

**Louisiana Educational Assessment Program
for the 21st Century (LEAP 21)**

**GRADE 4 SAMPLE ITEMS AND STUDENT WORK
FROM THE 2000–2001 LEAP 21 TESTS**

LEAP 21 is an integral part of the Louisiana school and district accountability system passed by the state legislature and signed into law by Governor Mike Foster in 1997. The primary purposes of the accountability system are to raise expectations for achievement for all Louisiana public school students and to improve public education in the state.

In the school year 2000–2001, students in grade 4 took LEAP 21 English Language Arts, Mathematics, Science, and Social Studies tests. The test scores are combined with other relevant data to create school and district accountability scores, which serve as a means of measuring educational quality and improvement in educational programs over time.

This document is part of a series meant to promote understanding of the knowledge and skills that students must have and the kinds of work they must produce to be successful on the LEAP 21 tests. A list of other documents providing background and further information on the LEAP 21 can be found by accessing the Louisiana Department of Education Web site at www.louisianaschools.net.

LEAP 21 Reports

Louisiana's grade 4 students are tested in March of each year. Individual student, school, district, and state test results are reported in May and July. School and district accountability results are reported in September.

For LEAP 21, student scores are reported in terms of five achievement levels: *Advanced*, *Proficient*, *Basic*, *Approaching Basic*, and *Unsatisfactory*. The percentages of students scoring at each level are reported for the school, district, and state. The general definitions for the achievement levels are shown on page 2. The specific definitions of the achievement levels for English Language Arts and Mathematics have been published previously in the 1999 Released Items documents; the achievement levels for Science and Social Studies have been published previously in the 2000 Released Items documents.

LEAP 21
General Achievement Level Definitions

Achievement Level	Definition
Advanced	A student at this level has demonstrated superior performance beyond the proficient level of mastery.
Proficient	A student at this level has demonstrated competency over challenging subject matter and is well prepared for the next level of schooling.
Basic	A student at this level has demonstrated only the fundamental knowledge and skills needed for the next level of schooling.
Approaching Basic	A student at this level has only partially demonstrated the fundamental knowledge and skills needed for the next level of schooling.
Unsatisfactory	A student at this level has not demonstrated the fundamental knowledge and skills needed for the next level of schooling.

Purpose of This Document

This document presents student work in all four subject areas. The work was completed as part of the LEAP 21 assessment. It includes examples of multiple-choice, constructed-response (short answer and extended response) items, a written composition, and a science task, all of which exemplify what students scoring at specified achievement levels should know and be able to do. A discussion of each item highlights the knowledge and skills it is intended to measure, as well as strengths and weaknesses in the student work on the item.

As you review the items, it is important to remember that a student's achievement level is based on his or her *total test score* (cumulative score for all questions in the test) in a content area, *not* on one particular item or section, and that the sample items included in this report represent a small portion of the body of knowledge and skills measured by the LEAP 21 tests. Additional items will be released in future years of the LEAP 21.

Mathematics

The grade 4 LEAP 21 Mathematics test is composed of 60 multiple-choice and three constructed-response items. A student earns one point for each correct answer to a multiple-choice item and from zero to four points for the answer(s) and work shown for each constructed-response item. The general scoring rubric, or guide, for constructed-response items is shown below.

Score	Description
4	<ul style="list-style-type: none">• The student's response demonstrates in-depth understanding of the relevant content and/or procedures.• The student completes all important components of the task accurately and communicates ideas effectively.• Where appropriate, the student offers insightful interpretations and/or extensions.• Where appropriate, the student uses more sophisticated reasoning and/or efficient procedures.
3	<ul style="list-style-type: none">• The student completes most important aspects of the task accurately and communicates clearly.• The response demonstrates an understanding of major concepts and/or processes, although less important ideas or details may be overlooked or misunderstood.• The student's logic and reasoning may contain minor flaws.
2	<ul style="list-style-type: none">• The student completes some parts of the task successfully.• The response demonstrates gaps in conceptual understanding.
1	<ul style="list-style-type: none">• The student completes only a small portion of the task and/or shows minimal understanding of the concepts and/or processes.
0	<ul style="list-style-type: none">• Student's response is incorrect, irrelevant, too brief to evaluate, or blank.

Note: It is important to recognize that the score points for constructed-response items and the LEAP 21 achievement levels do not share a one-to-one correspondence. For example, it should *not* be assumed that a student who scores at the *Advanced* achievement level in the assessment has earned a score of 4 on each of the constructed-response items.

It is possible for a fourth-grade student to earn a total of 72 points in the LEAP 21 Mathematics test. The number of score points that a student would have to achieve to reach each achievement level may change slightly from year to year, given the difficulty of that particular form of the test. The cut scores for each achievement level are in the ranges listed on the next page.

