Introduction

The state-mandated school closures through the end of the 2019-2020 school year not only changed the way schools delivered instruction but impacted how students were expected to learn grade level and course content. As districts prepare for the 2020-2021 school year, the Department is providing a series of School Readiness Toolkits to help educators reflect on their instructional practices and support them in determining where their students are in their acquisition and retention of knowledge and skills.

Background

The items contained in the School Readiness Toolkits have been selected from the pool of released items from previous spring administrations of the Ohio State Tests. The items are grouped together by Reporting Category and Critical Area of Focus. The collection of items as a whole is not representative of a single test form. The items presented are selected to offer a range of opportunity to work with each reporting category, but do not comprise an actual test statistically. They are chosen to offer a range of experience with items of varying levels of difficulty or complexity.

Items contained in the School Readiness Toolkits are reflective of the 2017 Ohio Learning Standards for Mathematics. All items satisfy the criteria set forth by the grade level/course Test Specifications and the Content Elaborations and Expectations for Learning established by the grade level/course Model Curriculum.

How These Items Can Be Used

The School Readiness Toolkits documents can be used to support instruction in a variety of ways. Districts can choose to administer the:

- Previous grade level School Readiness Toolkits items to acquire data and gather information on student understanding of previous grade level content to begin the new school year;
- Current grade level School Readiness Toolkits items in sections as instructional unit of study pre-assessments based on the grade level/course Critical Areas of Focus or local unit of study;
- Current grade level School Readiness Toolkits items in its entirety;
- Problems may be individually selected for use during local instruction; or
- Problems may be selected for use on local assessments.

How to Identify Released Items

At the bottom of the page for each released item there is a page number and a year. For example: 3 (2018), identifies the item can be found on page 3 of the 2018 Released Item document for the grade level or course. Released Item Scoring Guides for Mathematics are available in the Test Portal in the Student Practice Resources for Mathematics folder under the Student Practice Resources.

The Released Item Release Scoring Guides sample responses and scoring rationales that can help educators plan and deliver instruction by providing example responses for each question along with scoring rationales for each response.

- 2017 Item Release Scoring Guide Grade 3
- 2018 Item Release Scoring Guide Grade 3
- 2019 Item Release Scoring Guide Grade 3
Using Released Test Items to Plan Instruction after COVID-19

The following questions can be answered individually or as a teacher team in the review of the state released items and subsequent reflection on the local curriculum, instructional practices, and assessments (both formative and summative) along with the previous learning opportunities for students.

- What are the math concepts evident in the release item(s)?
  - What is the math a student needs to know in this item?
  - Specifically, what previous grade level standards impact the ability to answer this item?

- What math strategies can a student use to answer the item?
  - Identify examples of how these can be included in your instruction.

- Does the item focus on procedural fluency or conceptual understanding?
  - Procedural Fluency follow-up:
    - What are the procedures and/or skills a student needs to know?
    - What experiences do students have to be prepared to demonstrate this learning?
    - What experiences can be used to move toward the desired outcome(s)?
  - Conceptual Understanding follow-up:
    - What mathematical understanding is evident in the item?
    - What tasks can be used to develop that mathematical understanding?

- Does the item require the student to make connections across standards? If so, what are they?
  - What previous grade level expectations are evident in the item?
  - What experiences can improve the students’ ability to demonstrate these learning expectations?

- Which Standards for Mathematical Practice are most evident in the item?
  - What types of experiences will improve student success?
Preparing for Instruction

Identify a grade level Critical Area of Focus, a mathematical topic of related standards, think about what your typical instruction for this critical area of focus looks like, then determine the changes likely needed to grow all students mathematically.

- What was present in past instruction that helped students perform well?
  - Using the Gap Analysis, Critical Area of Focus, Learning Progressions, and Model Curriculum documents, what previous learning is likely absent or weak?
  - What experiences would support bridging the gap(s)?
  - How could you strengthen the Standards for Mathematical Practice to help support/enhance learning?
  - Specifically, what tasks would be used?

- What does typical instruction include?
  - Models/Representations? What models/representations need introduction?
  - 1-step, 2-step, or Multi-step problems? Is more experience needed? What?
  - Routine and Non-routine problems? Is more experience needed? What?
  - Mathematical and Real-world contexts? Is more experience needed? What rich tasks could incorporate multiple standards?

