LOUISIANA DEPARTMENT OF EDUCATION

Office of Assessments, Accountability, and Analytics

LEAP Assessment Guide for Grade 5 Mathematics

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Purpose

This document is designed to assist Louisiana educators in understanding the LEAP Grade 5 Mathematics assessment.

Introduction

All students in grades 3–8, Algebra I, and Geometry will take the LEAP assessments, which provide

- questions that have been reviewed by Louisiana educators to ensure their alignment to the K-12 Louisiana Student Standards for Mathematics and appropriateness for all Louisiana students;
- measurement of the full range of student performance; and
- information for educators and parents about student readiness in mathematics and whether students are “on track” for college and careers.

Vision for Mathematics Standards and Assessment

Students in Louisiana are ready for college or a career if they are able to meet college and workplace expectations without needing remediation in mathematics skills and concepts. The K-12 Louisiana Student Standards for Mathematics support students to become mathematically proficient by focusing on three components of rigor: conceptual understanding, procedural skill and fluency, and application.

- **Conceptual understanding** refers to understanding mathematical concepts, operations, and relations. It is more than knowing isolated facts and methods. Students should be able to make sense of why a mathematical idea is important and the kinds of contexts in which it is useful. It also allows students to connect prior knowledge to new ideas and concepts.
- **Procedural skill and fluency** is the ability to apply procedures accurately, efficiently, and flexibly. It requires speed and accuracy in calculation while giving students opportunities to practice basic skills. Students' ability to solve more complex application tasks is dependent on procedural skill and fluency.
- **Application** provides a valuable context for learning and the opportunity to solve problems in a relevant and a meaningful way. It is through real-world application that students learn to select an efficient method to find a solution, determine whether the solution(s) makes sense by reasoning, and develop critical thinking skills.

Assessment Design

Supporting Mathematics Instruction

The LEAP mathematics assessments focus on testing the LSSM according to the components of rigor reflected in high-quality mathematics instructional materials that

- require students to demonstrate understanding of mathematical reasoning in mathematical and applied contexts;
- assess accurate, efficient, and flexible application of procedures and algorithms;
- rely on application of procedural skill and fluency to solve complex problems; and
- require students to demonstrate mathematical reasoning and modeling in real-world contexts.

Assessable Content

Each item on the LEAP

mathematics assessments is referred to as a task and is identified by one of three types: Type I, Type II, or Type III. All task types are aligned directly to the K-12 Louisiana Student Standards for Mathematics. Type I tasks are further aligned to LEAP mathematics evidence statements for the Major Content and Additional & Supporting reporting categories and allow for the testing of more than one of the student

standards on a single task. Type II and III tasks are further aligned to LEAP mathematics evidence statements for the Mathematical Reasoning & Modeling reporting category.

- **Type I tasks** are designed to assess conceptual understanding, fluency, and application, and are aligned to the major, additional, and supporting content for the grade or course.
- **Type II tasks** are designed to assess student reasoning ability of selected content in applied contexts.
- **Type III tasks** are designed to assess student modeling ability of selected content in applied contexts.

LEAP Mathematics Evidence Statements

LEAP mathematics evidence statements are labeled to include the task type (I, II, or III) and the grade (3, 4, 5, 6, 7, or 8) or course (A1 or GM). LEAP evidence statements for grade 5 are labeled as "LEAP.I.5.#" for Type I tasks, "LEAP.II.5.#" for Type II tasks, and "LEAP.III.5.#" for Type III tasks. See the table in Appendix A for a listing of assessable content of the LSSM and LEAP mathematics evidence statements.

Item Types

All of the item types below will appear on the test.

- Multiple-Choice (MC) – This item type asks students to choose one correct answer and may appear as a one-part question, as part of a two-part question, or as a part of a CR item. The MC items are worth one point.

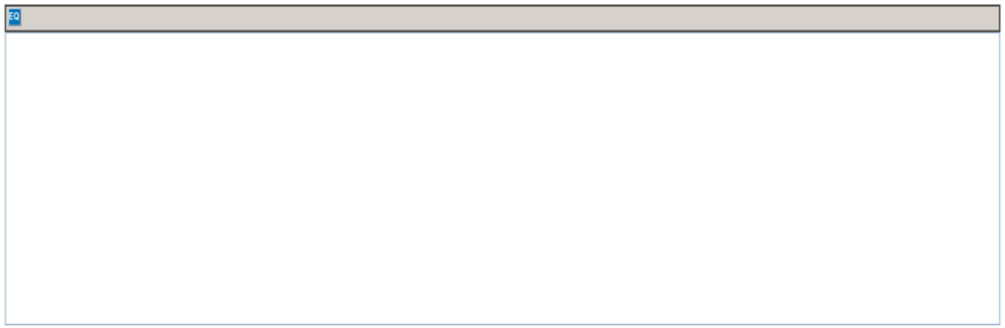
- Multiple-Select (MS) – This item type asks students to choose **more than one** correct answer and may appear as a one-part question, as part of a two-part question, or as a part of a CR item. Whenever this item type is used, the question **always identifies** in boldface print the number of correct answers required. The MS items are worth one point. Students must choose **all correct answers and no incorrect** answer must be chosen to receive credit.

