LOUISIANA DEPARTMENT OF EDUCATION

Office of Assessments, Accountability, and Analytics

# LEAP Assessment Guide for Grade 6 Mathematics


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## Purpose

This document is designed to assist Louisiana educators in understanding the LEAP Grade 6 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

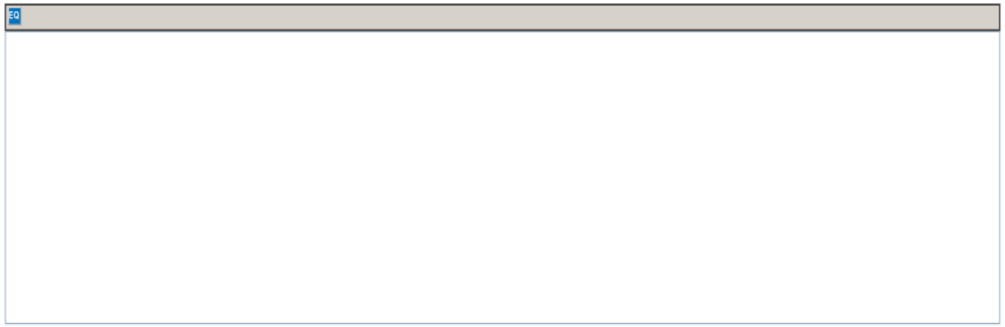
LEAP mathematics evidence statements are labeled to include the task type (I, II, or III) and the grade (3, 4, 5, 6, 7, or 8) or course (A1 or GM). LEAP evidence statements for grade 6 are labeled as "LEAP.II.6.#" for Type II tasks and "LEAP.III.6.#" for Type III tasks. See the table in Appendix A for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

## Item Types

All of the item types in the following list will appear on the test.

- Multiple Choice (MC) – This item type asks students to choose one correct answer from four 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 that more than one answer is required. The question **may or may not** specify the exact number of correct answers. The MS items are worth one point. Students must choose **all correct answers and no incorrect** answer can be chosen.
- 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 mathematically equivalent to the correct numerical answer. Answers to SA items can be positive or negative and must be entered in integer or 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 and 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. Students must meet the requirements of the question exactly to receive credit. The Online Tools Training (OTT) allows students to practice answering the different types of 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 single- or multi-part. 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, but maximum point values will vary by 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, like the shown one below.



## 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 in 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

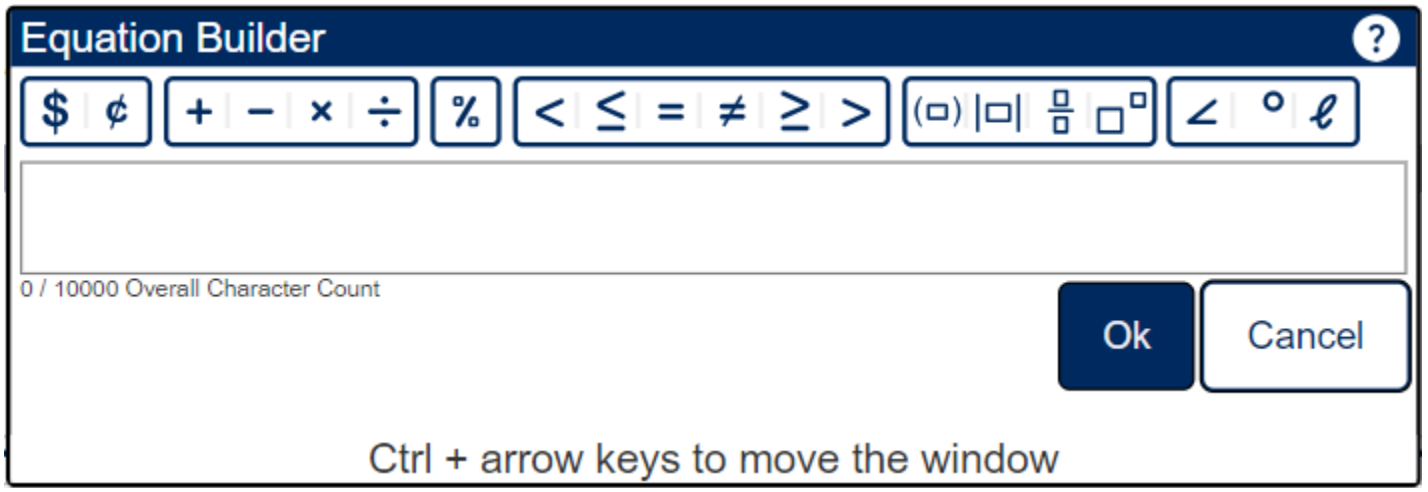
Students are **not** required to use the equation builder for any symbols that are also available on the keyboard. For example, students may use a slash, forward / or back \, to represent a fraction, a carat ^ to represent exponents, or a pair of pipes || to represent absolute value.