Spring 2001 Mathematics Test, Grade 4

Achievement Level	Raw Score Range
Advanced	67–72 points
Proficient	59.5–66.5 points
Basic	43–59 points
Approaching Basic	32.5–42.5 points
Unsatisfactory	0–32 points

The following section of this document presents one multiple-choice item for each achievement level, except for the *Unsatisfactory* level. Examples of *Unsatisfactory* work are not included; by definition, work at that achievement level exhibits a narrower range of knowledge and skills than work classified as *Approaching Basic*. In addition, we include one constructed-response item with student work. An example of student work for each score point is provided.

This document presents items that were completed by students as part of the LEAP 21 assessment. The information shown for each item includes

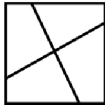
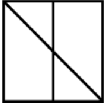
- the correct answer,
- the achievement level or score point,
- commentary on the skills/knowledge measured by the item, and
- the standard and benchmark each item measures.

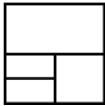
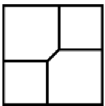
Grade 4 – Mathematics
Multiple-Choice Items

Advanced Achievement Level
Multiple-Choice Item

The question shown below would most likely be answered correctly by students who score at the *Advanced* achievement level. A student scoring at this level demonstrates superior performance beyond the proficient level of mastery. The content standard for this item is **Geometry**. In solving problems in this content standard, students demonstrate an understanding of geometric concepts, and applications involving one-, two-, and three-dimensional figures.

Which figure is divided into 4 congruent shapes?

*A.  C. 

B.  D. 

* correct answer

This item requires fourth-grade students to understand that “congruent” means “the same shape and same size.” Students scoring at a lower achievement level may have been attracted to option “B” because they are all rectangles or squares, without realizing that some of the sides are different lengths. Calculators are not needed for this item.

Proficient Achievement Level
Multiple-Choice Item

The question shown below would most likely be answered correctly by students who score at the *Proficient* achievement level and above. A student scoring at this level demonstrates competency over challenging subject matter and is well prepared for the next level of schooling. The content standard for this item is ***Patterns, Relations, and Functions***. In solving problems in this content standard, students demonstrate an understanding of patterns, relations, and functions that represent and explain real-world situations.

Bettina noticed that the numbers on the front of the floats in the parade followed the pattern shown below. What number was on the 4th float?

1, 3, 7, , 21, 31

- A. 9
- B. 11
- *C. 13
- D. 14

* correct answer

This item requires fourth-grade students to use their problem-solving skills to analyze the pattern and find the missing number. To do this, the students must realize that the numbers are not simply increasing by a constant amount. One way students can discover the pattern in this item is by finding the differences between the numbers and observing that the differences are increasing by 2 each time. Calculators are not allowed for this item.

Basic Achievement Level
Multiple-Choice Item

The question shown below would most likely be answered correctly by students who score at the *Basic* achievement level and above. A student scoring at this level demonstrates only the fundamental knowledge and skills needed for the next level of schooling. The content standard for this item is **Number and Number Relations**. In solving problems in this content standard, students demonstrate an understanding of the real number system and communicate the relationships within that system using a variety of techniques and tools.

The table below represents the number of people who saw a movie at the Ritz Theater last week. Use this table to answer question XX.

RITZ THEATER ATTENDANCE

Day	People
Sunday	294
Monday	200
Tuesday	187
Wednesday	218
Thursday	245
Friday	300
Saturday	326

If each movie theater ticket costs \$7.50, what steps would you take to find out how much money the movie theater made in ticket sales from Friday and Saturday?

- * A. Add 300 and 326, then multiply the sum by \$7.50.
- B. Add $300 + 326 + \$7.50$.
- C. Multiply 300 by \$7.50 three times and add \$326.
- D. Divide 300 by \$7.50 and add \$326.

* correct answer

This item requires the students to determine which process can be used to find the correct answer. The students must realize that the first step is to find the total number of tickets sold on Friday and Saturday. This can be done by adding 300 and 326. The second step is to multiply the total number of tickets sold on Friday and Saturday by the cost per ticket (\$7.50). Calculators are not needed for this item.

Approaching Basic Achievement Level
Multiple-Choice Item

The question shown below would most likely be answered correctly by students who score at the *Approaching Basic* achievement level and above. A student scoring at this level only partially demonstrates the fundamental knowledge and skills needed for the next level of schooling. The content standard for this item is **Algebra**. In solving problems in this content standard, students demonstrate an understanding of concepts and processes that allows them to analyze, represent, and describe relationships among variable quantities and to apply algebraic methods to real-world situations.