- Short Answer (SA) – This item type asks students to key numeric answers into an entry box using the keyboard and may appear as a one-part question, as part of a two-part question, or as a part of a CR item. The SA items are worth one point. Unless specified in the question, a student will earn credit for an answer that is equivalent to the correct numerical answer. For the Grade 5 Math assessment, answers to SA items must be entered as whole numbers or in decimal form.

- Keypad Input (KI) – This item type asks students to key numeric or algebraic answers in the form of fractions, mixed numbers, expressions, equations, or inequalities. This item type may appear as a one-part question, as part of a two-part question, or as a part of a constructed-response item. The KI items are worth one point. Unless specified in the question, a student will earn credit for an answer that is equivalent to the correct numeric or algebraic response.

- Technology-Enhanced (TE) – This item type uses technology to capture student responses. TE items may appear as a one-part question, as part of a two-part question, or as a part of a CR item. The TE items are worth one point. The Online Tools Training (OTT) allows students to practice answering the TE questions. For a summary of the different styles of technology-enhanced items refer to the LEAP Technology-Enhanced Item Types document.

- Constructed Response (CR) – This item type can be a single- or multi-part item. CR items ask students to create a written explanation or justification, model a process, and/or compute an answer to earn a series of points. A student may receive partial or full credit on CR items and maximum point values will vary by CR task. Maximum values for CR items are 3, 4, or 6 points. When responding to a CR item, students will type their responses into a response box.



Response Box

The response box allows students to use the keyboard to type in their response or work. There is a limit to the number of characters that can be typed into the response box; however, it is set well beyond what a student might produce based on grade-specific expectations of the item. The toolbar at the top of the response box has the Equation Builder tool that allows the students to create a response with commonly used grade-specific mathematical symbols.

Equation Builder

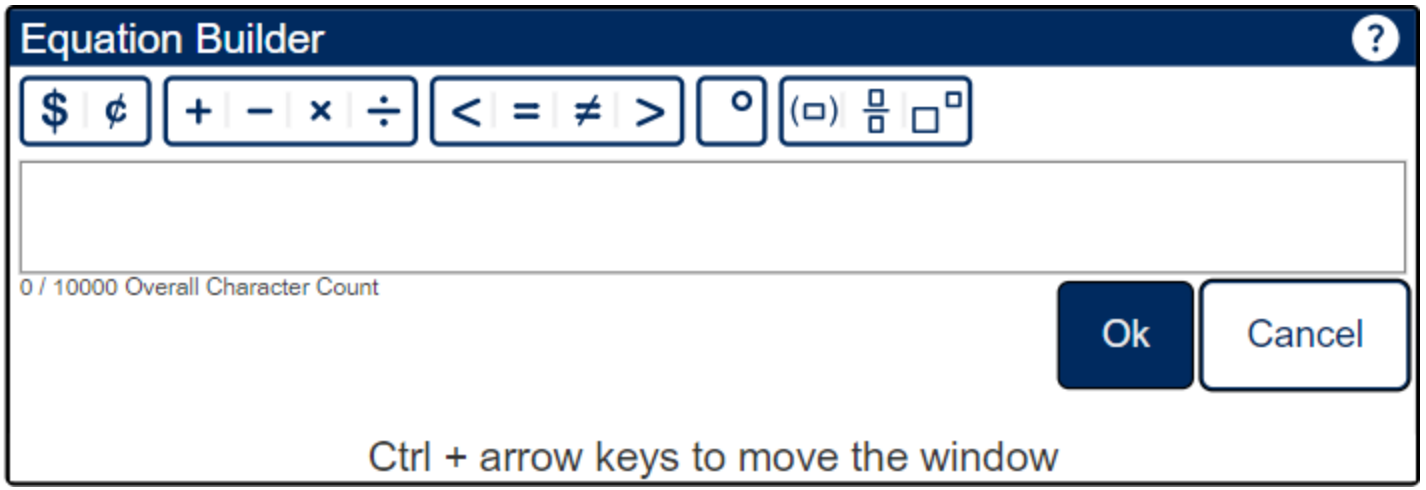
Students are not required to use the equation builder for any symbols that are also available on the keyboard.

For example, students may use a slash, forward / or back \, to represent a fraction, a carat ^ to represent exponents, or a dash – to represent subtraction. The degree ° and cents ¢ symbols are not available on the keyboard, but students may type the words “degrees” and “cents” as necessary.

The Equation Builder does not include all symbols/characters students might need to type into the open response box. Students should know how to type a question mark ?, brackets [ ], and a colon : using the keyboard.

Using the Equation Builder

- To enter text, click the pointer in the **Response Box** and type text using the keyboard.
- Click on the **Equation Builder** button to open the tool and enter any mathematical symbols, characters, or format.
- When finished, click on the **OK** button in the lower-right corner of the Equation Builder tool – the equation will be entered into the response box.
- To cancel what you have entered, click on the **Cancel** button in the lower-right corner of the Equation Builder tool and you will be returned to the response box.
- To edit an existing equation, double-click on the equation in the Response Box. This will re-open the Equation Builder.



Test Design

The LEAP mathematics assessment in grade 5 contains a total of 37 tasks for 52 points. The table below shows the breakdown of the number of tasks and point values by Reporting Category and Session. The LEAP mathematics test is **timed**. No additional time is permitted, except for students who have a documented extended time accommodation (e.g., an IEP).

