2004-2005 CSAP DEMONSTRATION PACKET

Grades 3 and 4 Mathematics
Demonstration Materials
For the
Grades 3 and 4
Mathematics CSAP

This packet was assembled through the Student Assessment Unit of the Colorado Department of Education. Its purpose is to inform Colorado teachers of the structure and focus of the new 3rd and 4th grade Mathematics CSAP tests, provide examples of items that could be included, and give references to other related resources.

Table of Contents

<table>
<thead>
<tr>
<th></th>
<th>pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fact sheet</td>
<td>1</td>
</tr>
<tr>
<td>A Reviewer Thoughts on preparation</td>
<td>2</td>
</tr>
<tr>
<td>Sample Reviewed Items</td>
<td>3 - 12</td>
</tr>
<tr>
<td>Other Resources</td>
<td>13 - 29</td>
</tr>
<tr>
<td>NAEP</td>
<td></td>
</tr>
<tr>
<td>Other Websites</td>
<td></td>
</tr>
</tbody>
</table>

Thanks to Patty Bell, Mathematics educator, for helping define the necessary contents of this packet and to Margaret Delgado, Program Assistant, for assembling the packet to be available in both hardcopy and electronic form.

Glenn Bruckhart, Senior Consultant – Mathematics
Beth Celva, Director

Student Assessment Unit September, 20, 2004
# Grades 3 and 4 Mathematics CSAP Factsheet

<table>
<thead>
<tr>
<th>Grade 3</th>
<th>Grade 4</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Number of Sessions</td>
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<td>55 min.</td>
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<tr>
<td>20</td>
<td>23</td>
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<tr>
<td>Items per Session</td>
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## Item types per Session

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>16</td>
<td>Multiple Choice (1 point)</td>
</tr>
<tr>
<td></td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Constructed Response</td>
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<tr>
<td>3</td>
<td>Short (2 points)</td>
</tr>
<tr>
<td>1</td>
<td>Medium (3 points)</td>
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<tr>
<td>0</td>
<td>Extended (4 points)</td>
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</table>

<table>
<thead>
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<th>Grade 4</th>
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</table>

<table>
<thead>
<tr>
<th>50</th>
<th>Total Test Points</th>
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<tr>
<td>96</td>
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## % of Points per Standard

<table>
<thead>
<tr>
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<th>Grade 3</th>
<th>Grade 4</th>
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<tbody>
<tr>
<td>1</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>35%</td>
<td>30%</td>
</tr>
<tr>
<td>6</td>
<td>20%</td>
<td>20%</td>
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</table>

## Manipulative Allowed

<table>
<thead>
<tr>
<th></th>
<th>Pattern Blocks</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Ruler</td>
</tr>
<tr>
<td></td>
<td>Counters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Pattern Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ruler</td>
</tr>
<tr>
<td></td>
<td>Counters</td>
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</tbody>
</table>

## Subcontent Areas

<table>
<thead>
<tr>
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<th>Number and Operation</th>
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<td>Patterns</td>
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<tr>
<td></td>
<td>Measurement</td>
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<table>
<thead>
<tr>
<th>None</th>
<th>Spanish Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
Thoughts for your consideration from the item reviewers as you prepare 3rd and 4th grade students for the Math CSAP

1. Be sure to look at the Standards and Frameworks for the test. Available on the CDE website http://www.cde.state.co.us/cdeassess/csap/frameworks/index.htm. This will guide you in knowing what is expected and what vocabulary to introduce. Familiarity with this document will guide you in planning for your lessons.

2. There are sample items available there as well. Also, visit the NAEP (National Assessment of Educational Progress), http://nces.ed.gov/nationsreportcard.htm, website for similar items that come with results from previous administrations of that test and student work samples.

3. Teach a balanced program. Students need to be able to do computation on the test, but all strands are covered by the test. Most computation is in word problems and embedded in problem solving situations.


5. Help students learn to communicate about the mathematics they are using. In the classroom this may take the form of class discourse, sharing strategies, presentations of solutions, and written explanations in journals.

6. Train students to work with units/identifying labels when answering a math question. This will attach meaning to the number and help to make sense of the question posed and the answer found. Another way to think about this is that the number is an adjective that further explains the noun that answers the question.

7. When there is a line after a question or in a box, that is where an answer is to be written. Graders will make every attempt to give credit to students for any work done, but training children to write the answer on the line when prompted to do so will enhance their work.

