Colorado Measures of Academic Success

Grade 3 Mathematics

Paper Practice Resource for Students

1. What is the value of 6×80?

Ⓐ 360

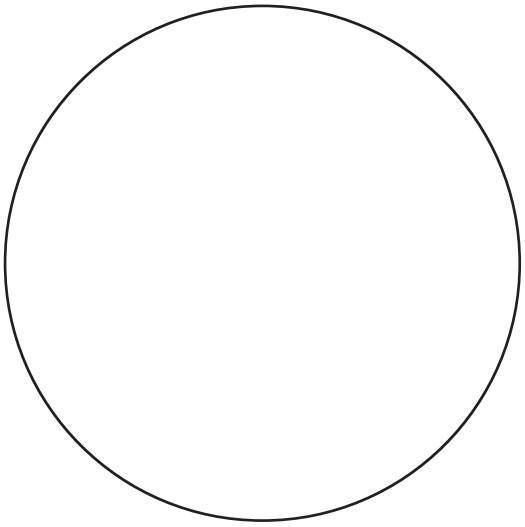
Ⓑ 420

Ⓒ 480

Ⓓ 490

2. Create a model of a fraction to show $\frac{1}{4}$ shaded.

Divide the circle into the correct number of equal parts. Then show your answer by shading the part or parts.



3. There are 8 people. They each have 4 oranges.

Which expression shows how many oranges the people have altogether?

Ⓐ $8 + 4$

Ⓑ $8 - 4$

Ⓒ 8×4

Ⓓ $8 \div 4$

Use the information provided to answer Part A through Part C for question 4.

A teacher and her class collected books.

- Group A collected 334 books.
- Group B collected 407 books.
- The teacher collected 26 books.

4. Part A

Which comparison correctly compares the number of books collected?

Select the **three** correct comparisons.

Ⓐ $407 < 334$

Ⓑ $26 > 407$

Ⓒ $26 < 334$

Ⓓ $407 > 334$

Ⓔ $26 < 407$

Ⓕ $26 > 334$

Part B

Identify the correct number of 100s, 10s, and 1s to show the total amount of books Group A collected.

Write the correct number of 100s, 10s, and 1s next to the picture for each value.

_____

10 books

_____

1 book

_____

Part C

A bookstore gave the class an additional 32 books. The teacher placed all the books together.

- Write an equation or equations that could be used to find the total number of books, including the books from the bookstore.
- Include the total number of books.
- Write the total number of books collected in expanded form.
- Explain or show how many groups of 100s, 10s, and 1s of books the teacher would have after placing all the books together.

Enter your equation or equations, your answers, and your work or explanation in the space provided.

5. Student A eats $\frac{3}{8}$ of a candy bar. Student B eats $\frac{3}{6}$ of the same-sized candy bar.

Complete the sentence to compare the fraction of the candy bar each student eats.

Circle the answer options to correctly complete the sentence.

Student A eats _____ fraction of a candy bar

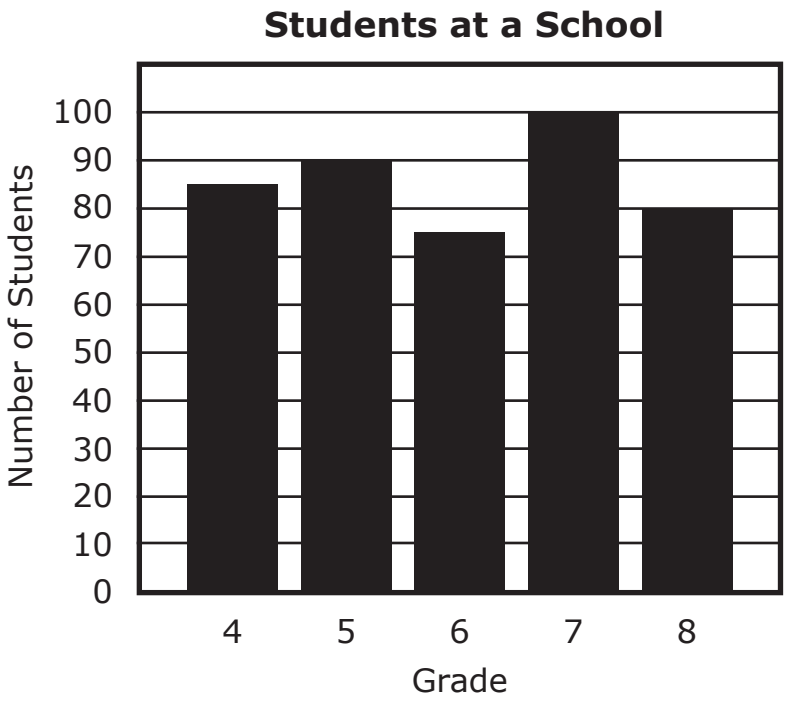
a smaller
a larger
an equal

than Student B, because $\frac{3}{6}$ ___ $\frac{3}{8}$.

>
<
=

Use the information provided to answer Part A and Part B for question 6.