Reporting Category	Session 1		Session 2		Session 3		Total	
	Tasks	Points	Tasks	Points	Tasks	Points	Tasks	Points
A - Major Content	8-9	9	7-9	9	9	9	24-27	27
B - Additional & Supporting Content	3-4	4	2-3	3	2	2	7-9	9
C - Mathematical Reasoning & Modeling	1	4	1	6	2	6	4	16
Total Operational	13	17	11	18	13	17	37	52
Total Field-Test	1-2	N/A	1	N/A	1-2	N/A	3-5	N/A
Session Time	65 minutes		65 minutes		65 minutes		195 minutes	

Note: The test contains field-test tasks, which **do not** count toward the test score; they provide information that will be used to develop future test forms.

The following table includes information on the total tasks, total points, and percentage of assessment points by task-type point-values.

Task Types	Point Values	Total Tasks	Total Points		Percentage of Points	
Type I	1-point	30	30	36	58%	70%
	2-point	3	6		11.5%	
Type II	3-point	1	3	7	6%	13%
	4-point	1	4		7%	
Type III	3-point	1	3	9	6%	17%
	6-point	1	6		11.5%	
Total		37	52		100%	

Reporting Categories

Each of the three task types is aligned to one of three reporting categories: Major Content, Additional & Supporting Content, or Mathematical Reasoning & Modeling. Each task type is designed to align with at least one of the Louisiana Student Standards for Mathematical Practice (MP), found on pages 6-8 in the K-12 Louisiana Student Standards for Mathematics.

Task Type	Description	Reporting Category	Mathematical Practice
Type I	conceptual understanding, fluency, application	**A - Major Content:** solve problems involving the major content for grade 5 **B - Additional & Supporting Content:** solve problems involving the additional and supporting content for grade 5	may align with any or all practices
Type II	written argument/justification, critique of reasoning/precision in mathematical statements	**C - Mathematical Reasoning & Modeling:** express mathematical reasoning by constructing mathematical arguments and critiques; solve real-world problems engaging particularly in the modeling practice	primarily MP.3, MP. 4, and MP.6, but may also involve any of the other practices
Type III	modeling or application in a real-world context		

The Major Content reporting category is divided, based on Achievement Level Descriptors, into the following subcategories.

Subcategory	LSSM and LEAP Mathematics Evidence Statements	Description
Operations with Decimals/Read, Write, and Compare Decimals	5.NBT.A.3, 5.NBT.A.4, 5.NBT.B.7	Students solve mathematical problems using the four operations with decimals to hundredths. Students read, write, compare, and round decimals.
Solve Fraction Problems	5.NF.A.1, 5.NF.A.2, 5.NF.B.4, 5.NF.B.6, 5.NF.B.7	Students create and solve mathematical and world problems using the four operations with fractions.
Interpret Fractions, Place Value, and Scaling	5.NF.B.3, 5.NF.B.5a, 5.NBT.A.1, 5.NBT.A.2, LEAP.I.5.1	Students interpret the fraction as division and multiplication by comparing size of the product with its factors. Students compare the digits of products, quotients, or multi-digit numbers using place value and patterns within powers of 10.
Recognize, Represent, and Determine Volume/Multiply and Divide Whole Numbers	5.MD.C.3, 5.MD.C.4, 5.MD.C.5b, 5.MD.C.5c, 5.NBT.B.5, 5.NBT.B.6	Students solve mathematical problems involving multiplication and division of multi-digit whole numbers. Students understand the concept of volume and determine volume using various strategies.

These reporting categories 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 content and practices, which may help identify when students need additional support or more challenging work;
- student performance in Major Content broken down by content subcategories, which may help teachers and schools hone in on specific content for professional development; and
- how well schools and schools systems are helping students achieve higher expectations.

Achievement-Level Definitions

Achievement-level definitions briefly describe the expectations for student performance at each of Louisiana's five achievement levels:

- **Advanced:** Students performing at this level have **exceeded** college and career readiness expectations and are well prepared for the next level of study in this content area.
- **Mastery:** Students performing at this level have **met** college and career readiness expectations and are prepared for the next level of study in this content area.
- **Basic:** Students performing at this level have **nearly met** college and career readiness expectations and may need additional support to be fully prepared for the next level of study in this content area.
- **Approaching Basic:** Students performing at this level have **partially met** college and career readiness expectations and will need much support to be prepared for the next level of study in this content area.
- **Unsatisfactory:** Students performing at this level have **not yet met** the college and career readiness expectations and will need extensive support to be prepared for the next level of study in this content area.

Achievement Level Descriptors

Achievement Level Descriptors (ALDs) indicate what a typical student at each level should be able to demonstrate based on his or her command of grade-level standards. ALDs are written for the four assessment reporting categories. Access the ALDs in the Assessment Resources Webpage for a breakdown of the knowledge, skills, and practices associated with each achievement level.

Test Administration

Administration Information

The testing window opens April 1, 2027, and runs through May 12, 2027 for all computer-based tests. The school or district test coordinator will communicate each school's testing schedule. For updates to the testing schedule, refer to the 2026-2027 Louisiana Assessment Calendar. All LEAP assessments are **timed**. No additional time is permitted, except for students who have a documented extended time accommodation (e.g., an IEP).

