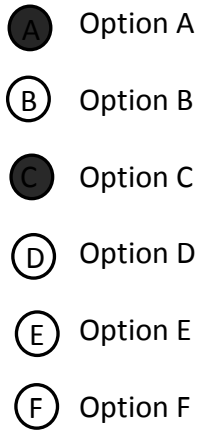
Paper-Based Tests

Students taking the paper-based tests, except those using braille test materials, will enter all answers in their test booklets. There will be no separate answer documents. Each session of the mathematics test booklet will be sealed; day indicator bars will appear on the outside margin of each page. Instructions for how to manage the test booklets, including how to break the seals, will be outlined in the Test Administration Manual.

Multiple-Choice tasks have four options. Students will shade the bubble of the correct answer.

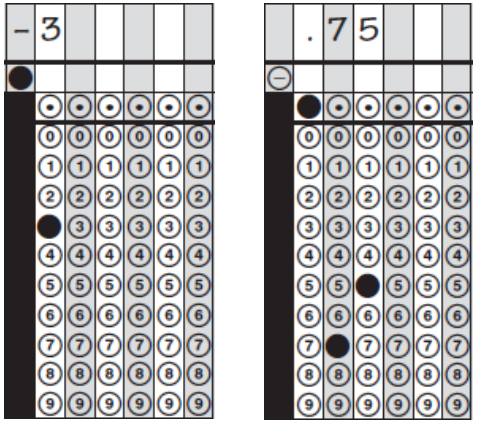


Multiple-Select tasks for grade 7 have five to seven options. Students will fill in the number of correct answers based on the question. The number of correct answers will vary from task to task.



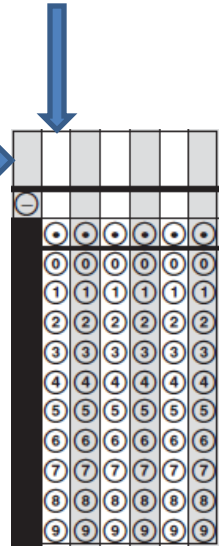
Fill-in-the-Blank Grids

The grid for grade 7 has a column for entering and shading a bubble when the answer is negative. See the example in the grid on the left below. Students will write the number in the boxes at the top of the grid. Numbers are entered **without** commas. Students will then shade the bubble in the column that corresponds to the entry in the top row. The recommended method for entry of the digits and a decimal point (if needed) is to start in column 2 as shown in the two examples on the left. Blank spaces within the answer are not allowed. Equivalent forms of numbers, such as 0.75 or 0.750 for .75 as shown in the second example, are accepted providing that the response fits within any rounding limits that may be required by the question. For example, if a question requires the response to be rounded to the hundredths place, 0.75 or .75 would be accepted as correct, whereas 0.750 would not be.



Enter digit or decimal point starting in column 2. Do not skip boxes when entering the number.

Use only if answer is a negative number.



Note: Should a student mistakenly start in a column other than column 2, the entry will be scored as correct under the following conditions:

- There are no spaces within the answer.
- The answer fits within the remaining columns.
- The negative symbol is used when the answer is a negative number.

Fractional Answers

Type I tasks with potential fractional answers in PBT forms will be presented in multiple-choice or multiple-select formats. Students will be expected to be able to correctly write and apply fractions in Type II (reasoning) and Type III (modeling) constructed-response tasks.

Answering Type II and Type III Tasks

When answering Type II (reasoning) and Type III (modeling) tasks, students need to make sure to write their explanations and/or to show their work in the box provided for each question. Any information written outside the box or which has been scratched out will not be scored.

The following information presents guidelines for marking/writing in the mathematics test booklet.

- Students may use yellow highlighters to highlight text in the test booklet.
- Students may write and do scratch work in the test booklet, but must avoid making stray marks in the answer circles on the multiple-choice and multiple-select tasks or in the fill-in-the-blank grids.
- Highlighting text in options and placing an X to the right of the text in an option are recommended ways for students to eliminate options. However, crossing out options could create scoring issues if students mark through answer circles.