Additionally, symbols like degree ° and perpendicular ⊥ are not available on the keyboard, but students may type the words “degrees” and “perpendicular” as necessary.

The Equation Builder does not include all symbols/characters students might need to type into the response box. Students should know how to type a negative sign - and a colon : using the keyboard. The × button in the Equation Builder is a multiplication symbol and should not be used as a variable x, but students are not penalized if they do.

## 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 6 contains a total of 37 tasks for 55 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** | 9-11 | 11 | 5-7 | 7 | 7-9 | 9 | 23-27 | 27 |
| **B - Additional & Supporting Content** | 5-7 | 7 | 1-2 | 2 | 0 | 0 | 6-9 | 9 |
| **C - Mathematical Reasoning & Modeling** | 0 | 0 | 2 | 9 | 3 | 10 | 5 | 19 |
| **Total Operational** | 14-18 | 18 | 9-10 | 18 | 10-12 | 19 | 37 | 55 |
| **Total Field-Test** | 1-2 | N/A | 1-2 | N/A | 1 | N/A | 3-5 | N/A |
| **Session Time** | 60 minutes | | 75 minutes | | 75 minutes | | 210 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 | 28 | 28 | 36 | 51% | 66% |
| | 2-point | 4 | 8 | | 14.5% | |
| Type II | 3-point | 2 | 6 | 10 | 11% | 18% |
| | 4-point | 1 | 4 | | 7% | |
| Type III | 3-point | 1 | 3 | 9 | 5.5% | 16% |
| | 6-point | 1 | 6 | | 11% | |
| Total | | 37 | 55 | | 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 6<br>**B - Additional & Supporting Content:** solve problems involving the additional and supporting content for grade 6 | 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 |
|---|---|---|
| Rational Numbers/Multiply and Divide Fractions | 6.NS.A.1, 6.NS.C.5, 6.NS.C.6, 6.NS.C.7, 6.NS.C.8 | Students solve mathematical and word problems using multiplication and division with fractions. Students understand and apply positive and negative numbers to real-world contexts and represent them on the number line. |
| Ratio and Rate | 6.RP.A.1, 6.RP.A.2, 6.RP.A.3 | Students apply ratio and rate reasoning to solve mathematical and word problems, including percent and unit conversions. |
| Expressions, Equations, and Inequalities | 6.EE.A.1, 6.EE.A.2, 6.EE.A.4, 6.EE.B.5, 6.EE.B.6, 6.EE.B.7, 6.EE.B.8, 6.EE.C.9 | Students apply properties of operations to evaluate numerical and algebraic expressions and identify equivalent expressions. Students write, solve, and graph solutions of single-step equations and inequalities posed from mathematical and real-world problems. |

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 6 mathematics assessment.

| Tools | Provided | Session 1 | Sessions 2 & 3 | Guidelines |
|---|---|---|---|---|
| scratch paper (lined, graph, unlined), two pencils | by Test Administrator | YES | YES | • Reference sheets may be printed from the DRC Insight Portal (eDIRECT)<br>• Tools provided by Test Administrator must not be written on<br>• See Calculator Policy for calculator specifications |
| $\frac{1}{8}$—inch ruler, centimeter ruler, and protractor | online | YES | YES | |
| calculator | online and/or by Test Administrator | NO | YES | |
| Grade 6 Mathematics Reference Sheet | online and/or by Test Administrator | YES | YES | |