Scheduling Requirements for Computer-Based Testing

Computer-based testing allows school systems some flexibility in scheduling. However, to reduce incidences of testing irregularities, school systems **must** adhere to the following scheduling and administration practices:

- Testing students in the same grade level across the school at or very close to the same time
- Completing makeup testing for students immediately upon their return
- Limiting student interaction during breaks between test sessions
- Isolating students who have not completed testing for the day (e.g., students with extended time accommodation)
- Preventing interaction between groups of students taking the same tests at different times within a testing day
- Requiring the completion of a session once it is opened (i.e., limiting the reopening of test sessions)
- Taking the sessions within a content area in the correct order (e.g., Math Session 1 taken before Math Session 2)

The following is also recommended:

- Limiting sessions to no more than three in one day for a student

For more information about scheduling and administration policies, refer to the Online Assessment Scheduling Guidance, found in the LDOE Assessment Resources Webpage.

Spanish Mathematics Guidelines

Spanish-language versions of the LEAP mathematics assessments are available as an accommodation for Spanish-speaking English learners. The following guidelines should be used when assigning a student to a Spanish-language mathematics assessment. The student should meet at least one of the following criteria:

- student whose primary language is Spanish and who receives instruction in Spanish
- student who is a recently arrived EL and had prior instruction in mathematics in Spanish
- student who is enrolled in a dual-language immersion program that includes mathematics taught in Spanish

Consideration of the following is strongly urged when deciding which version of the mathematics assessment form (i.e., English-language or Spanish-language version) is best for a Spanish-speaking student.

- The language in which a student receives instruction affects their performance.
- A Spanish-speaking student who is not receiving instruction in Spanish may not have knowledge of math-specific terms translated to Spanish.
- A Spanish-speaking student may not have the literacy skills required to read in Spanish (speaking Spanish is not the same as reading Spanish).

If a teacher is unsure whether the Spanish-language version is appropriate for a specific student, it is recommended that the student take one session of the LEAP mathematics practice test in English and one session in Spanish in order to determine the language in which the student is most comfortable.

Testing Materials

The chart that follows summarizes the tools and resources for the grade 5 mathematics assessment.

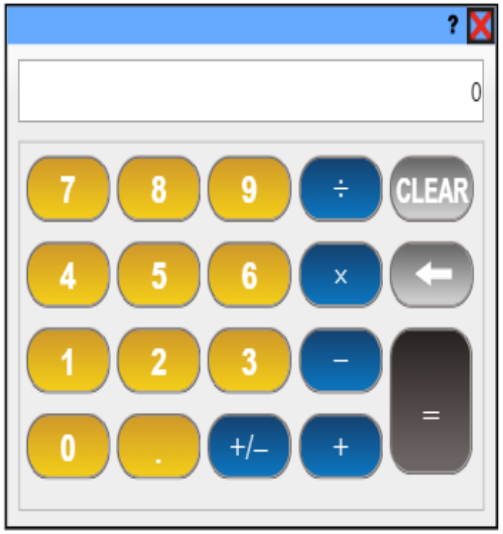
Tools	Provided	Guidelines
scratch paper (lined, graph, unlined), two pencils	by Test Administrator	• All tools available for all sessions • Reference sheets may be printed from the DRC Insight Portal (eDIRECT) • Tools provided by Test Administrator must not be written on
$\frac{1}{8}$—inch ruler, centimeter ruler, and protractor	online	
Grade 5 Mathematics Reference Sheet	online and/or by Test Administrator	

Calculator Policy

Students are **not** allowed to use calculators during the administration of any mathematics test in grades three through five.

For students with the approved accommodation for calculator use, a four-function calculator must be provided for all sessions.

- Square root, percent, memory, and +/- keys are also allowed, but not required.
- An online calculator (shown) will be available for all sessions, but a hand-held calculator is allowed.
- 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 IAP.
- Calculators with the following features are **not** permitted:
    - Computer Algebra System (CAS) features
    - "QWERTY" keyboards
    - paper tape
    - talk or make noise, unless specified in IEP/IAP
    - tablet, laptop (or PDA), phone-based, or wristwatch
- 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.



- 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, as detailed above.
- If schools or school systems permit students to bring their own hand-held calculators, test administrators must confirm that the calculators meet all the requirements as defined above.

Reference Sheet

Students in Grade 5 will be provided a reference sheet with the information shown. The Grade 5 Mathematics Reference Sheet may be printed from the DRC Insight Portal (eDirect) or found in the Assessment Guidance webpage on page 1 of LEAP Grades 5-HS Mathematics Reference Sheets.

- 1 mile = 5280 feet
- 1 mile = 1760 yards
- 1 pound = 16 ounces
- 1 ton = 2000 pounds
- 1 cup = 8 fluid ounces
- 1 pint = 2 cups
- 1 quart = 2 pints
- 1 gallon = 4 quarts
- 1 liter = 1000 cubic cm

Right Rectangular Prism	$V = B \times h \text{ or } V = l \times w \times h$

Students in grade 5 will be required to know relative sizes of measurement units within one system of units. Therefore, the listed requisite knowledge is necessary for the grade 5 assessments and is not provided in the reference sheet.