Computer-Based Tests

Students taking the computer-based tests will enter their answers into the online testing system. The way each answer is entered depends on the task type. For example, for a multiple-choice task, a student will select the circle next to the correct answer. For fill-in-the-blank and constructed-response tasks on online test forms, students will type in the number (integer or decimal) or text in the box using the typing tools provided. Some response boxes limit the length of the response that can be typed and whether numbers and/or text can be typed.

Computer-based tests allow for the use of technology-enhanced items (TEI) that use innovative, engaging ways to assess student understanding of material beyond the limitations of a traditional selected-response task. A TEI may require the student to sort shapes into categories by using a drag-and-drop tool, show a fraction or an area by selecting cells in a figure, or create angles by rotating rays.

The computer-based tests include the following online tools, which allow a student to select answer choices, “mark” tasks, eliminate answer options, take notes, enlarge the task, guide the reading of a task line by line, use a calculator, use a ruler and protractor, see the mathematics reference sheet, and use an equation builder for entering special characters (similar to what a student can do on the paper-based tests). A help tool is also featured to assist students as they use the online system.

- Pointer tool 
- Highlighter tool 
- Cross-Off tool 
- Calculator 
- Sticky Note tool 
- Magnifying tool 
- Line Guide 
- Mathematics Reference Sheet 
- Measurement tools 
- Equation Builder 
- Help tool 

All students taking the computer-based tests should work through the Online Tools Training to practice using the online tools so they are well prepared to navigate the online testing system.

Permitted Testing Materials

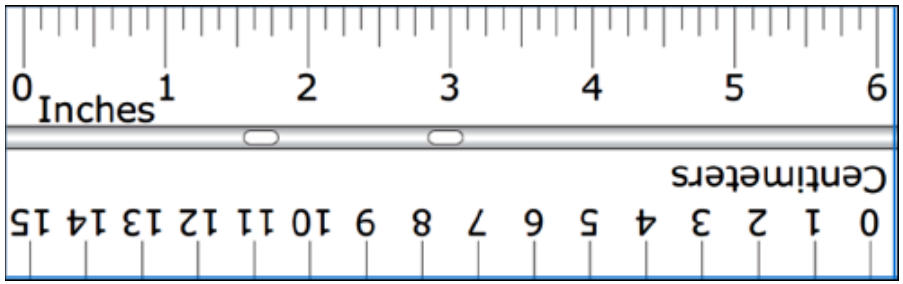
The chart that follows summarizes the tools and resources for the Grade 7 mathematics assessment.

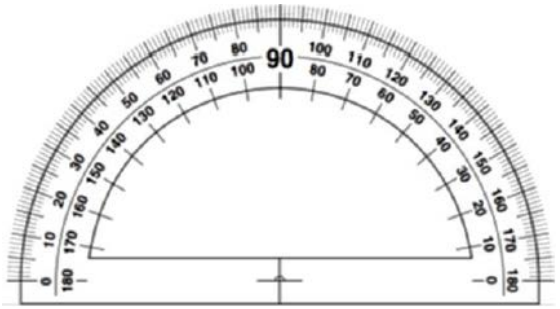
ASSESSMENT RESOURCES/TOOLS FOR GRADE 7

Provided (by vendor or part of online system)	Required (provided by school)	Other Allowable (may be used, not required)
$^1/_8$ -inch and centimeter ruler, protractor, and mathematics reference sheet	Scratch paper (lined, graph, or un-lined)	Yellow highlighter