Pat is 23 years old. How old will Pat be in N years?

- A. $N \times 23$
- B. $N - 23$
- C. $N \div 23$
- * D. $N + 23$

* correct answer

This item requires fourth-grade students to represent a common real-life experience using a mathematical expression. The students must understand that the variable (N) can represent any number of years. They must then decide which arithmetic operation would be used to calculate Pat's age and identify the correct symbol for that operation. Calculators are not needed for this item.

Responses are scored using the rubric below.

Score	Description
4	Reasonable estimate of 3 1/2 or 4 hours with clear explanation or work justifying estimate.
3	Reasonable estimate of 3 1/2 or 4 hours with vague explanation. OR Clear explanation of correct estimation method with a minor error in implementation.
2	Shows definite understanding of relation between time spent scrubbing the portion of the floor and time required for entire floor.
1	Estimate of 3 1/2 or 4 hours with no explanation. OR Response shows minimal understanding of problem.
0	Incorrect, irrelevant, too brief to evaluate, or blank.

Notes:

- Do not penalize student for answering how much **more** time it will take instead of how much time in all. Intent of student must be clear, however.
- Do not penalize student for giving the answer in minutes.
- Students may work with 30 minutes as 1/2 hour. They may use multiplication or repeated addition to find total time, or they may just intuitively know that, for example, 8 one-half hours is 4 hours.

Score Point 4
Constructed-Response Item

Below is the work of a fourth-grade student who received 4 points for his or her response. A score point of 4 is given when a student completes all important components of the task and communicates ideas effectively. The student demonstrates in-depth understanding of the content area and completes all of the important components of the task.

The shaded area of the picture below shows how much of the floor Mr. Randall can scrub in 30 minutes.

1.	3.	5.	7.
30	30	30	30
2.	4.	6.	8.

He wonders about how long it will take him to scrub the **whole** floor.

a. About how long will it take him to scrub the **whole** floor?

$$\begin{array}{r} 30 \\ \times 8 \\ \hline 240 \text{ min} \end{array}$$

b. Explain how you found your answer. Be sure to include a drawing of the floor in your explanation.

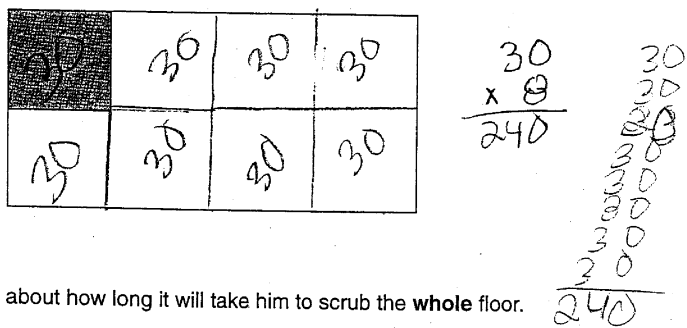
There are 7 more spots the size it takes him to do in 30 min. So if you multiply it by 8 it would give you the # of min. it would take.

This response demonstrates the student's math skills, as well as his or her ability to explain how the answer was derived. The student gives the correct estimate of 4 hours (240 minutes), with work shown and an explanation that clearly demonstrates a correct estimation method. The response is complete and demonstrates an in-depth understanding of all the important components of the task.

Score Point 3
Constructed-Response Item

Below is the work of a fourth-grade student who received 3 points for his or her response. A score point of 3 is given when a student completes the most important aspects of the required task and communicates his or her ideas clearly. The response should demonstrate the student's understanding of major concepts and/or processes, although the student may have overlooked or misunderstood the less important ideas.

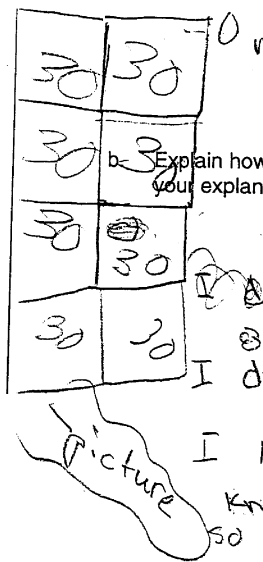
The shaded area of the picture below shows how much of the floor Mr. Randall can scrub in 30 minutes.



He wonders about how long it will take him to scrub the **whole** floor.

a. About how long will it take him to scrub the **whole** floor?

2 hours 40 min



b. Explain how you found your answer. Be sure to include a drawing of the floor in your explanation.