8. In some items, critical parts of the directions may be in boldface. Students should pay attention to those words. In addition, problems that have multiple parts will signal that to students with Part A, Part B, etc. Alert students to watch for these.

9. Students are to use the test booklet for scratch paper, showing their work. Try to get students to not erase attempts. They may get some credit for partially correct work/attempts even if incomplete or incorrect answers result.

10. Manipulatives provided for this test will be: a punch-out set of Pattern Blocks, inch square counters, a ruler marked in centimeters and inch/half inch. Students should be familiarized with pattern blocks and use of a ruler through lessons in your classroom.

11. Students should be taught to deal with names used in prompts and story problems as they do in the reading and writing tests.

12. Number talks are an excellent teaching tool for getting students to think about how computation concepts are developed. Make sure that students see many different presentations of computation problems: horizontal and vertical, blank and box, different signs.
Sample Test Items

Items that appear on the CSAP test are written for the Colorado State Mathematics Standards. Specifically, each item must match one of the statements on the grade level Assessment Framework for which it was written. (See Grades 3 and 4 Math Assessment Frameworks at http://www.cde.state.co.us/cdeassess/csap/frameworks/index.htm) A panel of Colorado teachers reviews the match and appropriateness of each item. Only those items that are approved by this panel appear on the CSAP tests.

The seven problems that follow are samples of items that have gone through this process and could have been used on the 3rd and 4th grade Math CSAP for 2005, but are released to serve as examples. The specification for each item follows:

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Type*</th>
<th>Framework Reference</th>
<th>Approved for Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MC</td>
<td>5.1a</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>SCR</td>
<td>3.1a</td>
<td>3 or 4</td>
</tr>
<tr>
<td>3</td>
<td>MCR</td>
<td>6.1a</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>ECR</td>
<td>2.3a</td>
<td>4 or 5</td>
</tr>
<tr>
<td>5</td>
<td>SCR</td>
<td>1.2c</td>
<td>4 or 3</td>
</tr>
<tr>
<td>6</td>
<td>MC</td>
<td>4.1a</td>
<td>4 or 3</td>
</tr>
<tr>
<td>7</td>
<td>MC</td>
<td>1.1a</td>
<td>4 or 5</td>
</tr>
</tbody>
</table>

4 or 3 = 4th grade item also approved for grade 3.

* MC = Multiple choice
SCR = Short Constructed Response
MCR = Medium Constructed Response
ECR = Extended Constructed Response

Note: An item may cover more than one statement but will be listed with only one reference. For example, item 3 above might also reference frameworks statement 1.2c.

Each constructed response item is scored using the appropriate holistic rubric found at http://www.cde.state.co.us/cdeassess/csap/rubrics/as_math_rubrics.htm. More specific scoring guides are provided for review with items that are released to the public. There are also sample student responses for each possible score of an item.
Which clock shows the time 6:50?

[Diagram of four clocks, two of which show the time 6:50]
Look at the table below.

<table>
<thead>
<tr>
<th>Sports Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kind</td>
</tr>
<tr>
<td>Basketballs</td>
</tr>
<tr>
<td>Baseballs</td>
</tr>
<tr>
<td>Kickballs</td>
</tr>
<tr>
<td>Footballs</td>
</tr>
</tbody>
</table>

Use the information from the table to complete the bar graph below.
Marcus has the blocks shown in the picture below.

**Part A**  How many blocks does Marcus have? On the line below, write your answer.

Part B  Marcus gives 10 blocks to a friend. On the picture of blocks, draw a circle around 10 blocks.
Part C  On the line below, write the number sentence Marcus can use to find the number of blocks that remain.

Part D  Look at the number sentence below.

\[ 24 - 13 = \]

In the space below, draw blocks to show this number sentence.
The table below shows the number of hot dogs and the number of hot dog buns there are in different numbers of packages.

### Hot Dogs and Hot Dog Buns

<table>
<thead>
<tr>
<th>Number of Packages</th>
<th>Number of Hot Dogs</th>
<th>Number of Hot Dog Buns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

**Part A**  Complete the table to show the number of hot dogs and the number of hot dog buns in different numbers of packages.

**Part B**  On the lines below, write the rule you used to find the number of hot dogs in the packages.

________________________________________

On the lines below, write the rule you used to find the number of hot dog buns in the packages.