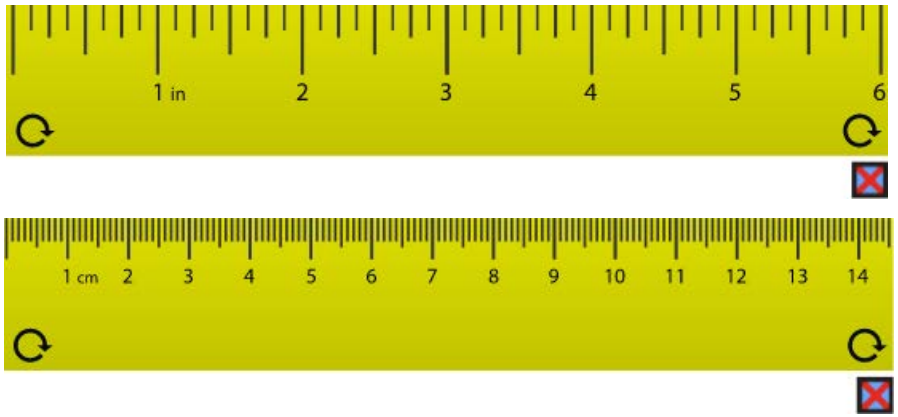
Provided tools are sent by the test vendor to the districts for the districts to distribute during testing; districts and students may **not** substitute their own tools for provided tools. Required tools must be supplied by the school and distributed to all testers during testing. Schools may give or permit students to bring *allowable* tools. If schools permit students to bring their own *allowable* tools, tools must be given to the test administrator prior to testing to ensure that the tools are appropriate for testing (e.g., tools do not have any writing on them).

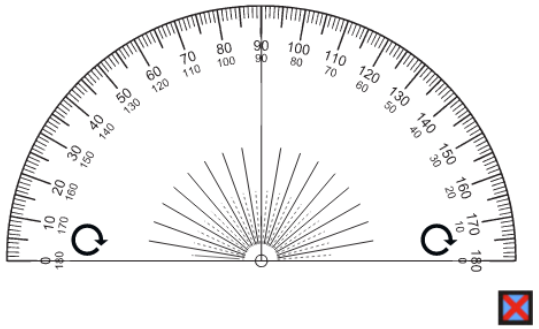
Grade 7 ruler and protractor provided on the LEAP paper-based mathematics assessment (not actual size):





Grade 7 rulers and protractor provided on the LEAP computer-based mathematics assessment (not actual size):





To ensure accurate measurement, the size of the computer-based ruler, along with the object being measured, varies depending on the computer monitor's resolution. To practice with the computer-based ruler and protractor, please visit the Online Tools Training.

Calculators

UPDATE: Clarification of Calculator Policy

The LEAP mathematics test allows a four-function calculator in grade 7 during Sessions 2 and 3. Calculators are **not** allowed during Session 1 of the test. Four-function calculators may have square root, percent, memory, and +/- keys. For students with the approved accommodation, a hand-held four-function calculator is allowed during all test sessions. The student should use the calculator they have used regularly throughout the school year in their classroom and are most familiar with, provided their regular-use calculator is not outside the boundaries of what is allowed. The following table includes calculator information by session for both general testers and testers with approved accommodations for calculator use.

Test Mode	**PBT**			**CBT**		
Session	Session 1	Session 2	Session 3	Session 1	Session 2	Session 3
Testers	Not allowed	Four-function, hand-held	Four-function, hand-held	Not allowed	Four-function, online available may also have hand-held	Four-function, online available may also have hand-held
Testers with approved accommodation for calculator use	Four-function, hand-held	Four-function, hand-held	Four-function, hand-held	Four-function, hand-held	Four-function, online available may also have hand-held	Four-function, online available may also have hand-held
Additional information for testers with approved accommodations for calculator use: • If a student needs an adaptive calculator (e.g., large key, talking), the student may bring his or her own or the school may provide one, as long as it is specified in his or her approved IEP or 504 Plan.						

Additionally, schools must adhere to the following guidance regarding calculators:

- Calculators with Computer Algebra System (CAS) features are **not** allowed.
- Tablet, laptop (or PDA), or phone-based calculators are **not** allowed.
- Students are **not** allowed to share calculators within a testing session.
- Test administrators must confirm that memory on all calculators has been cleared before and after the testing sessions.
- Calculators with "QWERTY" keyboards are **not** permitted.
- If schools or districts permit students to bring their own hand-held calculators, test administrators must confirm that the calculators meet all the requirements as defined above.