- Did the mathematical contexts use numbers and operations appropriate for the grade level?
  - How could those numbers be modified to highlight the mathematical understanding needed and increase access for all students?

- Were the real-world contexts familiar or unfamiliar to the students?
  - How do you know?
  - What is needed now?

- Did the instruction allow opportunities for student reasoning and communication?
  - Productive struggle?
  - Student analysis of individual work, thinking and reasoning of others?
  - Descriptions, explanations and justifications?
  - Error analysis and reasonableness of answers?
  - What changes are needed to strengthen the Standards for Mathematical Practice?

- From this analysis, what overall changes are needed in instruction?
  - What instructional strategies should be maintained?
  - What instructional strategies require modification?
  - What needs to happen next to increase learning for all students?
    - Resources
    - Instructional Strategies
    - Professional Development
      - Do I need to seek out professional learning opportunities? What opportunities do I have for growing my own learning? What supports do I have to make these changes?
Grade 3
Reporting Category:

Multiplication and Division

CRITICAL AREA OF FOCUS #1
Developing understanding of multiplication and division and strategies for multiplication and division within 100.
Mrs. Tate arranges 24 desks into rows. Each row has the same number of desks.

Complete the table to show one way that Mrs. Tate could arrange all of the desks into rows.

<table>
<thead>
<tr>
<th>Number of Rows</th>
<th>Number of Desks in Each Row</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Points Possible: 1

Content Cluster: Represent and solve problems involving multiplication and division.

Content Standard: Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as $5 \times 7$. (3.OA.1)
Question 15

Andre wants to plant 72 flowers in a garden.

- The garden should have at least 3 rows of flowers.
- Each row should have the same number of flowers.
- Each row should have at least 3 flowers.

Enter numbers into the table to show two different ways that Andre can plant the flowers.

<table>
<thead>
<tr>
<th>Number of Rows</th>
<th>Number of Flowers in Each Row</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Way</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Second Way</strong></td>
<td></td>
</tr>
</tbody>
</table>

Points Possible: 1

Content Cluster: Represent and solve problems involving multiplication and division.

Content Standard: Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. (Note: These standards are written with the convention that $a \times b$ means $a$ groups of $b$ objects each; however, because of the commutative property, students may also interpret $5 \times 7$ as the total number of objects in 7 groups of 5 objects each). (3.OA.1)

Depth of Knowledge: Level 3  
f. Perform procedure with multiple steps and multiple decision points
Question 24

A girl makes 36 bracelets. She gives an equal number of bracelets to each of her 9 friends.

Which expression shows how many bracelets she gives to each friend?

A. $36 + 9$
B. $36 - 9$
C. $36 \times 9$
D. $36 \div 9$

Points Possible: 1

Content Cluster: Represent and solve problems involving multiplication and division.

Content Standard: Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$. (3.OA.2)
At lunch, there are 48 third-graders. Every table in the lunchroom has the same number of chairs. Every student has a seat and every table is full.

How many tables are needed? Enter the number in the first box.

How many chairs are there at each table? Enter the number in the second box.

- There may be more than one correct answer.

**Number of tables:**

**Number of chairs at each table:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>⅔</td>
</tr>
</tbody>
</table>

**Points Possible:** 1

**Content Cluster:** Represent and solve problems involving multiplication and division.

**Content Standard:** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. See Table 2, page 96. Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.) (3.OA.3)

**Depth of Knowledge:** Level 3

n. Formulate an original problem, given a situation
Question 34

Miss Lewis teaches 3 dance classes. There are 9 students in each class.

How many students does Miss Lewis teach? Enter the number in the box.

Points Possible: 1

Content Cluster: Represent and solve problems involving multiplication and division.

Content Standard: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (3.OA.3)
**Question 42**

Enter the unknown value in each equation.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>×</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 42</td>
</tr>
<tr>
<td></td>
<td>÷</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>=</td>
<td>x</td>
</tr>
<tr>
<td>7</td>
<td>=</td>
<td>14 ÷</td>
</tr>
</tbody>
</table>

**Points Possible:** 2

**Content Cluster:** Represent and solve problems involving multiplication and division.

**Content Standard:** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times \Box = 48$, $5 = \Box \div 3$, $6 \times 6 = \Box$. (3.OA.4)
Question 25

Which expression is equivalent to $3 \times 7$?