________________________________________
Part C  Kevin is bringing hot dogs and hot dog buns to a picnic. He has 8 packages of hot dogs and 8 packages of hot dog buns. On the lines below, explain how you know that Kevin will not have the same number of hot dogs and hot dog buns.

________________________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________________________

Part D  Kevin has 8 packages of hot dog buns. What is the total number of packages of hot dogs he needs in order to have one hot dog for each hot dog bun? In the space below, show your work and write your answer on the line.

________________________________________________________________________________________________________________________________________________________

_________________________ packages of hot dogs
Two different ways of representing the number 527 are shown below.

\[ 527 = 500 + 20 + 7 \]
\[ 527 = 4 \text{ hundreds} + 11 \text{ tens} + 17 \text{ ones} \]

**Part A**  On the line below, write another way to represent 527.

\[
\underline{527 = \phantom{000} \phantom{000} \phantom{000}}
\]

One way of representing a number is shown below.

\[ 1 \text{ thousand} + 3 \text{ hundreds} + 18 \text{ tens} + 2 \text{ ones} \]

**Part B**  On the line below, write the number that is represented.

\[
\underline{\phantom{000000000}}
\]
Kyle made the figure below with his counters.

Which of these is congruent to Kyle's figure?
Which figure is shaded more than 0.50?

- O 
- O 
- O 
- O 
- O
NAEP Questions and Other Resources

The National Assessment of Educational Progress (NAEP) has tested students nationwide for the last twenty years at grades 4, 8 and 12. Over those years they have developed a resource bank that now contains about 160 release items just for 4th grade. Most of these items are close enough to the Colorado Model Content Standards that they could appear on CSAP tests. The NAEP website not only contains items but a wealth of information about students performance on these items. What follows is a sample of some of these items and also some of the performance information available.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Type</th>
<th>Colorado Standard</th>
<th>Related Information Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>MC</td>
<td>6</td>
<td>Simple and disaggregated performance results</td>
</tr>
<tr>
<td>4</td>
<td>MC</td>
<td>6</td>
<td>Simple performance results</td>
</tr>
<tr>
<td>15</td>
<td>CR</td>
<td>1</td>
<td>Results, scoring guide, student work</td>
</tr>
<tr>
<td>18</td>
<td>CR</td>
<td>1</td>
<td>Scoring guide, results, student work</td>
</tr>
</tbody>
</table>

Disaggregated performance results are available for all release items on the NAEP website. They included not only how certain groups performed, but for multiple choice, they show what percent of students choose each distracter. All constructed response items do contain scoring guides and student work for each score level.

Although the sample selected for this demonstration packet represents only two of the Colorado Standards, all of the Colorado Standards are represented in the NAEP release item bank available to you at the website shown below. This is an excellent source of items for Colorado teachers to use instructionally.

It should be noted that in the last NAEP data release, Colorado students fared very well with our 8th grade results being in the top four states in the nation. At grade 4, Colorado students were slightly above the average.

NAEP Website: http://nces.ed.gov/nationsreportcard/ITMRLS/qtab.asp

In addition, one can visit the Department of Education website for any state and find sample test items. For example the website http://www.ode.state.oh.us/proficiency/Diagnostic_Achievement/materials.asp contains a sample grade 3 mathematics achievement test for the state of Ohio.
Percentage may not add to 100 due to rounding.

These results are for public and nonpublic school students.

Note:

<table>
<thead>
<tr>
<th>Score</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2003 National Performance Results

Subject: Math
Grade: 4
Book: 2003-4MG
No. 11

The National Report Card (Home)

NAEP Questions

NAEP Q4

Performance Data
State Data
NAEP Data
Subject Areas
Help Site Map
Contact Us
Glossary
Newspaper

---

Printable Version

Question
Add Question

Previous Search Results
New Search

To Print Folder Empty

11. SIX students bought exactly enough pens to share equally among themselves. Which of the following could be the number of pens they bought?

(1) 30
(2) 25
(3) 50
(4) 48
(5) 60

---

Descriptor: Given a context, identify a multiple of 6
Subject: Math
Subject Info
Grade: 4
Book: 2003-4MG
No. 11

---

CDE-Student Assessment Unit - 2004-2005 CSAP Demo Packet, Grades 3 and 4 Mathematics -
A word about the options that exist under NAEP questions as shown on the previous page with Item 11. For each item there are six possible responses. Below Basic, Basic, Projected, and Advanced.