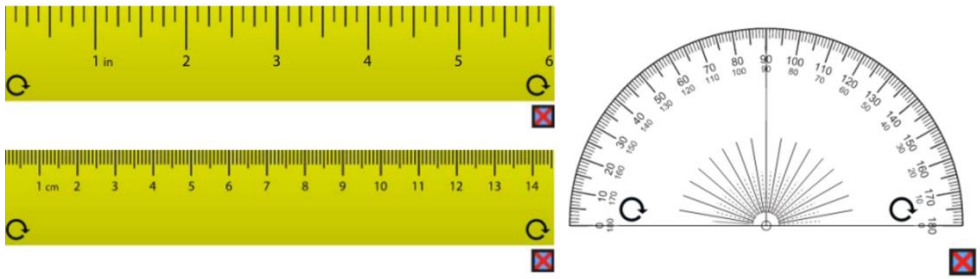
Requisite Knowledge

- 1 meter = 100 centimeters
- 1 meter = 1000 millimeters
- 1 kilometer = 1000 meters
- 1 kilogram = 1000 grams
- 1 liter = 1000 milliliters
- 1 foot = 12 inches
- 1 yard = 3 feet
- 1 minute = 60 seconds
- 1 hour = 60 minutes
- 1 day = 24 hours

- Area and Perimeter formulas for rectangles

Measurement Tools

Grade 5 rulers and protractor provided on the LEAP CBT (not actual size):



Testing Platform

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. The computer-based tests include the following online tools, which allow a student to select answer choices, “mark” tasks, eliminate answer options, highlight specific information, take notes, enlarge the task, guide the reading of a task line by line, use a ruler and protractor, apply a mask to cover a part of their screen, see the mathematics reference sheet, and use an equation builder for entering special characters. A help tool is also featured to assist students as they use the online system.

- Pointer

- Cross-off

- Highlighter

- Sticky note

- Magnifier

- Line guide

- Measurement Tools

- Masking

- Reference Sheet

- Help

- Equation Builder

Note: The images to the left represent both ways students will see the online tools. All tools, except the equation builder, will have a white background. When a student hovers the curser over the icon, it will change the background to blue as shown.

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

Sample Test Items

This section includes seven Type I tasks, one Type II task, and one Type III task as they would appear on a test. The answer keys for each Type I task and scoring rubrics for each constructed-response task are located in Appendix B. Look for some of these tasks in the OTT.

Multiple-Choice Task

Solve $\frac{6}{6} - \frac{2}{3}$

(a) $\frac{5}{6}$

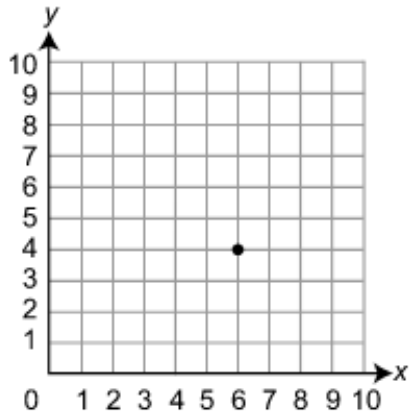
(b) $\frac{4}{3}$

(c) $\frac{2}{3}$

(d) $\frac{1}{3}$

Multiple-Select Task

Select the **three** statements that correctly describe the point plotted on the coordinate plane.



(a) The point is located at the ordered pair (4, 6).

(b) The point is located at the ordered pair (6, 4).

(c) The *x*-coordinate is 6 and the *y*-coordinate is 4.

(d) The *x*-coordinate is 4 and the *y*-coordinate is 6.

(e) The point is 4 units to the right of the origin on the *x*-axis and 6 units up from the origin on the *y*-axis.

(f) The point is 6 units to the right of the origin on the *x*-axis and 4 units up from the origin on the *y*-axis.

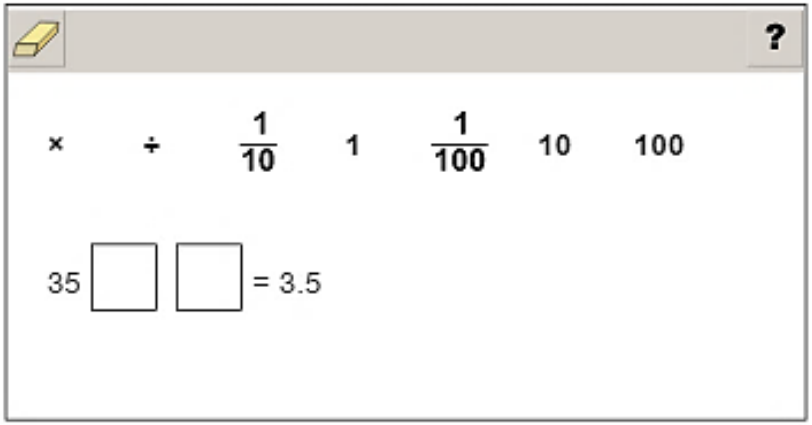
Short Answer Task

What is the value of the expression $20 \div [1 + (15 \div 5)]$?

Enter your answer in the box.

TEI: Drag-and-Drop Task

Drag and drop an operation symbol and a number into the appropria blanks to make a true statement.



TEI: Dropdown Menu Task

Select the correct numbers and symbol to create an expression that is equivalent to $\frac{5}{6}$.

Select from the drop-down menus to correctly create the expression.