Reference Sheets

Students in grade 7 will be provided a reference sheet with the information below.

Grade 7 Reference Sheet

1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 5280 feet
1 mile = 1760 yards
1 mile = 1.609 kilometers

1 kilometer = 0.62 mile
1 pound = 16 ounces
1 pound = 0.454 kilogram
1 kilogram = 2.2 pounds
1 ton = 2000 pounds

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 gallon = 3.785 liters
1 liter = 0.264 gallon
1 liter = 1000 cubic centimeters

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$

Requisite Knowledge

Students in grade 7 will be required to know relative sizes of measurement units within one system of units. Therefore, the following requisite knowledge is necessary for the grade 7 assessments and is **not** provided in the reference sheet.

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters
1 kilogram = 1000 grams

1 gram = 1000 milligrams
1 liter = 1000 milliliters
1 foot = 12 inches
1 yard = 3 feet

1 day = 24 hours
1 minute = 60 seconds
1 hour = 60 minutes
Area formulas for rectangles

For more information about accessibility and accommodations, please refer to the 2015–2016 LEAP Accessibility Features and Accommodations Overview.

VII. Resources

UPDATE:
Links to More Resources

- Grades 6–8 Math Guidebook: offers comprehensive information to support teachers in creating yearly, unit, and daily instructional plans for students
- Grades 6–8 Math Teacher Library: provides links to grade-specific resources, such as the standards, shared teacher resources, and instructional plans
- EAGLE Sample Test Items: provides teachers a bank of questions that can be used for instructional and assessment purposes
- 2014–2015 Grade 7 Practice Test: provides teachers and students with additional tasks that are similar to the tasks on the 2016 test, but should not be administered as a "practice test" because test designs for 2015 and 2016 are not the same
- PARCC's Grade 7 Math Released Items: provides teachers and students with actual test items from the PARCC 2015 test, including rubrics, alignment, and scoring information
- 2015–2016 Grade 7 LEAP Practice Test and Scoring Guide: offers samples of paper-based grade-level practice tests to help prepare students for the spring assessments
- 2015-2016 Grade 7 Online LEAP Practice Test, Scoring Guide, and Answer Key: offers samples of computer-based grade-level practice tests to help prepare students for the spring assessments; the online practice test is accessed through INSIGHT
- Online Tools Training: provides teachers and students examples of interactive, technology-enhanced items so they can become familiar with the computer-based testing format
- 2015–2016 LEAP Accessibility Features and Accommodations Overview: provides an overview of Louisiana's accessibility features and accommodations for grades 3–8 spring 2016 testing, clarifying differences between paper-based and online testing
- 2015-2016 LEAP Mathematics Practice Test Guidance: provides teachers with information about test structure, recommended uses, general cautions, item types, and scoring of the paper-based and computer-based LEAP tests
- Guide to the LEAP Online Equation Builder Grades 6-8: provides teachers with information on using the equation builder within the open-response boxes on the CBT
- Guide to Administering the Online Practice Tests: provides information regarding the administration and scoring process needed for the online practice tests

VIII. Appendix

Assessable Content for Sub-Claim A (Major Content)

Sub-Claim A: Major Content	
7.RP.A	**Analyze proportional relationships and use them to solve real-world and mathematical problems.**
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.*
7.RP.A.2	Recognize and represent proportional relationships between quantities. 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. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn*. d. 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.A.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.
7.NS.A	**Apply and extend previous understandings of operations with fractions.**
7.NS.A.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged*. b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.[1]
7.EE.A	**Use properties of operations to generate equivalent expressions.**

[1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*
7.EE.B	**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
7.EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation*.
7.EE.B.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions*.