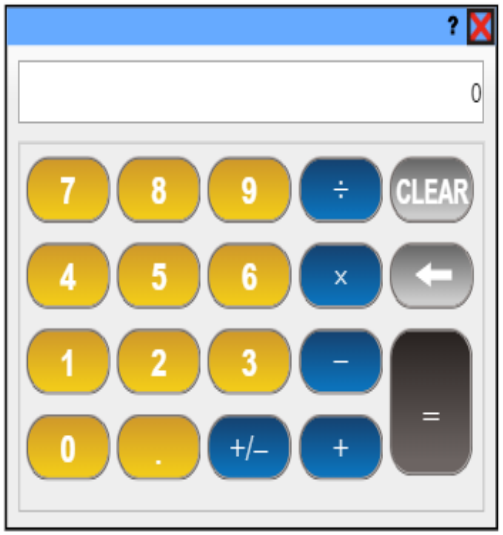
## Calculator Policy

The LEAP mathematics assessment allows a four-function calculator in grade 6 during Sessions 2 and 3. Calculators are **not** allowed during Session 1 of the test. For students with the approved accommodation, a handheld four-function calculator is allowed during all test sessions. The following table includes calculator information by session for both general testers and testers with approved accommodations for calculator use.

| Calculator Policy | Session 1 | Sessions 2 & 3 |
|---|---|---|
| General Testers | Not allowed | Four-function calculator available online, may also have hand-held |
| Testers with approved accommodation for calculator use | Four-function calculator available online, may also have handheld | |
| Additional information for testers with approved accommodations for calculator use:<br>• 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.

- Four-function calculators may have square root, percent, memory, and +/- keys.
- 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.
- 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 6 will be provided a reference sheet with the previous information. The Grade 6 Mathematics Reference Sheet may be printed from the DRC Insight Portal (eDirect) or found in the Assessment Guidance webpage on page 2 of LEAP Grades 5-HS Mathematics Reference Sheets.

- 1 inch = 2.54 cm
- 1 m = 39.37 inches
- 1 mile = 5280 feet
- 1 mile = 1760 yards
- 1 mile = 1.609 km
- 1 km = 0.62 mile

- 1 pound = 16 ounces
- 1 pound = 0.454 kg
- 1 kg = 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 L
- 1 L = 0.264 gallon
- 1 L = 1000 cubic cm

| | |
|---|---|
| Triangle | $A = \frac{1}{2}bh$ |
| Right Rectangular Prism | $V = Bh \text{ or } V = lwh$ |

Students in grade 6 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 6 assessments and is not provided in the reference sheet.

## Requisite Knowledge

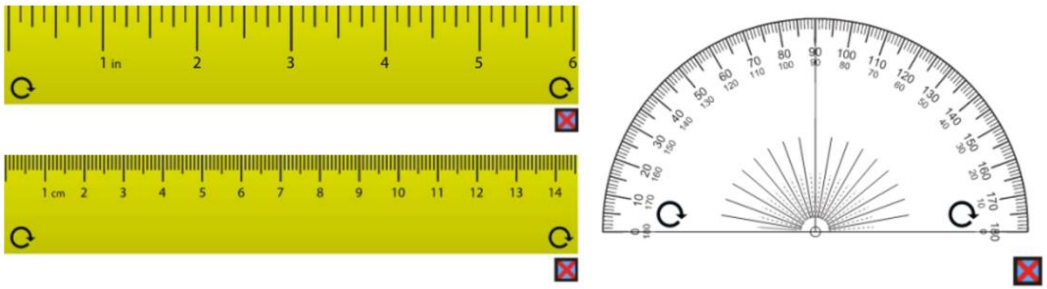
- 1 m = 100 cm
- 1 m = 1000 mm
- 1 km = 1000 m
- 1 kg = 1000 g
- 1 g = 1000 mg
- 1 L = 1000 mL

- 1 foot = 12 inches
- 1 yard = 3 feet
- 1 day = 24 hours
- 1 minute = 60 seconds
- 1 hour = 60 minutes

- Area and Perimeter formulas for rectangles

## Measurement Tools

Grade 6 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, apply a mask to cover a part of their screen, see the mathematics reference sheet, use a calculator, 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

- Calculator

- 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 six 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

Mia has $\frac{7}{8}$ pound of bird food. She puts an equal portion into 4 bird feeders. How much bird food, in pounds, does she put into each bird feeder?