Keypad Input Task

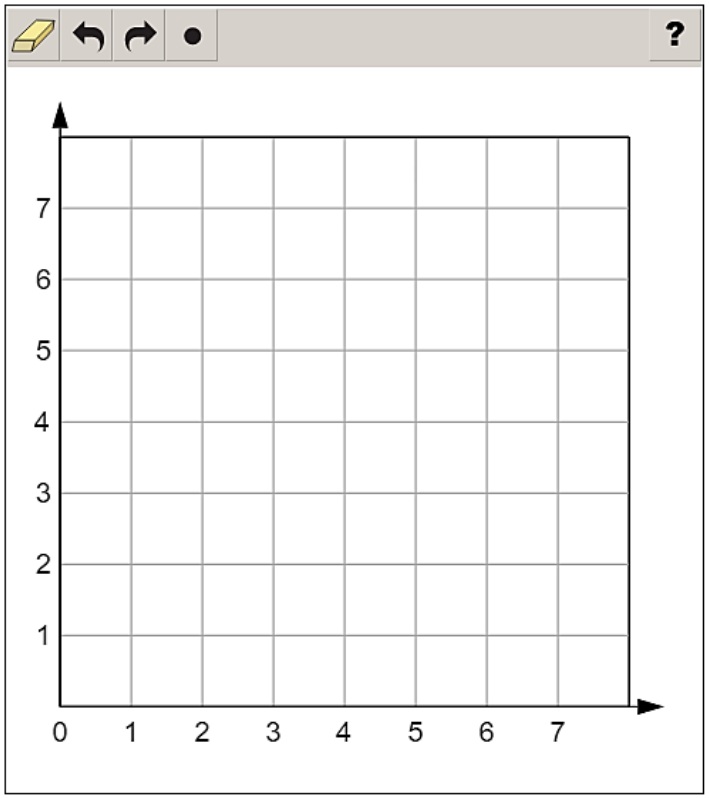
What is the value of $\frac{5}{6} - \frac{2}{3}$?

Enter your answer in the box.

TEI: Coordinate Grid Task

Plot point *A* at (4, 3), point *B* at (7, 5), and point *C* at (3, 1).

Select the places on the coordinate plane to plot the points.

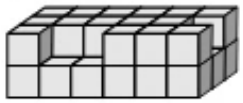


Type II Constructed-Response Task

Part A

Jake built a figure out of centimeter cubes.

Jake's Figure



What is the volume of Jake's figure?

Enter your answer in the box.

☐ cubic centimeters

Part B

Tom also made a figure. The length of his figure is 9 centimeters, the width is 2 centimeters, and the height is 1 centimeter.

What is the volume of Tom's figure?

☐ cubic centimeters

Part C

What is the total volume for both Tom and Jake's figures?

Show your work and explain how you found the total volume.

EQ

Type III Constructed-Response Task

An egg farm packages 264 total cartons of eggs each month. The farm has 3 different sizes of cartons.

- The small carton holds 8 eggs, and $\frac{1}{6}$ of the total cartons are small.
- The medium carton holds 12 eggs, and $\frac{2}{3}$ of the total cartons are medium.
- The large carton holds 18 eggs, and the rest of the total cartons are large.

Determine how many of each size of carton is needed each month. Then determine how many eggs are needed to fill the 264 cartons. Show your work or explain your answers.

Enter your answers and your work or explanations in the box provided.

EQ

Resources

Assessment Guidance Webpage

- LEAP Equation Builder for Grades 3-5: provides teachers with information on using the equation builder; Spanish
- LEAP Grades 5-HS Mathematics Reference Sheets: includes all the mathematics references sheets provided for LEAP testing
- Assessment Development Educator Review Committees: describes the item development process and associated committees, includes information on applying for participation

Practice Test Webpage

- LEAP Grade 5 Mathematics CBT Practice Test and Answer Key: includes answer keys, scoring rubrics, and alignment information; Spanish
- LEAP Mathematics Practice Test Guidance: provides guidance on using the mathematics practice tests to support instructional goals
- Practice Test Quick Start Guide: provides information regarding administration and scoring of the online practice tests

Assessment Resources Webpage

- LEAP Accessibility and Accommodations Manual: provides information about accessibility features and accommodations
- LEAP Technology Enhanced Item Types: provides a summary of technology enhanced items
- Achievement Level Descriptors: descriptions of the knowledge, skills, and cognitive processes that students should demonstrate with relative consistency and accuracy at each level of achievement
- LEAP 360: non-summative assessment system; includes diagnostic and interim assessments

DRC INSIGHT Portal (eDIRECT):

- Includes access to tutorials, manuals, and user guides

INSIGHT ^{TM}

- Online Tools Training: allows students to become familiar with the tools available in the online testing platform; also available through this link using the Chrome browser
- LEAP Grade 5 Practice Test: helps prepare students for the tests

K-12 Louisiana Math Webpage

- K-12 Louisiana Student Standards for Mathematics: explains the development of and lists the math content standards for Louisiana students
- Grade 5 Mathematics - Teachers Companion Document 2.0: contains descriptions of each standard to answer questions about the standard's meaning and how it applies to student knowledge and performance
- Grade 5 Learning Acceleration Guidance: identifies remedial standards, includes information on content emphasis
- K-12 LSSM Alignment to Rigor: provides explanations and a standards-based alignment to assist teachers in providing a rigorous education
- Math Formative Assessment Items: instructional resources in grade-level documents that teachers can download and incorporate into their daily instruction. (Password to access the document is Educate2020)