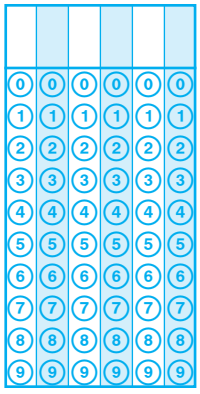
The bar graph shows the number of students in each grade at a school.



6. Part A

How many more students are in grade 7 than are in grade 4?

Enter your answer in the box.



Part B

How many more students are in grade 5 and grade 8 together than are in grade 6?

Ⓐ 115

Ⓑ 105

Ⓒ 95

Ⓓ 85

7. A total of 80 books were sent to 8 schools. Each school gets the same number of books.

How many books does each school get?

Ⓐ 8

Ⓑ 9

Ⓒ 10

Ⓓ 11

8. There are 309 third graders at a school.

There are 412 fourth graders at the same school.

A student wants to find how many more fourth graders there are than third graders.

The student says that there are 117 more fourth graders than third graders. The student's reasoning is that subtraction gives $9 - 2 = 7$ in the ones place, $1 - 0 = 1$ in the tens place, and $4 - 3 = 1$ in the hundreds place.

- Explain the mistake in the student's reasoning.
- Explain how to correct the mistake. Include the answer in your explanation.
- Find the total number of third and fourth graders. Show your work.

Enter your explanations, your answers, and your work in the space provided.

9. Multiply or divide to complete each equation.

Enter your answers in the spaces provided. Enter **only** your answers.

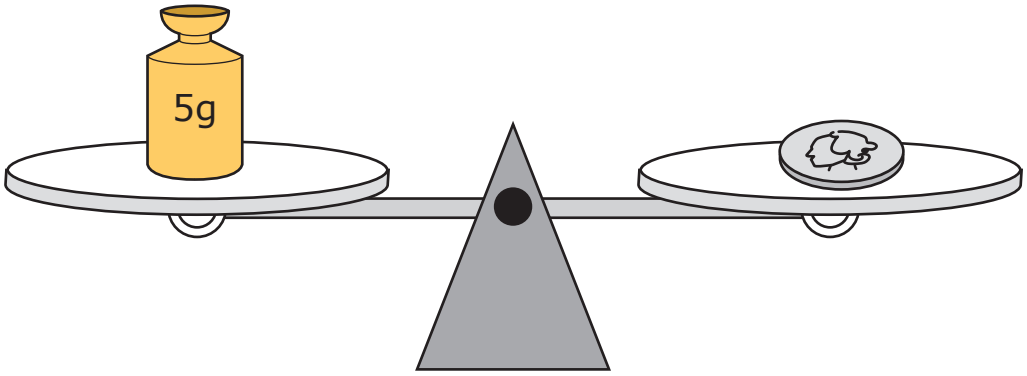
$3 \times 4 \quad = \quad$ _____

$12 \div 2 \quad = \quad$ _____

$18 \div 2 \quad = \quad$ _____

$3 \times 8 \quad = \quad$ _____

10. One side of a scale holds grams, and the other side of the scale holds a coin. The scale is balanced.

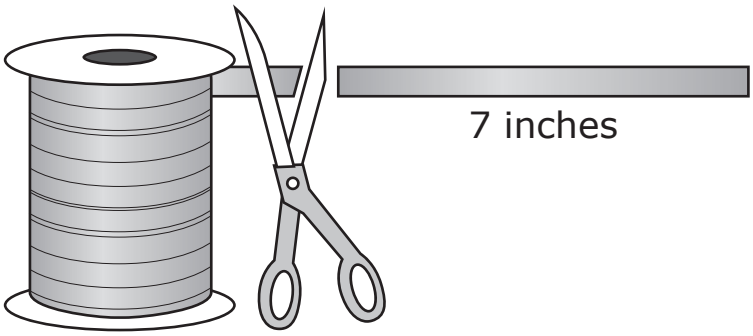


What is the mass, in grams, of 9 coins?

Enter your answer in the box.

11. A student is cutting ribbon into strips of equal length.

- The student has a total of 119 inches of ribbon.
- The student cuts the ribbon into 7-inch strips.
- The student has already cut 9 strips of ribbon.



The student wants to know how many more 7-inch strips of ribbon can be cut.

- Explain or show how to find the number of 7-inch strips the student can cut out of the ribbon still left over.
- How many more 7-inch strips can the student cut?

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

This is the end of Item Set 1.

1. Find the missing length, width, or perimeter for each rectangle in the table.

Write a number from the list in each blank.

2	5	7	12	13	14

	Length (inches)	**Width (inches)**	**Perimeter (inches)**
Rectangle A	4	3	
Rectangle B		8	20
Rectangle C	3		16

Use the information provided to answer Part A and Part B for question 2.

A teacher is making a rectangular reading space for students in a classroom.

2. Part A

There are three different ways the teacher can make the reading space. The table is missing some of the information needed.