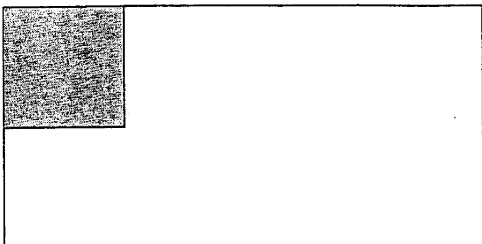
I added the tiles and then when I counted it it was 8 tiles
 I drew more tiles and I got 8 tiles
 I knew that we are suppose to know that each tile takes 30 min
 so $30 \times 8 = 240$ or 30 8 times equal
 and I get 240

This response demonstrates that the student has the math skills required to answer most of the question correctly. The student shows correct work and provides a clear explanation of a correct estimation method. The response demonstrates the student's understanding of the major processes, but contains a minor error (2 hours 40 minutes should be 240 minutes) in determining the final answer.

Score Point 2
Constructed-Response Item

Below is the work of a fourth-grade student who received 2 points for his or her response. A score point of 2 is given when a student completes some parts of the task successfully. The student's response demonstrates gaps in conceptual understanding.

The shaded area of the picture below shows how much of the floor Mr. Randall can scrub in 30 minutes.

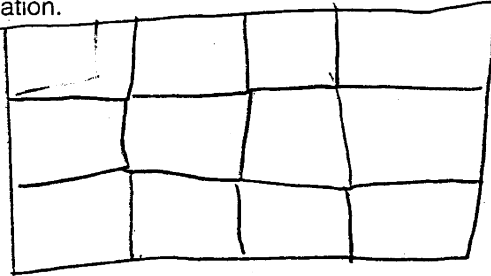


He wonders about how long it will take him to scrub the **whole** floor.

a. About how long will it take him to scrub the **whole** floor?

About 6 hours

b. Explain how you found your answer. Be sure to include a drawing of the floor in your explanation.



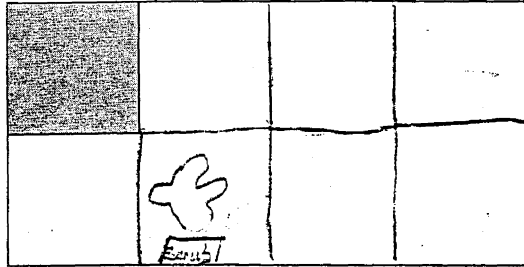
keep adding
30 minutes

This response demonstrates a partial understanding of a correct estimation method, while demonstrating gaps in the student's conceptual understanding of the important components of the task. The response shows a definite understanding of the relationship between the time spent scrubbing a portion of the floor and the time required to scrub the entire floor. However, the answer is incorrect because the student does not demonstrate an understanding of the fact that the new portions of the floor need to be equal in area to the given portion.

Score Point 1
Constructed-Response Item

Below is the work of a fourth-grade student who received 1 point for his or her response. A score point of 1 is given when a student completes only a small portion of the task. The student's response demonstrates minimal understanding of the concepts and/or processes.

The shaded area of the picture below shows how much of the floor Mr. Randall can scrub in 30 minutes.



He wonders about how long it will take him to scrub the **whole** floor.

a. About how long will it take him to scrub the **whole** floor?

45 min
answer

b. Explain how you found your answer. Be sure to include a drawing of the floor in your explanation.

$$\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \text{ min} \end{array}$$

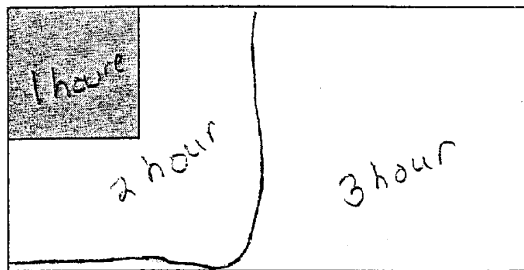
(45) min
answer

This response demonstrates a minimal understanding of the important components of the task. The work shown, dividing the floor into eight equal portions, demonstrates only a minimal understanding of a correct estimation method. The response does not demonstrate an understanding of the relationship between the time spent scrubbing a portion of the floor and the time required to scrub the entire floor.

Score Point 0
Constructed-Response Item

Below is the work of a fourth-grade student who received 0 points for his or her response. A score point of 0 is given when a student's response is incorrect, irrelevant, too brief to evaluate, or blank.

The shaded area of the picture below shows how much of the floor Mr. Randall can scrub in 30 minutes.



He wonders about how long it will take him to scrub the **whole** floor.

a. About how long will it take him to scrub the **whole** floor? 3 hours

b. Explain how you found your answer. Be sure to include a drawing of the floor in your explanation.

1 hour 2 hour 3 hour

The response demonstrates no understanding of any of the components of the question. The work shown does not demonstrate any understanding of a correct estimation method or any understanding of the relationship between the time spent scrubbing a portion of the floor and the time required to scrub the entire floor.