(a) $\frac{7}{8}$

(b) $\frac{7}{32}$

(c) $3\frac{1}{2}$

(d) $3\frac{1}{8}$

## Multiple-Select Task

In a city election, two people ran against each other to be the next mayor.

Candidate 1 received 24,000 votes. Candidate 2 received 8,000 votes.

Which statements describe the relationship between candidate 1's votes and candidate 2's votes?

Select **all** the statements that are true.

(a) The ratio of candidate 1's votes to candidate 2's votes was 1:3.

(b) The ratio of candidate 1's votes to candidate 2's votes was 3:1.

(c) The ratio of candidate 1's votes to candidate 2's votes was 1:8,000.

(d) The ratio of candidate 2's votes to candidate 1's votes was 24:8.

(e) The ratio of candidate 2's votes to candidate 1's votes was 8:24.

(f) The ratio of candidate 2's votes to candidate 1's votes was 1:24,000.

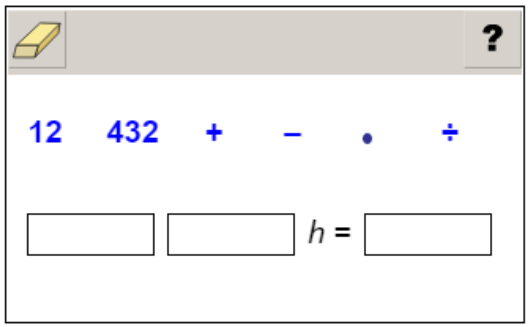
## TE: Drag-and-Drop / Short Answer Type I Task

Joanna earns $12 per hour at her job. Last week, Joanna earned $432.

**Part A**

Create an equation that can be used to determine the number of hours, *h*, Joanna worked last week.

Drag and drop the correct number or operation into each box.




**Part B**

What is the number of hours Joanna worked last week?

Enter your answer in the box.

☐ hours

## TE: Dropdown Menu Task

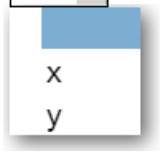
A table of *x* and *y* values is shown.

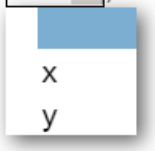
| *x* | *y* |
|---|---|
| 2 | 6 |
| 5 | 15 |
| 8 | 24 |

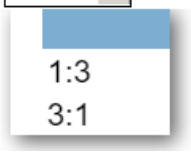
Based on the information shown in the table, select the correct letters and numbers to complete the statement.

Select from the drop-down menus to correctly complete the statement.

The value of [ ▾ ] is 3 times the corresponding value of [ ▾ ], and the ratio of *x* to *y* is [ ▾ ].



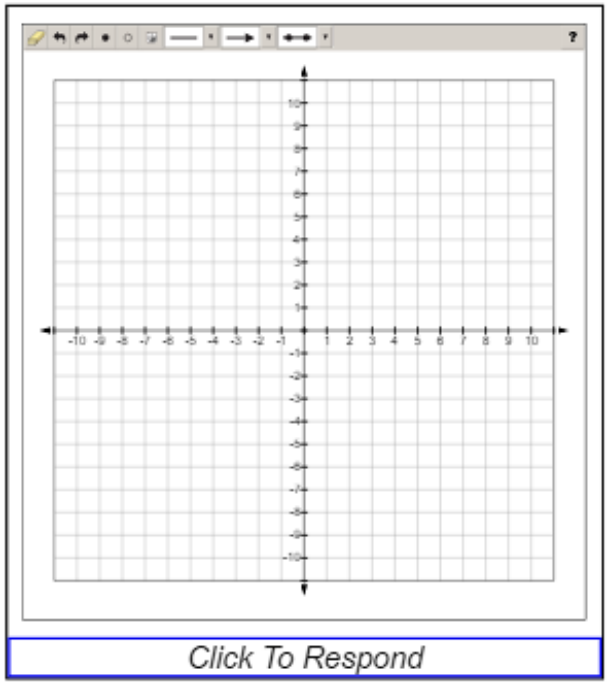



## TE: Coordinate Grid Task

Point A is located at (−2, 4)