Achievement Level

- TOTAL -

Given a context, identify a multiple of 6 in a list of numbers.

National Mathematics Competency/Commodations Performance/Grade 4/2003

Subject Math

NAEP NRAT 2.0 - More Data

Did you use the calculator on this question?

☐ Yes
☐ No

4. Sam placed cookies on a cookie sheet in 2 rows with 6 cookies in each row. Which of the following number sentences best describes this situation?

☐ A) $2 \times 6$
☐ B) $2 + 6$
☐ C) $6 - 2$
☐ D) $6 + 2$

Score

Correct:

Incorrect:

83% Percentage of Students

4% Incorrect

3% Omitted Item

100

Note:

These results are for public and nonpublic school students.

Percentage may not add to 100 due to rounding.
Percentage may not add to 100 due to rounding.

These results are for public and nonpublic school students.

Note:

<table>
<thead>
<tr>
<th>Score</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct</td>
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</tr>
<tr>
<td>Partial</td>
<td>18%</td>
</tr>
<tr>
<td>Incorrect</td>
<td>9%</td>
</tr>
<tr>
<td>OMR Task</td>
<td>1%</td>
</tr>
<tr>
<td>OMR Item</td>
<td>9%</td>
</tr>
</tbody>
</table>

2003 National Performance Results

No: 15

Grade: 4

Subject: Math

Book: 2003-MM

Yes   No

Did you use the calculator on this question?

Drawing:

Sara says 15 of the pencils belong to him. Explain how they both could be right. Use words or pictures.

15. Together, Sara and Brendan have 20 pencils. Sara says 1/4 of the pencils are hers. Brendan

No: 15

Grade: 4

Subject: Math

Book: 2003-MM
representing it as a fraction. The whole amount students were permitted to use a calculator.

In this question, the student was given information in two different ways—a fraction and a

<table>
<thead>
<tr>
<th>Incorrect response (includes 20 - 15 = 5, 5 + 15 = 20, and switching names)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senta has 5.5 must be connected to Senta. It states Sara has 5 because 20 - 15 = 5. So, score is</td>
</tr>
<tr>
<td>Note: Answer must be connected to a fraction. 5 + 15 = 20 is NOT sufficient for a score of 2.</td>
</tr>
<tr>
<td>Demonstrates any one of the following:</td>
</tr>
<tr>
<td>Partial</td>
</tr>
<tr>
<td>Correct Response</td>
</tr>
<tr>
<td>Correct</td>
</tr>
</tbody>
</table>

Score & Description

| 1 | 1 | 1 | 1 | 1 | 1 | 1 |

- Score 1/4 of 5
- Senta + 3/4 + 15

OR
- 1/4 is 5 and 3/4 is 15.

OR
- They can both be right because 1/4 of 20 = 5 and 20 - 5 = 15.

Solution:

Scoring Guide

NAEP 2003-04 - Scoring Guide Key
15. Together, Sara and Brendan have 20 pencils. Sara says 1/4 of the pencils are hers. Brendan says 1/5 of the pencils belonging to him. Explain how they both could be right. Use words or drawings.

Incorrect - Student Response

5 pencils are Sara's.

Partial - Student Response

Correct - Student Response

No. 15  
Book 2003-MIR  
Grade 4  
Subject Math  
NAP 4 V20 -- Student Responses
Shade in the fraction strips below to show two different fractions that are equivalent to the ones shown in A, B, and C.

What do the fractions shown in A, B, and C have in common?

What fraction does this fraction strip show?

What fraction does this fraction strip show?

This fraction strip shows 3/6.

18. The shaded part of each strip below shows a fraction.
Correct division, no shading. Right fraction.
Acceptable responses:

\(\frac{6}{12}\) acceptable (but needs "\(\frac{6}{12}\) since division marks on
right are missing")

2 different responses required, e.g.:

Part 3: Any fraction equivalent to \(\frac{1}{2}\), other than those shown in Part 1.
 Responses 4 and 5:

- They are alike.
- They are different.
- They are all shaded.
- The top number is odd and the bottom number is even.
- They are all long and skinny.
- They are the same.