- A. $3 + (3 \times 4)$
- B. $3 \times (3 \times 4)$
- C. $(3 \times 3) + (3 \times 4)$
- D. $(3 \times 3) + (4 \times 4)$

Points Possible: 1

**Content Cluster:** Understand properties of multiplication and the relationship between multiplication and division.

**Content Standard:** Apply properties of operations as strategies to multiply and divide. Examples:
If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find $8 \times 7$ as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property) (3.OA.5)
Question 45

An expression is shown.

\[3 \times 4 \times 10\]

Select the two expressions that are equivalent to this expression.

- [ ] \[3 \times 40\]
- [ ] \[30 + 4\]
- [ ] \[12 \times 10\]
- [ ] \[12 \times 40\]
- [ ] \[10 \div 12\]

Points Possible: 1

**Content Cluster:** Understand properties of multiplication and the relationship between multiplication and division.

**Content Standard:** Apply properties of operations as strategies to multiply and divide. For example, if \(6 \times 4 = 24\) is known, then \(4 \times 6 = 24\) is also known (Commutative Property of Multiplication); \(3 \times 5 \times 2\) can be found by \(3 \times 5 = 15\), then \(15 \times 2 = 30\), or by \(5 \times 2 = 10\), then \(3 \times 10 = 30\) (Associative Property of Multiplication); knowing that \(8 \times 5 = 40\) and \(8 \times 2 = 16\), one can find \(8 \times 7\) as \(8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56\) (Distributive Property). Students need not use formal terms for these properties. (3.OA.5)

**Depth of Knowledge:** Level 2

e. Compare and/or contrast figures or statements
Bryson has 40 books. He divides them into 5 stacks with an equal number of books in each stack. He uses the division equation $40 \div 5 = \square$ to find how many books are in each stack.
Enter a multiplication equation that shows the number of books in each stack.

**Points Possible: 1**

**Content Cluster:** Understand properties of multiplication and the relationship between multiplication and division.

**Content Standard:** Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8. (3.OA.6)
Question 12

An equation is given.

72 ÷ 9 = □

Enter a related multiplication equation that shows the missing value.

Points Possible: 1

Content Cluster: Understand properties of multiplication and the relationship between multiplication and division.

Content Standard: Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8. (3.OA.6)

Depth of Knowledge: Level 2
I. Select a procedure according to criteria and perform it
Question 22

What is the quotient of \( 48 \div 6 \)? Enter the number in the box.

Points Possible: 1

Content Strand: Multiply and divide within 100.

Content Standard: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that \( 8 \times 5 = 40 \), one knows \( 40 \div 5 = 8 \)) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. (3.OA.7)
The art teacher has 74 brushes. One art class uses 26 brushes. The rest of the brushes are put into 8 boxes. Each box has the same number of brushes.

How many brushes are in each box?

A 6
B 9
C 40
D 46

Points Possible: 1

Content Cluster: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Content Standard: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (3.OA.8)
Question 13

A group of 9 people is ordering pizza. Each person will get 2 slices of pizza. Each pizza has 6 slices. How many pizzas should the group order? Enter the number in the box.

Points Possible: 1

Content Cluster: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Content Standard: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (3.OA.8)
A pattern is given.

22, 19, 16, ___, 10, 7

What is the missing number in the pattern? Enter the number in the box.

Points Possible: 1

Content Cluster: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Content Standard: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. (3.OA.9)

Depth of Knowledge: Level 2
h. Extend a pattern
Question 29

Jennifer has 4 packages of pens. Each package contains 20 pens.

How many pens does Jennifer have in all? Enter the number in the box.

Points Possible: 1

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of strategies and algorithms may be used.

Content Standard: Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. (3.NBT.3)

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
The number of classes and the number of students in each class at Mountain Elementary School are shown. Complete the table to show the total number of students in each grade.

<table>
<thead>
<tr>
<th></th>
<th>Number of Classes</th>
<th>Number of Students in Each Class</th>
<th>Total Number of Students in Each Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>6</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>First Grade</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Second Grade</td>
<td>4</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Third Grade</td>
<td>3</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Points Possible: 1

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic.

Content Standard: Multiply one-digit whole numbers by multiples of 10 in the range 10–90, e.g., 9 × 80, 5 × 60 using strategies based on place value and properties of operations. (3.NBT.3)
Question 26

There are 9 students in the art club. The teacher gave each student 10 feathers.