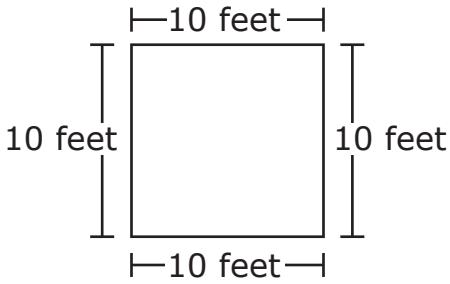
Write a number from the list shown into each spot on the table. Each number may be used once, more than once, or not at all.

4	7	8	13	27	42

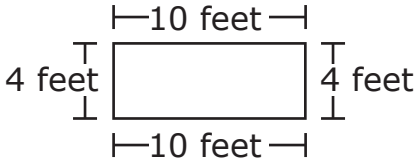
	Length (feet)	**Width (feet)**	**Area (square feet)**
Reading Space 1		9	36
Reading Space 2	7	6	
Reading Space 3	8		64

Part B

The students make two different drawings of a reading space. The students think each reading space has an area of 40 square feet.



Drawing 1



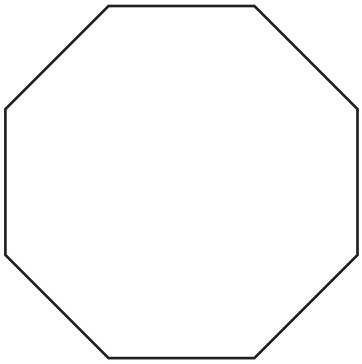
Drawing 2

- Explain whether each drawing shows an area of 40 square feet.
- Explain a different way the reading space can have an area of 40 square feet.

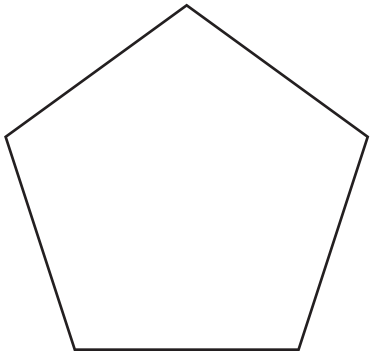
Enter your explanations in the space provided.

3. Which shape is a quadrilateral?

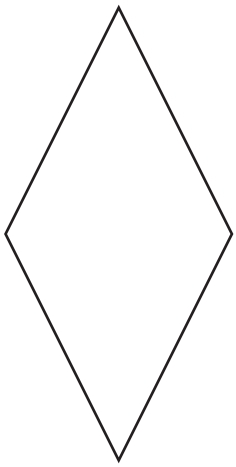
Ⓐ



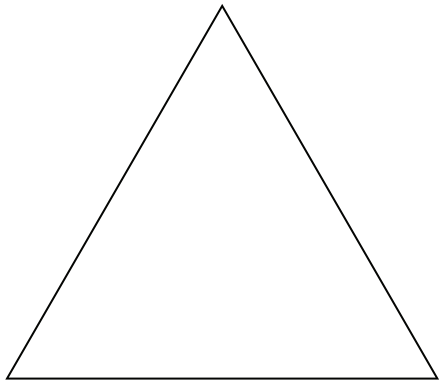
Ⓑ



Ⓒ



Ⓓ



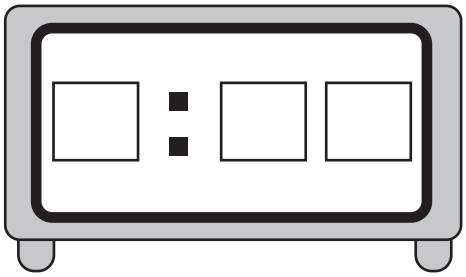
4. A student practices the piano for 35 minutes. He starts practice at 6:15.

What time will he end practice?

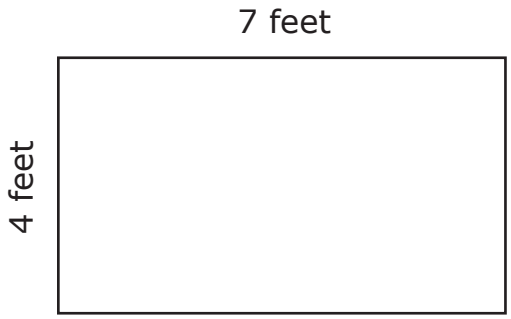
Write a number from the list in each blank to show the correct end time on the clock. Each number may be used once, more than once, or not at all.

0	**1**	**2**	**3**	**4**

5	**6**	**7**	**8**	**9**

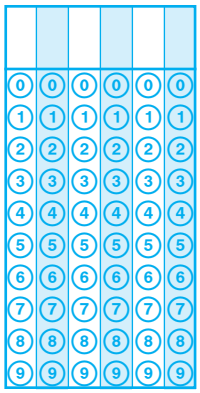


5. The diagram shows a rectangular tabletop.



What is the area, in square feet, of the tabletop?

Enter your answer in the box.



6. What could the expression $27 \div 3$ stand for?

Ⓐ There are 3 cows that leave a group of 27 cows.

Ⓑ There are 3 cows that join a group of 27 cows.