Contact the LDOE

- assessment@la.gov for assessment questions
- classroomsupporttoolbox@la.gov for curriculum and instruction questions
- AskLDOE for general questions
- ldoecommunications@la.gov to subscribe to newsletters; include the newsletter(s) you want to subscribe to in your email

Newsroom: archived copies of newsletters including LDOE Weekly School System Newsletters and Teacher Leader Newsletters

Appendix A

Assessable Content for the Major Content Reporting Category (Type I)

LSSM Content Standards	
5.NBT.A	Understand the place value system.
5.NBT.A.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
5.NBT.A.2	Explain and apply patterns in the number of zeros of the product when multiplying a number by powers of 10. Explain and apply patterns in the values of the digits in the product or the quotient, when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. *For example, $10^0 = 1$, $10^1 = 10$ … and $2.1 \times 10^2 = 210$.*
5.NBT.A.3	Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
5.NBT.A.4	Use place value understanding to round decimals to any place.
5.NBT.B	Perform operations with multi-digit whole numbers and with decimals to hundredths.
5.NBT.B.5	Fluently multiply multi-digit whole numbers using the standard algorithm.
5.NBT.B.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, subtracting multiples of the divisor, and/or the relationship between multiplication and division. Illustrate and/or explain the calculation by using equations, rectangular arrays, area models, or other strategies based on place value.
5.NBT.B.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; justify the reasoning used with a written explanation.
5.NF.A	Use equivalent fractions as a strategy to add and subtract fractions.
5.NF.A.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*
5.NF.A.2	Solve word problems involving addition and subtraction of fractions. a. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. b. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.B	Apply and extend previous understandings of multiplication and division.
5.NF.B.3	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*
5.NF.B.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(m/n) \times q$ as m parts of a partition of q into n equal parts; equivalently, as the result of a sequence of operations, $m \times q \div n$. *For example, use a visual fraction model to show understanding, and create a story context for (m/n) x q.* b. Construct a model to develop understanding of the concept of multiplying two fractions and create a story context for the equation. [In general, $(m/n) \times (c/d) = (mc)/(nd)$.] c. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. d. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
5.NF.B.5	Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
5.NF.B.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
5.NF.B.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1] a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.* b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

[1] Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

5.MD.C	Geometric measurement: understand concepts of volume.
5.MD.C.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.
5.MD.C.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units.
5.MD.C.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

LEAP Evidence Statements	
LEAP.I.5.1	Demonstrate understanding of the place value system by combining or synthesizing. Content Scope: Knowledge and skills articulated in • 5.NBT.A
LEAP.I.5.2	Solve word problems. Content Scope: Knowledge and skills articulated in • 5.NF.A – Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy.

Assessable Content for the Additional & Supporting Content Reporting Category (Type I)

LSSM Content Standards	
5.OA.A	Write and interpret numerical expressions.
5.OA.A.1	Use parentheses or bracket in numerical expressions, and evaluate expressions with these symbols.
5.OA.A.2	Write simple expressions that record calculations with whole numbers, fractions, and decimals, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 x (18,932 + 9.21) is three times as large as 18,932 + 9.21, without having to calculate the indicated sum or product.*

5.OA.B	Analyze patterns and relationships.
5.OA.B.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*
5.MD.A	Convert like measurement units within a given measurement system.
5.MD.A.1	Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real-world problems (e.g., convert 5 cm to 0.05 m; 9 ft to 108 in).
5.MD.B	Represent and interpret data.
5.MD.B.2	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally*.
5.G.A	Graph points on the coordinate plane to solve real-world and mathematical problems.
5.G.A.1	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number in the ordered pair indicates how far to travel from the origin in the direction of one axis, and the second number in the ordered pair indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).
5.G.A.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
5.G.B	Classify two-dimensional figures into categories based on their properties.
5.G.B.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
5.G.B.4	Classify quadrilaterals in a hierarchy based on properties. (Students will define a trapezoid as a quadrilateral with at least one pair of parallel sides.)

Assessable Content for Mathematical Reasoning & Modeling Reporting Category (Type II, Type III)

LEAP Evidence Statements – Type II	
LEAP.II.5.1	Base explanations/reasoning on place value and/or understanding of operations. Content Scope: Knowledge and skills articulated in • 5.NBT.B.6 – Tasks do not have a context.

LEAP.II.5.2	Base explanations/reasoning on the properties of operations. Content Scope: Knowledge and skills articulated in • 5.NBT.B.7 – Tasks do not have a context. Student need not use formal property names. Unneeded parentheses should not be used.[2] • 5.MD.C.5a – Students need not use formal property names.
LEAP.II.5.3	Base explanations/reasoning on the relationship between multiplication and division. Content Scope: Knowledge and skills articulated in • 5.NBT.B.6 • 5.NF.B.3, 5.NF.B.4a • 5.NF.B.7
LEAP.II.5.4	Base explanations/reasoning on the relationship between addition and subtraction or the relationship between multiplication and division. Content Scope: Knowledge and skills articulated in • 5.NBT.B.7
LEAP.II.5.5	Reason about the place value system itself. Content Scope: Knowledge and skills articulated in • 5.NBT.A - Tasks do not involve reasoning about place value in service of some other goal (e.g., to multiply multi-digit numbers). Rather, tasks involve reasoning directly about the place value system, in ways consistent with the indicated content scope.
LEAP.II.5.6	Base arithmetic explanations/reasoning on concrete referents such as diagrams (whether provided in the prompt or constructed by the student in her response), connecting the diagrams to a written (symbolic) method. Content Scope: Knowledge and skills articulated in • 5.NF.A.2 • 5.NF.B.4b • 5.NBT.B.6 • 5.NBT.B.7 • 5.MD.C
LEAP.II.5.7	Base explanations/reasoning on a number line diagram (whether provided in the prompt or constructed by the student in her response) • 5.NF.A.2 • 5.NF.B.4a • 5.NF.B.7a, 5.NF.B.7b