Assessable Content for Sub-Claim B (Additional and Supporting Content)

Sub-Claim B: Additional and Supporting Content	
7.G.A	**Draw construct, and describe geometrical figures and describe the relationships between them.**
7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
7.G.A.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.A.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.G.B	**Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
7.SP.A	**Use random sampling to draw inferences about a population.**
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be*.
7.SP.B	**Draw informal comparative inferences about two populations.**
7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable*.
7.SP.B.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book*.
7.SP.C	**Investigate chance processes and develop, use, and evaluate probability models.**
7.SP.C.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
7.SP.C.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times*.
7.SP.C.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected*. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*
7.SP.C.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

Assessable Content for Sub-Claim C (Reasoning Applications)

Sub-Claim C: Reasoning Applications
Base explanations/reasoning on the properties of operations. Content Scope: Knowledge and skills articulated in • 7.NS.A.1, 7.NS.A.2 – Students need not use property names. • 7.EE.A.1 – Students need not use property names.
Base explanations/reasoning on the relationship between addition and subtraction or the relationship between multiplication and division. Content Scope: Knowledge and skills articulated in • 7.NS.A.1, 7.NS.A.2
Base explanations/reasoning on a number line diagram (whether provided in the prompt or constructed by the student in her response). Content Scope: Knowledge and skills articulated in • 7.NS.A
Base explanations/reasoning on a coordinate plane diagram (whether provided in the prompt or constructed by the student in her response). Content Scope: Knowledge and skills articulated in • 7.RP.A – Tasks are limited to coordinates in Quadrant 1 and a positive constant of proportionality.
Given an equation, present the solution steps as a logical argument that concludes with the set of solutions (if any). Content Scope: Knowledge and skills articulated in • 7.EE.B.4a
Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. Content Scope: Knowledge and skills articulated in • 7.RP.A.2 – Tasks are limited to coordinates in Quadrant 1 and a positive constant of proportionality. • 6.NS.C, 6.EE.A, 6.EE.B – Tasks may have scaffolding.[2]
Present solutions to multi-step problems in the form of valid chains of reasoning, using symbols such as equals signs appropriately (for example, rubrics award less than full credit for the presence of nonsense statements such as 1 + 4 = 5 + 7 = 12, even if the final answer is correct), or identify or describe errors in solutions to multi-step problems and present corrected solutions. Content Scope: Knowledge and skills articulated in • 7.RP.A.3 – Tasks are limited to coordinates in Quadrant 1 and a positive constant of proportionality. • 7.NS.A.2d - Tasks focus on demonstrating understanding that a number is rational and do not directly assess the ability to divide two whole numbers. • 7.NS.A.3 • 7.EE.B.3

[2] Scaffolding in a task provides the student with an entry point into a pathway for solving a problem. In unscaffolded tasks, the student determines his/her own pathway and process. Both scaffolded and unscaffolded tasks will be included in reasoning and modeling items.

Assessable Content for Sub-Claim D (Modeling Applications)

Sub-Claim D: Modeling Applications
Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 7, requiring application of knowledge and skills articulated in Sub-claim A[3]. Tasks may have scaffolding.[2] Tasks involving writing or solving an equation should not go beyond the equation types described in 7.EE.4a ($px+q=r$ and $p(x+q)=r$ where p, q, and r are specific rational numbers).
Solve multi-step contextual problems with degree of difficulty appropriate to grade 7, requiring application of knowledge and skills articulated in 6.RP.A, 6.EE.C, 6.G. Tasks may have scaffolding.[2]
Micro-models: Autonomously apply a technique from pure mathematics to a real-world situation in which the technique yields valuable results even though it is obviously not applicable in a strict mathematical sense (e.g., profitably applying proportional relationships to a phenomenon that is obviously nonlinear or statistical in nature) requiring knowledge and skills articulated in Sub-claim A.[3] Tasks may have scaffolding.[2]
Reasoned estimates: Use reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity requiring knowledge and skills articulated in Sub-claim A.[3] Tasks may have scaffolding.[2]

[3] Standard 7.NS.A.2d is not assessed in Modeling.