Ⓒ There are 27 groups with 3 cows each.

Ⓓ There are 27 cows in 3 equal groups.

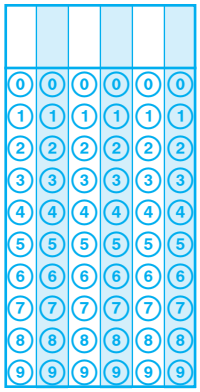
Use the information provided to answer Part A and Part B for question 7.

A worker puts together baskets of fruit. He has a total of 63 pieces of fruit. He places 7 pieces of fruit in each basket.

7. Part A

There are 3 oranges in each basket. How many oranges are there in total?

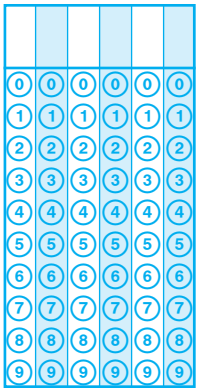
Enter your answer in the box.



Part B

The worker sells 2 baskets of fruit. How many pieces of fruit does the worker have left in the remaining baskets?

Enter your answer in the box.



8. What is the value of 537 – 368?

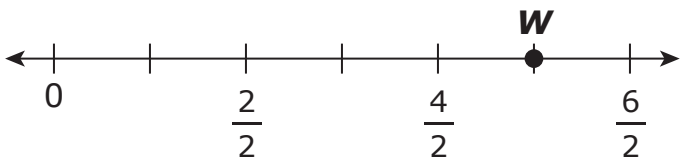
Ⓐ 169

Ⓑ 179

Ⓒ 249

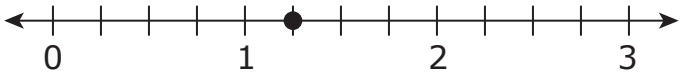
Ⓓ 269

9. Point *W* is shown at $\frac{5}{2}$ on the number line.

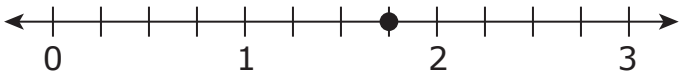


Which number line shows a fraction equivalent to $\frac{5}{2}$?

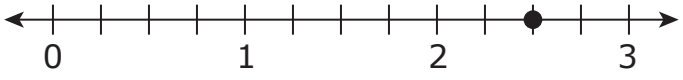
Ⓐ



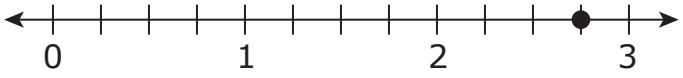
Ⓑ



Ⓒ



Ⓓ



This is the end of Item Set 2.

Colorado Measures of Academic Success

Grade 3 Mathematics

Answer Key with Scoring Rubrics

Practice Resource for Students

1139070 1 2 3 4 5 A B C D E Printed in the USA ISD36175

ANSWER KEY: ITEM SET 1

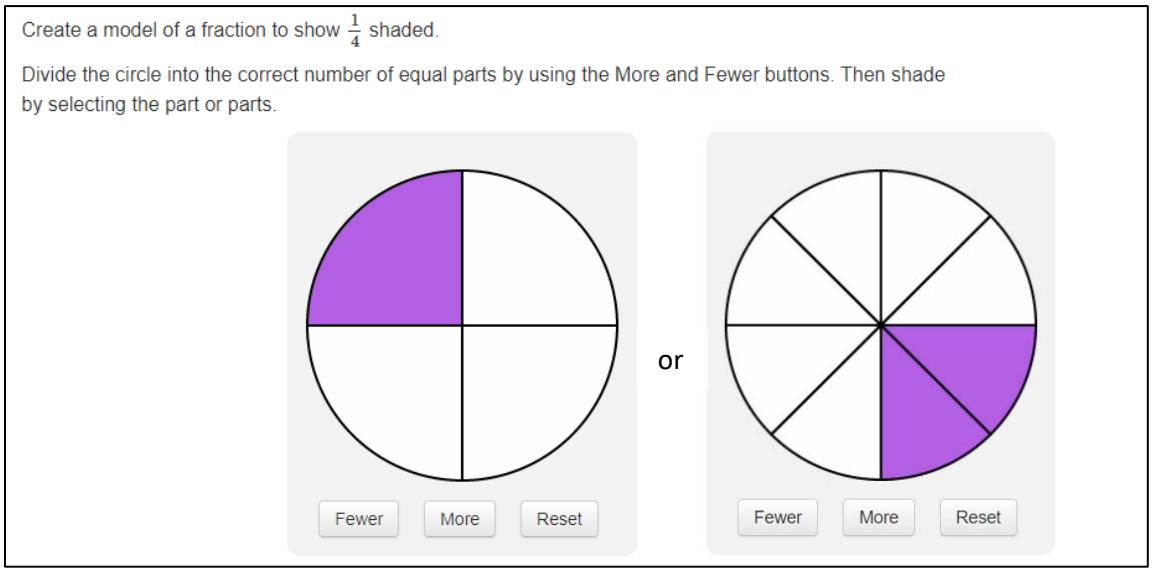
Item Set 1 - Question 1 (Selected Response)

What is the value of 6×80?