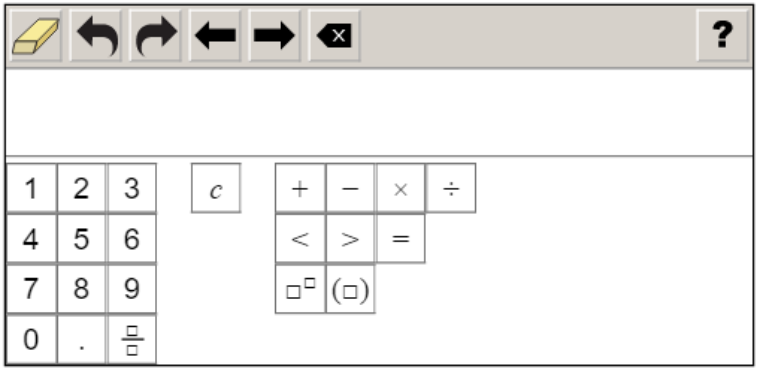
Select the place on the coordinate grid to plot the point.




## Keypad Input Task

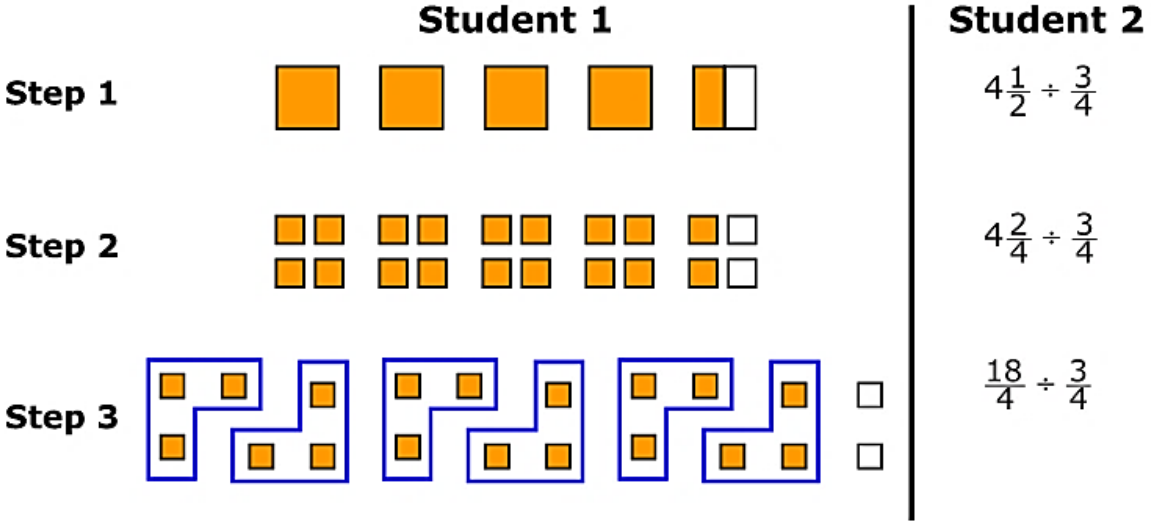
At a cafe, each cup of coffee costs $2.75. Each day, the owner of the cafe finds the total amount of coffee sales based on the number of cups of coffee sold.

Write an expression that the owner could use to represent the total amount of coffee sales, in dollars, for one day. Let $c$ be the number of cups of coffee sold in one day.



## Type II Constructed-Response Task

Two students used different methods to evaluate $4\frac{1}{2} \div \frac{3}{4}$.




For each step shown, explain how the diagram drawn by Student 1 relates to the expression written by Student 2. Show your work.