What is the total number of feathers that the teacher gave to the students? Enter the number in the box.

Points Possible: 1

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic.

Content Standard: Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. (3.NBT.3)
Grade 3

Reporting Category:

Numbers and Operations

CRITICAL AREA OF FOCUS #5
Solving multi-step problems.
Question 36

What is 761 rounded to the nearest hundred? Enter the number in the box.

Points Possible: 1

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of strategies and algorithms may be used.

Content Standard: Use place value understanding to round whole numbers to the nearest 10 or 100. (3.NBT.1)

Depth of Knowledge: Level 1

g. Perform a specified or routine procedure (e.g. apply rules for rounding)
Question 23

This question has two parts. First, answer part A. Then, answer part B.

A. Round 436 to the nearest 10. Enter the number in the first box.

B. Round 436 to the nearest 100. Enter the number in the second box.

Points Possible: 2

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic.

Content Standard: Use place value understanding to round whole numbers to the nearest 10 or 100. (3.NBT.1)
Question 9

Ryan wrote a number on his paper.

- His number rounds to 350 when rounded to the nearest ten.
- His number rounds to 300 when rounded to the nearest hundred.

Enter a number that Ryan could have written.

Points Possible: 1

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic.

Content Standard: Use place value understanding to round whole numbers to the nearest 10 or 100. (3.NBT.1)
Question 9

An equation is shown.

\[ 263 - 115 - 36 = \square \]

What is the missing number? Enter the number in the box.

Points Possible: 1

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic.

Content Standard: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. (3.NBT.2)
Question 25

Enter a number to complete the equation.

$$166 + \boxed{} = 378$$

Points Possible: 1

Content Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of strategies and algorithms may be used.

Content Standard: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. (3.NBT.2)

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
Question 35

Mr. Burrows starts mowing the lawn at 12:05 p.m. He also does the following

- He stops to eat lunch 45 minutes after he starts mowing the lawn.
- After lunch, he mows the lawn for 35 more minutes.
- He finishes mowing the lawn at 1:45 p.m.

A. What time does Mr. Burrows begin eating lunch?

B. How long, in minutes, did it take him to eat lunch?

A. ______ : ______ p.m.
B. ______ minutes

Points Possible: 2

Content Cluster: Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

Content Standard: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. (3.MD.1)
Molly and Janet have beakers of the same size. The beakers are filled with different amounts of water as shown.

Janet’s beaker contains 7 milliliters (mL) of water.

About how many milliliters of water does Molly’s beaker contain?

A  2 mL  
B  5 mL  
C  7 mL  
D  9 mL

Points Possible: 1

Content Cluster: Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

Content Standard: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3.MD.2)
Question 21

A student is comparing the mass of four bananas to the mass of four apples.

What is the difference in mass, in grams (g), between the bananas and the apples?

A) 200 g
B) 500 g
C) 700 g
D) 1,200 g

Points Possible: 1

Content Cluster: Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

Content Standard: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3.MD.2)
Rachel, Liam, and Kiaan are stacking blocks. They want to see who can build the tallest tower of blocks without it falling over. They each record their number of blocks on the graph shown.

How many total blocks did Rachel, Liam, and Kiaan use to build their towers?

- A 130
- B 160
- C 170
- D 180
Points Possible: 1

Content Cluster: Represent and interpret data.

Content Standard: Create scaled picture graphs to represent a data set with several categories. Create scaled bar graphs to represent a data set with several categories. Solve two-step “how many more” and “how many less” problems using information presented in the scaled graphs. For example, create a bar graph in which each square in the bar graph might represent 5 pets, then determine how many more/less in two given categories. (3.MD.3)

Depth of Knowledge: Level 2
i. Retrieve information from a table, graph, or figure and use it to solve a problem requiring multiple steps
Yang has an apple tree. He records how many apples he picks each day in the table shown.

<table>
<thead>
<tr>
<th>Number of Apples Picked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
</tr>
<tr>
<td>Friday</td>
</tr>
</tbody>
</table>

Create a picture graph to represent the data.

A. Select a number for the scale of the picture graph.

B. Select apples in each row to create the picture graph.

- There may be more than one correct answer.

**Points Possible: 1**

**Content Cluster:** Represent and interpret data.

**Content Standard:** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. (3.MD.3)
Question 7

The graph shows the colors of students’ backpacks in a third-grade class.