- A. 360
- B. 420
- C. 480 (selected)
- D. 490

Item Information		
Answer:	C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.NBT.A.3	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.
Evidence Statement:	3.NBT.3	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.
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.644	

Item Set 1 – Question 2 (Selected Response)



Item Information		
Answer:	See Image Examples Note: other valid approaches are acceptable	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.G.A.2	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 1/4 of the area of the shape.
Evidence Statement:	3.G.2	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 1/4 of the area of the shape.
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.903	

Item Set 1 – Question 3 (Selected Response)

There are 8 people. They each have 4 oranges.

Which expression shows how many oranges the people have altogether?

- A. $8 + 4$
- B. $8 - 4$
- C. 8×4
- D. $8 \div 4$

Item Information		
Answer:	C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.A.3	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.
Evidence Statement:	3.OA.1	Use multiplication within 100 (both factors less than or equal to 10) to solve word problems in situations involving equal groups, arrays, or area, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.761	

Item Set 1 – Question 4 (Multiple Select, TEI Drag and Drop, Constructed Response)

A teacher and her class collected books.

- Group A collected 334 books.
- Group B collected 407 books.
- The teacher collected 26 books.

Part A

Which comparison correctly compares the number of books collected?

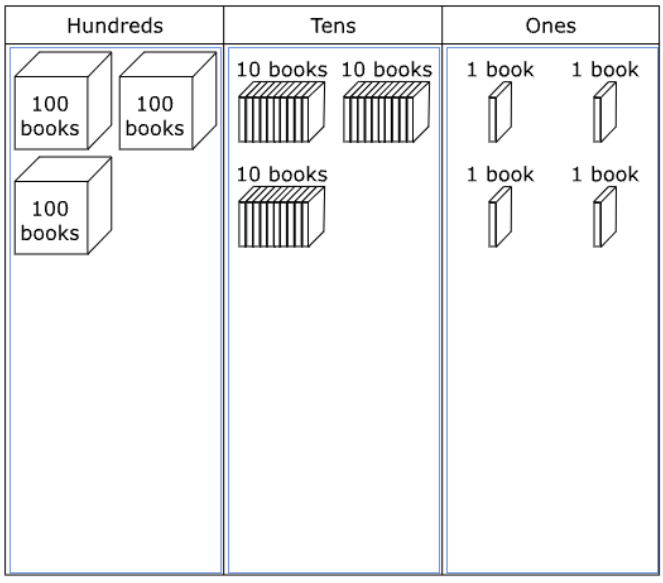
Select the **three** correct comparisons.

- [ ] A. $407 < 334$
- [ ] B. $26 > 407$
- [x] C. $26 < 334$
- [x] D. $407 > 334$
- [x] E. $26 < 407$
- [ ] F. $26 > 334$

Part B

Place the correct number of 100s, 10s, and 1s to show the total amount of books Group A collected.

Drag and drop each 100s, 10s, and 1s into the correct space. Each item may be used once, more than once, or not at all.



Part C

A bookstore gave the class an additional 32 books. The teacher placed all the books together.

- Write an equation or equations that could be used to find the total number of books, including the books from the bookstore.
- Include the total number of books.
- Write the total number of books collected in expanded form.
- Explain or show how many groups of 100s, 10s, and 1s of books the teacher would have after placing all the books together.

Enter your equation or equations, your answers, and your work or explanation in the space provided.

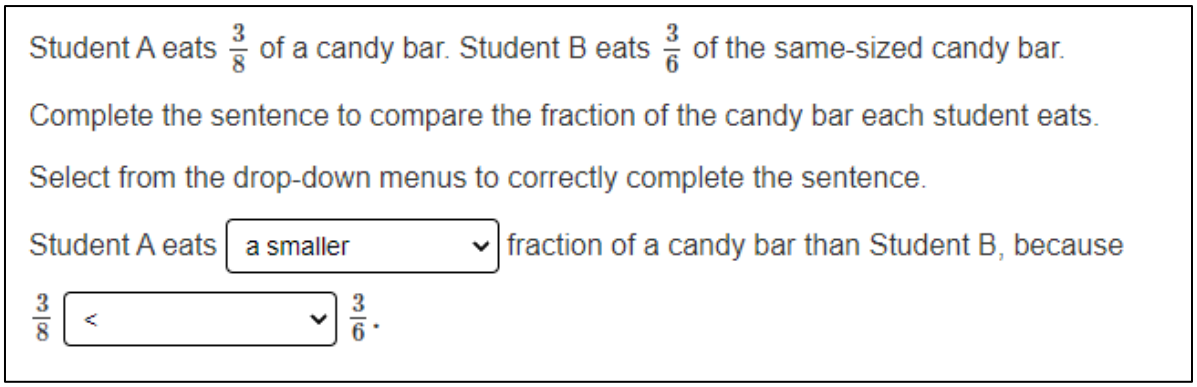
Item Information		
Answer:	Part A: C, D, E Part B: See Image, 3 hundreds (100s), 3 tens (10s), and 4 ones (1s). Part C: See Scoring Rubric	
Colorado Academic Standards (CAS) Evidence Outcomes:	2.NBT.A.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
	2.NBT.A.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
Evidence Statement:	3.D.2	Solve multi-step contextual problems with degree of difficulty appropriate to Grade 3, requiring application of knowledge and skills articulated in 2.OA.A, 2.OA.B, 2.NBT, and/or 2.MD.B.
Subclaim:	D - Modeling and Application	The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them (MP. 1) ,reasoning abstractly and quantitatively (MP. 2), using appropriate tools strategically (MP.5), looking for and making use of structure (MP.7), and/or looking for and expressing regularity in repeated reasoning (MP.8).
P Value:	0.326	