[2] For example, use $4 + 3 \times 2$ rather than $4 + (3 \times 2)$.

LEAP.II.5.8	Distinguish correct explanation/reasoning from that which is flawed, and – if there is a flaw in the argument – present corrected reasoning. (For example, some flawed 'student' reasoning is presented and the task is to correct and improve it.) Content Scope: Knowledge and skills articulated in • 5.NF.B.5b, 5.NF.B.5c, 5.NF.B.5d • 5.NF.A.1 • 5.NF.A.2 • 4.NBT, 4.NF.A, 4.NF.B – Tasks may have scaffolding.[3]
LEAP.II.5.9	Present solutions to multi-step[4] 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 • 5.MD.C.5c

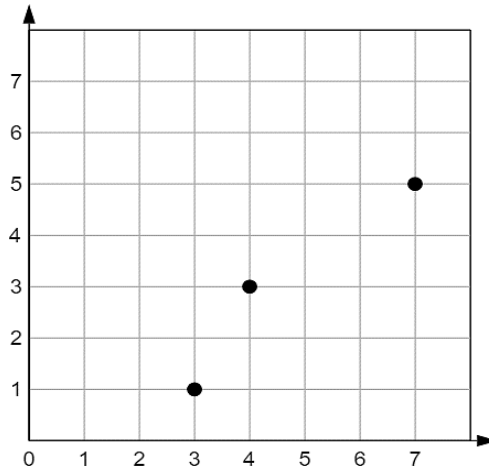
LEAP Evidence Statements – Type III	
LEAP.III.5.1	Solve multi-step[4] contextual word problems with degree of difficulty appropriate to Grade 5, requiring application of knowledge and skills articulated in the LSSM section of the Major Content Assessable Content table. Tasks may have scaffolding.[3] For assessment purposes, the possibilities for multiplication are 1-digit × 2-digit, 1-digit × 3-digit, 2-digit × 3-digit, 2-digit × 4-digit, or 3-digit × 3-digit.
LEAP.III.5.2	Solve multi-step[4] contextual problems with degree of difficulty appropriate to Grade 5, requiring application of knowledge and skills articulated in 4.OA, 4.NBT, 4.NF, and/or 4.MD. Tasks may have scaffolding.[3]

[3] 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.
[4] Multi-step problems must have at least 3 steps.

Appendix B

Answer Key/Rubrics for Sample Items

Item Type	Key	Alignment
Multiple-Choice	D	5.NF.A1
Multiple-Select	B, C, D	5.G.A.1
Short Answer	5	5.OA.A.1
TEI: Drag-and-Drop	$35 \times \frac{1}{10} = 3.5$ OR $35 \div 10 = 3.5$	5.NBT.A.1
TEI: Dropdown Menu	5 ÷ 6	5.NF.A.3
Keypad Input	$\frac{1}{6}$ (or equivalent answer)	5.NF.A.1

Item Type	Key	Alignment
Multiple-Choice	D	5.NF.A1
Multiple-Select	B, C, D	5.G.A.1
Short Answer	5	5.OA.A.1
TEI: Coordinate Grid		5.G.A.1
Type II Constructed-Response	See Rubric	LEAP.II.5.6
Type III Constructed-Response	See Rubric	LEAP.III.5.1

Type II Constructed-Response Rubric

PART A	
Score	**Description**
1	Computation component: 33
0	Student response is incorrect or irrelevant.
Part B	
1	Computation component: 18
0	Student response is incorrect or irrelevant.
PART C	
2	Reasoning component: Correct explanation and work shown Computation component: 51 cubic centimeters Sample Student Response: I added the volume of each box to find the total volume. 33 + 18 = 51 cubic centimeters
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant

Type III Constructed-Response Rubric

Score	Description
3	Computation component: 44, 176, 44; 3256 Modeling components: Correct work or explanation shown for determining the number of cartons of each size needed and determining the total number of eggs needed to fill the 264 cartons. Sample Student Response: There are $264 \times \frac{1}{6} = \frac{264}{6} = 44$ cartons that hold 8 eggs. There are $264 \times \frac{2}{3} = \frac{528}{3} = 176$ cartons that hold 12 eggs. There are 264 – 44 – 176 = 44 cartons that hold 18 eggs. The total number of eggs needed to fill all 264 cartons is $44 \times 8 + 176 \times 12 + 44 \times 18 = 3{,}256.$
2	Student response includes 2 of the 3 elements. Or, the student has a computation error, but provides a complete and valid explanation or process.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.