**Colors of Backpacks**

<table>
<thead>
<tr>
<th>Color</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>10</td>
</tr>
<tr>
<td>Blue</td>
<td>6</td>
</tr>
<tr>
<td>Gray</td>
<td>7</td>
</tr>
<tr>
<td>Purple</td>
<td>2</td>
</tr>
<tr>
<td>Red</td>
<td>2</td>
</tr>
</tbody>
</table>

How many more students have black backpacks than have blue backpacks? Enter the number in the box.

Points Possible: 1

**Content Cluster:** Represent and interpret data.

**Content Standard:** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. (3.MD.3)
Grade 3
Reporting Category:
Geometry

CRITICAL AREA OF FOCUS #3
Developing understanding of the structure of rectangular arrays and of area.

CRITICAL AREA OF FOCUS #4
Describing and analyzing two-dimensional shapes.
Question 48

A diagram is shown.

Which measure would be found by counting all the unit squares in the rectangle?

A  area  
B  length  
C  volume  
D  perimeter

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Content Standard: Recognize area as an attribute of plane figures and understand concepts of area measurement. (3.MD.5)
b. A plane figure which can be covered without gaps or overlaps by $n$ unit squares is said to have an area of $n$ square units.

Depth of Knowledge: Level 1
a. Recall, observe, or recognize a fact, definition, term, or property
Select the **three** shapes that each have an area of 16 square feet.
Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Content Standard: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). (3.MD.6)

Depth of Knowledge: Level 2
  c. Use models to represent mathematical concepts
  d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
Question 1

A rectangle is shown.

What is the area, in square meters, of the rectangle? Enter the number in the box.

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Content Standard: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). (3.MD.6)
Question 41

Select the two rectangles that have an area of 12 square units.

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Content Standard: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). (3.MD.6)
Question 22

Which area model represents the expression \((3 \times 6) + (3 \times 5)\)?

A. 

B. 

C. 

D. 

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Content Standard: Relate area to the operations of multiplication and addition. (3.MD.7)
c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths \(a\) and \(b + c\) is the sum of \(a \times b\) and \(a \times c\) (represent the distributive property with visual models including an area model).

Depth of Knowledge: Level 2
c. Use models to represent mathematical concepts
Question 32

A rectangle has a width of 6 feet and an area of 48 square feet.

What is the length, in feet, of the rectangle? Enter the number in the box.

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Content Standard: Relate area to the operations of multiplication and addition. (3.MD.7)
b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
A girl walks around the perimeter of a park, as shown.

What is the perimeter, in meters (m), of the park? Enter the number in the box.

\[ \text{meters} \]

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Points Possible: 1

Content Cluster: Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Content Standard: Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. (3.MD.8)

Depth of Knowledge: Level 1
d. Determine the area or perimeter of rectangles or triangles given a drawing and labels
An artist made a poster that is 6 feet tall and 4 feet wide.

What is the perimeter, in feet, of the poster? Enter the number in the box.

feet
Carl creates a rectangle with an area of 12 square units and a perimeter of 14 units.

A. In the top box, use the Connect Line tool to create a rectangle with
   • the same area as Carl's rectangle, but
   • a different perimeter.

B. In the bottom box, use the Connect Line tool to create a rectangle with
   • the same perimeter as Carl’s rectangle, but
   • a different area.

Points Possible: 2

**Content Cluster:** Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

**Content Standard:** Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. (3.MD.8)
Question 47

A shape is shown.

Select the two words that describe this shape.

- triangle
- hexagon
- rectangle
- pentagon
- quadrilateral

Points Possible: 1

Content Cluster: Reason with shapes and their attributes.

Content Standard: Draw and describe triangles, quadrilaterals (rhombuses, rectangles, and squares), and polygons (up to 8 sides) based on the number of sides and the presence or absence of square corners (right angles). (3.G.1)

Depth of Knowledge: Level 1
a. Recall, observe, or recognize a fact, definition, term, or property
Question 24

A shape is divided into equal parts as shown.

Enter a fraction that represents the shaded area of the shape.

Points Possible: 1

Content Cluster: Reason with shapes and their attributes.

Content Standard: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as \( \frac{1}{4} \) of the area of the shape. (3.G.2)
Grade 3
Reporting Category:

Fractions

CRITICAL AREA OF FOCUS #2
Developing understanding of fractions, especially unit fractions (fractions with numerator 1).
Question 31

Which stick has a length of $\frac{1}{2}$ inch?