Scoring Rubric – Part A (Machine Scored)	
Points	**Attributes**
1	**Computation Component:** Student provides the three correct comparisons: Selects C. 26 < 334 Selects D. 407 >334 Selects E. 26 < 407
0	Student response is incorrect.

Scoring Rubric – Part B (Machine Scored)	
Points	**Attributes**
1	**Computation Component:** Student provides the correct number of 100s, 10s, 1s: Hundreds column: 3 blocks of 100 books Tens column: 3 blocks of 10 books Ones column: 4 blocks of 1 book
0	Student response is incorrect.

Scoring Rubric – Part C	
Points	**Attributes**
4	Student response includes each of the following 4 elements. • **Modeling component**: The student provides a valid equation or equations that model the total number of books, including the books from the bookstore. • **Computation component**: Correct total number of books collected, including the books from the bookstore, 799. • **Modeling component**: The student writes the total number of books collected in valid expanded form. • **Computation component**: The student explains or show how many groups of 100's, 10's, and 1's are in the total number of books collected.
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.
Sample Student Response:	334 + 407 = 741, 741 + 26 = 767, 767 + 32 = 799. The total amount of books is 799. 700 + 90 + 9 = 799. The teacher would have 7 hundreds, 9 tens, and 9 ones.
Annotation for Sample Student Response:	**Score Point 4** The response receives full credit. It includes each of the four required elements. **Modeling Component:** • **Student Response:** 334 + 407 = 741, 741 + 26 = 767, 767 + 32 = 799. o **Rationale for Score:** The student provides valid equations that model the total number of books, including the books from the bookstore (334 + 407 = 741, 741 + 26 = 767, 767 + 32 = 799). **Computation Component:** • **Student Response:** The total amount of books is 799. o **Rationale for score:** The correct total number of books collected, including the books from the bookstore is provided (799). **Modeling Component:** • **Student Response:** 700 + 90 + 9 = 799. o **Rationale for Score:** The student writes the total number of books collected in valid expanded form (700 + 90 + 9). **Computation Component:** • **Student Response:** The teacher would have 7 hundreds, 9 tens, and 9 ones. o **Rationale for score:** The student explains how many groups of 100's, 10's, and 1's are in the total number of books collected (7 hundreds, 9 tens, and 9 ones). **Note:** Sample student responses are not representative of all correct answers for an item and are only provided as a guide to assist teachers with scoring.

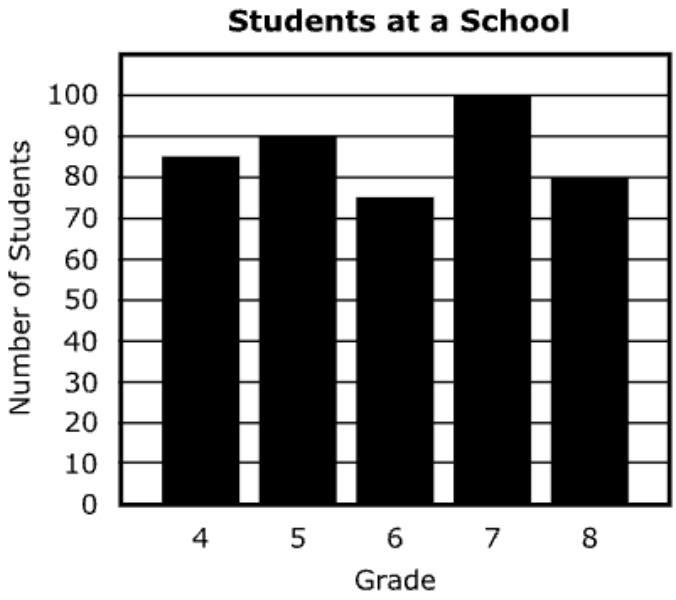
Item Set 1 – Question 5 (TEI Inline Choice)



Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.NF.A.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 <.
Evidence Statement:	3.NF.3d	Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. 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.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.529	

Item Set 1 – Question 6 (Fill in the Blank, Selected Response)

The bar graph shows the number of students in each grade at a school.



Part A

How many more students are in grade 7 than are in grade 4?

Enter your answer in the box.