Enter your explanations and your work in the space provided.

EQ

## Type III Constructed-Response Task

### Part A

A group of hikers buys 8 bags of trail mix. Each bag contains $3\frac{1}{2}$ cups of trail mix. The trail mix is shared evenly among 12 hikers. How many cups of trail mix will each hiker receive? Show your work or explain your answer.

Enter your answer and your work or explanation in the box provided.

EQ

### Part B

The hikers plan to visit a scenic lookout. They will rest after they hike 2 miles. Then they will hike the remaining $1\frac{3}{4}$ miles to the lookout. The trail the hikers will use to return from the lookout is $\frac{1}{2}$ mile shorter than the trail they will use to go to the lookout. Each hiker will bring $\frac{1}{4}$ gallon of water for each mile to and from the lookout.

- Determine the total distance, in miles, each hiker will hike. Show your work or explain your answer.
- Determine the total number of gallons of water each hiker will bring. Show your work or explain your answer.

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

EQ

# Resources

**Assessment Guidance Webpage**

- LEAP Equation Builder for Grades 6-8: 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 6 Mathematics CBT Practice Test 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 6 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 6 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 6 Learning Acceleration Guidance: identifies the specific remedial standards necessary for every standard, 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 | |
|---|---|
| 6.RP.A | Understand ratio concepts and use ratio reasoning to solve problems. |
| 6.RP.A.1 | Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes." |
| 6.RP.A.2 | Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."[1] |
| 6.RP.A.3 | Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.<br>a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.<br>b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what unit rate were lawns being mowed?<br>c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.<br>d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. |
| 6.NS.A | Apply and extend previous understandings of multiplication and division to divide fractions by fractions. |
| 6.NS.A.1 | Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?. |
| 6.NS.C | Apply and extend previous understandings of numbers to the system of rational numbers. |

[1] Expectations for unit rates in this grade are limited to non-complex fractions.

| | |
|---|---|
| 6.NS.C.5 | Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. |
| 6.NS.C.6 | Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.<br>a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite.<br>b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.<br>c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. |
| 6.NS.C.7 | Understand ordering and absolute value of rational numbers.<br>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right*.<br>b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3 °C > -7 °C to express the fact that -3 °C is warmer than -7 °C*.<br>c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write \|-30\| = 30 to describe the size of the debt in dollars*.<br>d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars*. |
| 6.NS.C.8 | Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. |
| ■ 6.EE.A | ■ Apply and extend previous understandings of arithmetic to algebraic expressions. |
| 6.EE.A.1 | Write and evaluate numerical expressions involving whole-number exponents. |
| 6.EE.A.2 | Write, read, and evaluate expressions in which letters stand for numbers.<br>a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 - y. |

| | |
|---|---|
| | b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.<br>c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2. |
| 6.EE.A.4 | Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for. |
| ■ 6.EE.B | ■ Reason about and solve one-variable equations and inequalities. |
| 6.EE.B.5 | Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. |
| 6.EE.B.6 | Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. |
| 6.EE.B.7 | Solve real-world and mathematical problems by writing and solving equations and inequalities of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers. Inequalities will include <, >, ≤, and ≥ |
| 6.EE.B.8 | Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams. |
| ■ 6.EE.C | ■ Represent and analyze quantitative relationships between dependent and independent variables. |
| 6.EE.C.9 | Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time. |

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

| LSSM Content Standards | |
|---|---|
| 6.NS.B | Compute fluently with multi-digit numbers and find common factors and multiples. |
| 6.NS.B.2 | Fluently divide multi-digit numbers using the standard algorithm. |
| 6.NS.B.3 | Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. |
| 6.NS.B.4 | Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2). |
| 6.G.A | Solve real-world and mathematical problems involving area, surface area, and volume. |
| 6.G.A.1 | Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. |
| 6.G.A.2 | Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = B h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. |
| 6.G.A.3 | Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. |
| 6.G.A.4 | Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. |
| 6.SP.A | Develop understanding of statistical variability. |
| 6.SP.A.1 | Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages. |
| 6.SP.A.2 | Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. |
| 6.SP.A.3 | Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. |
| 6.SP.B | Summarize and describe distributions. |
| 6.SP.B.4 | Display numerical data in plots on a number line, including dot plots, histograms, and box plots. |

| | |
|---|---|
| 6.SP.B.5 | Summarize numerical data sets in relation to their context, such as by:<br>a. Reporting the number of observations.<br>b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.<br>c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.<br>d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. |