A

B

C

D

Points Possible: 1

Content Cluster: Represent and interpret data.

Content Standard: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by creating a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3.MD.4)

Depth of Knowledge: Level 1
f. Measure
Question 10

Complete the sentence to create a true statement about the fraction $\frac{1}{3}$.

The fraction $\frac{1}{3}$ describes □ □ when a whole is divided into □ □

Drop down choices:

Points Possible: 1

Content Cluster: Develop understanding of fractions as numbers. Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.

Content Standard: Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $a/b$ as the quantity formed by a parts of size $1/b$. (3.NF.1)

Depth of Knowledge: Level 2

m. Specify and explain relationships between facts, terms, properties, or operations
Question 8

A girl has the candy bar shown.

She breaks it into thirds. She gives \(\frac{1}{3}\) of the candy bar to a friend.

Which model shows the fraction of the candy bar the girl has left?

A

B

C

D

Points Possible: 1

Content Cluster: Develop understanding of fractions as numbers.

Content Standard: Understand a fraction 1 as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction \(\frac{a}{b}\) as the quantity formed by a parts of size \(\frac{1}{b}\). (3.NF.1)
Question 2

A fraction model is shown.

A. What fraction represents the shaded area of the fraction model?
B. Explain how you found your answer.
Type your answer in the space given.

Points Possible: 2

Content Cluster: Develop understanding of fractions as numbers.

Content Standard: Understand a fraction \( \frac{1}{b} \) as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction \( \frac{a}{b} \) as the quantity formed by a parts of size \( \frac{1}{b} \). (3.NF.1)
**Question 40**

Move the two points to the number line to correctly plot the fraction $\frac{1}{3}$.

**Points Possible:** 2

**Content Cluster:** Develop understanding of fractions as numbers.

**Content Standard:** Understand a fraction as a number on the number line; represent fractions on a number line diagram.

*b.* Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off a lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $a$ and that its endpoint locates the number $\frac{1}{b}$ on the number line. (3.NF.2b)
Question 42

Points Possible: 2

Content Cluster: Develop understanding of fractions as numbers.

Content Standard: Understand a fraction as a number on the number line; represent fractions on a number line diagram. (3.NF.2)
b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
Question 42

Which number line shows point V located at $\frac{1}{6}$?

A

B

C

D

Points Possible: 1

Content Cluster: Develop understanding of fractions as numbers. Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.

Content Standard: Understand a fraction as a number on the number line; represent fractions on a number line diagram. (3.NF.2)

a. Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into $b$ equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line.

d. Use models to represent mathematical concepts
This item has three parts.

**Part A.** Create models for two different fractions that are greater than 1.

**Key**

![Key Image]

**Fraction 1**

![Fraction 1 Image]

**Fraction 2**

![Fraction 2 Image]

**Part B.** Select the words that correctly complete each sentence.

- Fraction 1 has □ parts of the wholes shaded than Fraction 2.
- The parts in Fraction 1 are □ the parts in Fraction 2.
- Fraction 1 is □ Fraction 2.

**Part C.** Which statement correctly compares the two fractions?

- A. Fraction 1 > Fraction 2
- B. Fraction 1 = Fraction 2
- C. Fraction 1 < Fraction 2
Drop down choices:

- Fraction 1 has [ ] parts of the whole shaded than Fraction 2.
  [more] [fewer]

- The parts in Fraction 1 are [ ] the parts in Fraction 2.
  [the same size is] [larger than] [smaller than]

- Fraction 1 is [ ] Fraction 2.
  [greater than] [less than]

Points Possible: 2

**Content Cluster:** Develop understanding of fractions as numbers. Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.

**Content Standard:** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. (3.NF.3)

d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

**Depth of Knowledge:** Level 3
d. Use evidence to develop logical arguments for a concept
k. Solve a multiple-step problem and provide support with a mathematical explanation that justifies the answer
Question 13

This item has two parts.

Vince wants to find a fraction that is equivalent to $\frac{2}{4}$. He creates the first model, as shown.

**Part A.** Select parts of the second model so that the two models represent equal fractions.

**Part B.** Based on the second model, what fraction is equivalent to $\frac{2}{4}$?
Points Possible: 2

Content Cluster: Develop understanding of fractions as numbers.

Content Standard: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. (3.NF.3)