15

Part B

How many more students are in grade 5 and grade 8 together than are in grade 6?

- A. 115
- B. 105
- C. 95
- D. 85

Item Information		
Answer:	Part A: See Image Part B: C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.B.3	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.
	3.NBT.A.2	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.
Evidence Statement:	3.Int.4	Use information presented in a scaled bar graph to solve a two-step “how many more” or “how many less” problem requiring a substantial addition, subtraction, or multiplication step, drawing on knowledge and skills articulated in 3.NBT. Content Scope: 3.MD.3, 3.NBT.2, and 3.NBT.3
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.51	

Item Set 1 – Question 7 (Selected Response)

A total of 80 books were sent to 8 schools. Each school gets the same number of books.

How many books does each school get?

- A. 8
- B. 9
- C. 10 (selected)
- D. 11

Item Information		
Answer:	C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.A.3	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.
Evidence Statement:	3.OA.3-3	Use division within 100 (quotients related to products having both factors less than or equal to 10) to solve word problems in situations involving equal groups, arrays, or area, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.856	

Item Set 1 – Question 8 (Constructed Response)

There are 309 third graders at a school.

There are 412 fourth graders at the same school.

A student wants to find how many more fourth graders there are than third graders.

The student says that there are 117 more fourth graders than third graders. The student's reasoning is that subtraction gives $9 - 2 = 7$ in the ones place, $1 - 0 = 1$ in the tens place, and $4 - 3 = 1$ in the hundreds place.

- Explain the mistake in the student's reasoning.
- Explain how to correct the mistake. Include the answer in your explanation.
- Find the total number of third and fourth graders. Show your work.

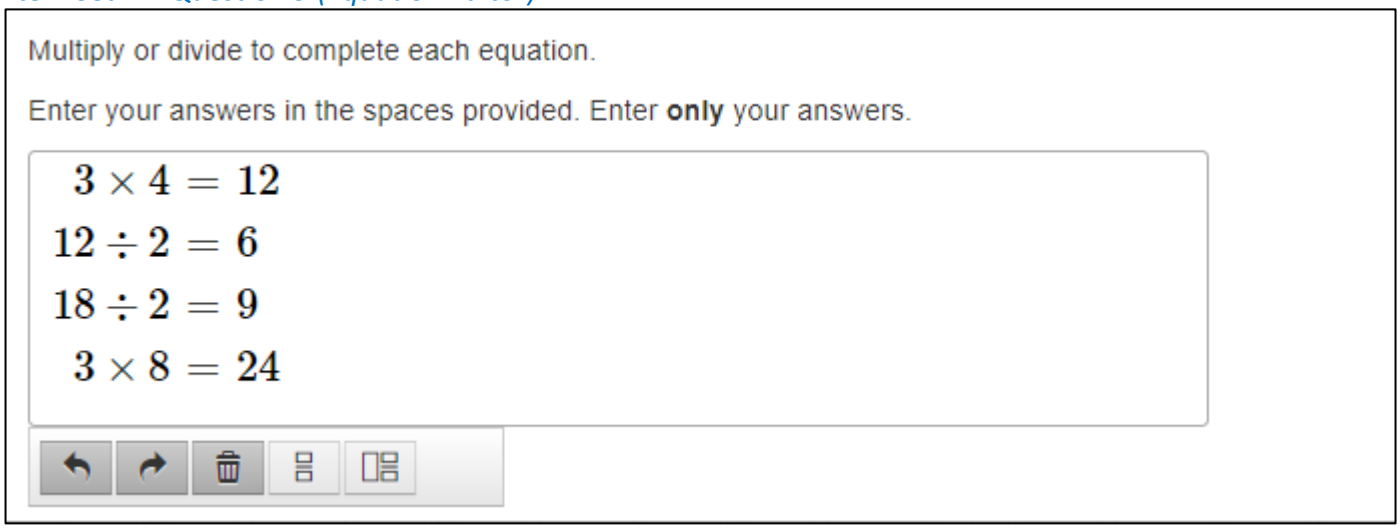
Enter your explanations, your answers, and your work in the space provided.

Item Information		
Answer:	See Scoring Rubric	
Colorado Academic Standards (CAS) Evidence Outcomes:	2.NBT.B.7	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones, and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
Evidence Statement:	3.C.4-7	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 2.NBT
Subclaim:	C - Expressing Mathematical Reasoning	The student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others, and/or attending to precision when making mathematical statements.
P Value:	0.188	

Scoring Rubric	
Points	**Attributes**
4	Student response includes each of the following 4 elements. • **Reasoning component**: Valid explanation of the mistake in student's reasoning • **Reasoning component:** Valid explanation of how to correct the mistake; including the correct difference in number of third and fourth grade students, 103 • **Reasoning component:** Valid explanation or work to find the total number of third and fourth grade students • **Computation component**: Correct total number of third and fourth grade students, 721
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.