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

| LEAP Evidence Statements – Type II | |
|---|---|
| LEAP.II.6.1 | Base explanations/reasoning on the properties of operations. Content Scope: Knowledge and skills articulated in<br>• 6.EE.A.3, 6.EE.A.4 – Students need not use formal property names. |
| LEAP.II.6.2 | Base explanations/reasoning on the relationship between addition and subtraction or the relationship between multiplication and division. Content Scope: Knowledge and skills articulated in<br>• 6.NS.A.1 |
| LEAP.II.6.3 | 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<br>• 6.NS.A.1 |
| LEAP.II.6.4 | 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<br>• 6.NS.C.6, 6.NS.C.7 |
| LEAP.II.6.5 | 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<br>• 6.NS.C.6, 6.NS.C.8 |
| LEAP.II.6.6 | 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<br>• 6.EE.B – Tasks do not require students to write an equation or inequality. |

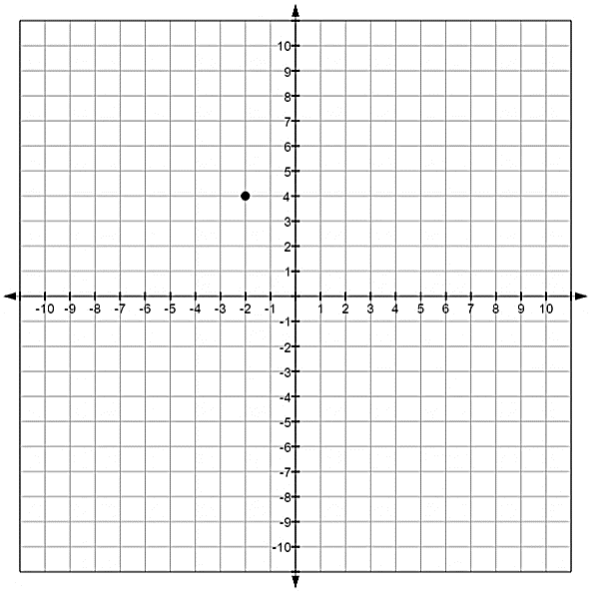
| | |
|---|---|
| LEAP.II.6.7 | Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. Content Scope: Knowledge and skills articulated in<br>• 6.EE.A.4 |
| LEAP.II.6.8 | Present solutions to multi-step problems in the form of valid chains of reasoning, using 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<br>• 6.RP.A – Ratios are limited to ratios of non-complex fractions.<br>• 6.EE.C.9 - Tasks that involve writing an equation should not go beyond the equation types described in 6.EE.7 (x+p =q and px = q where p, q, and x are all nonnegative rational numbers). |
| LEAP.II.6.9 | 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<br>• 5.NBT, 5.MD.C - Tasks may have scaffolding. [2] |

| **LEAP Evidence Statements – Type III** | |
|---|---|
| LEAP.III.6.1 | Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 6, requiring application of knowledge and skills articulated by the LSSM section of the Major Content Assessable Content table. Tasks may have scaffolding.[2] |
| LEAP.III.6.2 | Solve multi-step contextual problems with degree of difficulty appropriate to Grade 6, requiring application of knowledge and skills articulated in 5.NBT.B, 5.NF, 5.MD, and 5.G.A. Tasks may have scaffolding.[2] |
| LEAP.III.6.3 | 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 6.RP.A.3, 6.NS.A.1, and 6.G.A.1. Tasks may have scaffolding.[2] |

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.