Unacceptable responses:

The bottom number is twice the top number.
They are all \(\frac{1}{2}\) centimeters long.
They are all at the same place.
They are all the same size.
They are all equal.
They are equivalent fractions.
Part 2: There are many possible answers. e.g.

Response 3:

\(\frac{1}{2} \) or \(\frac{1}{2}\)

Response 2:

Note: If student draws a model for B or C and names it correctly, it will be accepted.

Acceptable form of \(\frac{1}{2}\): one half, \(\frac{1}{2}\), \(\frac{1}{2}\), \(\frac{1}{2}\) or \(\frac{1}{2}\), \(\frac{1}{2}\), \(\frac{1}{2}\), \(\frac{1}{2}\), \(\frac{1}{2}\).

Solution:

There are a total of 5 responses required for this problem.

Scoring Guide

Subject: Math

Grade 4

Book 2003-4M10

NAEP V2.0 -- Scoring Guide/Key
In this question the student needed to demonstrate an understanding of equivalent fractions in the context of a pictorial representation of the fractions. Students were asked to convert both from numerical representations to pictorial representations. To score a correct response, the student must correctly convert the fraction to an equivalent fraction. Any fraction equivalent to 1/2 was scored correct. However, the same fraction cannot receive credit twice.

Note: If a student draws a model for B or C (Response 1 or 2) and names the fraction (it must be equivalent to 1/2) correctly, it was scored correct. However, the same fraction cannot receive credit twice.

Unacceptable Responses:

Right fraction but wrong shading:

Incorrect:

Any 1 or 2 responses correct
Minimal

Any 3 responses correct
Partial

Any 4 responses correct
Satisfactory

All 5 responses correct
Extended

Score & Description

Correct response
PERCENTAGE MAY NOT ADD TO 100 DUE TO ROUNDING.

Note: These results are for public and nonpublic school students.

2003 National Performance Results

<table>
<thead>
<tr>
<th>Score</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended</td>
<td>19%</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>11%</td>
</tr>
<tr>
<td>Partial</td>
<td>21%</td>
</tr>
<tr>
<td>Minimal</td>
<td>36%</td>
</tr>
<tr>
<td>Incorrect</td>
<td>6%</td>
</tr>
<tr>
<td>Correct Item</td>
<td>7%</td>
</tr>
<tr>
<td>Off Task</td>
<td>0%</td>
</tr>
</tbody>
</table>

2003 Grade 4 Math NCEs V2.0 - Performance Data
They are all equivalent fractions.

What do the fractions shown in A, B, and C have in common?

\[ \frac{10}{5} \]
\[ \frac{2}{1} \]

What fraction does this fraction strip show?

A.

B.

C.

This fraction strip shows \( 3/6 \).

18. The shaded part of each strip below shows a fraction.

Extended - Student Response
The shaded part of each strip below shows a fraction.

What fraction does this fraction strip show?

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

\( \frac{1}{2} \)

This fraction strip shows 3/6.

18. The shaded part of each strip below shows a fraction. What fraction does this fraction strip show?
What fraction does this fraction strip show?

$\frac{10}{5}$

What fraction does this fraction strip show?

$\frac{2}{3}$

This fraction strip shows $\frac{3}{6}$.

16. The shaded part of each strip below shows a fraction.

Partial - Student Response

Equivalents to the ones shown in A, B, and C.

Shade in the fraction strips below to show two different fractions that are equivalent.
What fraction does this fraction strip show?

\[ \frac{2}{3} \]

The fraction strip shows 3/6.

16. The shaded part of each strip below shows a fraction.

Minimal - Student Response

You must add two more to each row below.

What do the fractions shown in A, B, and C have in common?
16. The shaded part of each strip below shows a fraction.

Incorrect - Student Response

This fraction strip shows \( \frac{3}{6} \).

Equivalent to the ones shown in A, B, and C.

Shade in the fraction strips below to show two different fractions that are

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

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

What do the fractions shown in A, B, and C have in common?

They are all \( \frac{1}{3} \).

What fraction does this fraction strip show?
Shade in the fraction slips below to show two different fractions that are equivalent to the ones shown in A, B, and C. 

What do the fractions shown in A, B, and C have in common?

A. Show \( \frac{9}{9} \)

B. Show \( \frac{1}{2} \)

C. Show \( \frac{1}{6} \)