# Appendix B

## Answer Key/Rubrics for Sample Items

| Item Type | Key | Alignment |
|---|---|---|
| Multiple-Choice | B | 6.NS.A.1 |
| Multiple-Select | B, E | 6.RP.A.1 |
| TE: Drag-and-Drop / Short Answer | Part A: 12 . $h$ = 432<br>Part B: 36 | 6.EE.B.7 |
| TE: Dropdown Menu | The value of [y] is 3 times the corresponding value of [x], and the ratio of $x$ to $y$ is [1:3]. | 6.RP.A.1 |
| TE: Coordinate Grid |  | 6.NS.C.6c |
| Keypad Input | $2.75c$ (or equivalent expression) | 6.EE.B.6 |

| Item Type | Key | Alignment |
|---|---|---|
| Type II Constructed-Response | See Rubric | LEAP.II.6.3 |
| Type III Constructed Response | See Rubric | LEAP.III.6.2 |

## Type II Constructed-Response Rubric

| Score | Description |
|---|---|
| 3 | Student response includes each of the following 3 elements.<br>Reasoning component, 3 points<br>○ Correct explanation of relationship between work of Student 1 and work of Student 2 in step 1<br>○ Correct explanation of relationship between work of Student 1 and work of Student 2 in step 2<br>○ Correct explanation of relationship between work of Student 1 and work of Student 2 in step 3<br><br>Sample Student Response:<br>In step one, Student 1 represents $4\frac{1}{2}$ as five congruent figures, four of which are shaded entirely and one of which is shaded by half. In step two, Student 1 breaks every whole into four congruent parts, maintaining the original shading. Student 2 makes common denominators for $\frac{1}{2}$ and $\frac{3}{4}$, changing $4\frac{1}{2}$ to $4\frac{2}{4}$. Both students relate $4\frac{1}{2}$ as groups of 4. In step three, Student 1 groups the congruent figures into 6 groups of 3, which represents the value of $4\frac{1}{2} \div \frac{3}{4}$. Student 2 converts $4\frac{2}{4}$ into $\frac{18}{4}$, which is the number of grouped figures drawn by Student 1. |
| 2 | Student response includes 2 of the 3 elements. |
| 1 | Student response includes 1 of the 3 elements. |
| 0 | Student response is incorrect or irrelevant. |

**Type III Constructed-Response Rubric**

| **PART A** | |
|---|---|
| **Score** | **Description** |
| **2** | Student response includes each of the following 2 elements.<br>• Correct number of cups of trail mix per hiker, $2\frac{1}{3}$ cups<br>• Valid work or explanation shown<br>Sample Student Response:<br>8 bags of trail mix at $3\frac{1}{2}$ cups per bag is $8\left(3\frac{1}{2}\right) = \left(\frac{8}{1}\right)\left(\frac{7}{2}\right) = \frac{56}{2} = 28$ cups<br>28 cups divided among 12 hikers is $\frac{28}{12} = \frac{7}{3} = 2\frac{1}{3}$ cups of trail mix per hiker |
| **1** | Student response includes 1 of the 2 elements. |
| **0** | Student response is incorrect or irrelevant. |
| **Part B** | |
| **Score** | **Description** |
| **4** | Student response includes each of the following 4 elements.<br>• Correct number of miles hiked by each hiker, 7 miles<br>• Correct work shown or explanation given to determine the number of miles hiked by each hiker<br>• Correct total amount of water brought by each hiker, $1\frac{3}{4}$ gallons<br>• Correct work shown or explanation given to determine the total amount of water brought by each hiker<br>Sample Student Response:<br>The distance to the scenic lookout is $2 + 1\frac{3}{4} = \frac{8}{4} + \frac{7}{4} = \frac{15}{4}$. The distance back from the lookout is $\frac{15}{4} - \frac{1}{2} = \frac{15}{4} - \frac{2}{4} = \frac{13}{4}$.<br>The total distance is $\frac{15}{4} + \frac{13}{4} = \frac{28}{4} = 7$. The total amount of water brought by each hiker is $\frac{1}{4}(7) = \frac{7}{4} = 1\frac{3}{4}$ gallons. |
| **3** | Student response includes 3 of the 4 elements. |
| **2** | Student response includes 2 of the 4 elements. |
| **1** | Student response includes 1 of the 4 elements. |
| **0** | Student response is incorrect or irrelevant. |