Sample Student Response:	**Sample Solution 1:** The mistake in the student's reasoning is that in the one's place they subtracted 9 – 2 = 7 instead of 2 – 9. In order to fix the mistake, you must use regrouping instead of just reversing the equation. The student can regroup 1 tens and 2 ones to make 0 tens and 12 ones. Then, the student can do 12 – 9 = 3, then move to the tens place and do 0 – 0 = 0. Finally, you go to the hundreds place and do 4 – 3 = 1. There are 103 more 4^{th} grades than 3^{rd} graders, 412 – 309 = 103. The total number of third and fourth graders is 721. 309 + 412 = 721.
Annotation for Sample Student Response:	**Solution 1, Score Point 4** The response receives full credit. It includes each of the 4 required elements. **Reasoning Component:** • **Student Response:** The mistake in the student's reasoning is that in the one's place they subtracted 9 – 2 = 7 instead of 2 – 9. ○ **Rationale for Score:** The student provided a valid explanation of the mistake made by identifying the incorrect reversed subtraction in the one's place (9 – 2 = 7) as compared to the correct order of subtraction (instead of 2 – 9). **Reasoning Component:** • **Student Response:** In order to fix the mistake, you must use regrouping instead of just reversing the equation. The student can regroup 1 tens and 2 ones to make 0 tens and 12 ones. Then, the student can do 12 – 9 = 3, then move to the tens place and do 0 – 0 = 0. Finally, you go to the hundreds place and do 4 – 3 = 1. There are 103 more 4^{th} graders than 3^{rd} graders, 412 – 309 = 103. ○ **Rationale for score:** The student provided a valid explanation of how to correct the mistake made by identifying that you must use regrouping and then showing how to find the correct difference by regrouping from the ten's place to the one's place (In order to fix the mistake, you must use regrouping instead of just reversing the equation . . . student can regroup 1 tens and 2 ones to make 0 tens and 12 ones. Then, the student can do 12 – 9 = 3, then move to the tens place and do 0 – 0 = 0. Finally, you go to the hundreds place and do 4 – 3 = 1. There are 103 more 4^{th} graders than 3^{rd} graders). **Reasoning Component:** • **Student Response:** 309 + 412 = 721. ○ **Rationale for score:** The student provides valid work to find the total number of third and fourth grade students (309 + 412 = 721). **Computation Component:** **Student Response:** 721. ○ **Rationale for score:** A correct total number of third and fourth grade students is provided (721). **Note:** Sample student responses are not representative of all correct answers for an item and are only provided as a guide to assist teachers with scoring.

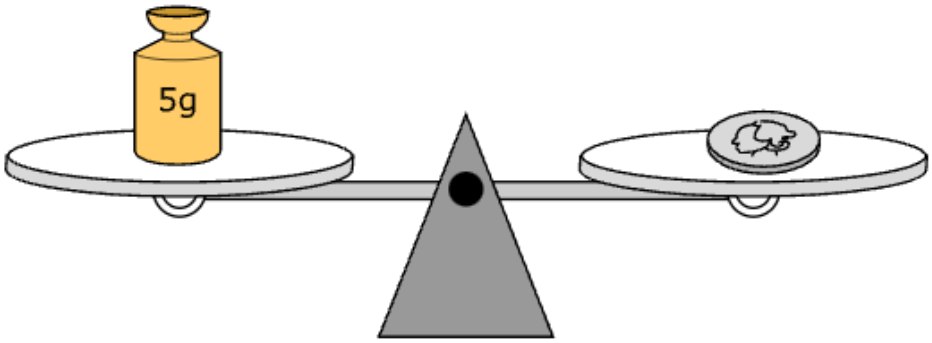
Item Set 1 – Question 9 (Equation Editor)



Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.C.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
Evidence Statement:	3.OA.7-1	Fluently multiply and divide within 25. By end of grade 3, know from memory all products of two one-digit numbers.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.647	

Item Set 1 – Question 10 (Fill in the Blank)

One side of a scale holds grams, and the other side of the scale holds a coin. The scale is balanced.



What is the mass, in grams, of 9 coins?

Enter your answer in the box.

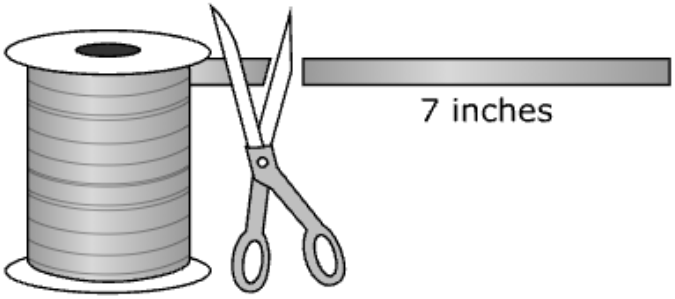
45

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.A.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (This excludes compound units such as cm^3 and finding the geometric volume of a container.) 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.
Evidence Statement:	3.MD.2-2	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.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.614	

Item Set 1 – Question 11 (Constructed Response)

A student is cutting ribbon into strips of equal length.

- The student has a total of 119 inches of ribbon.
- The student cuts the ribbon into 7-inch strips.
- The student has already cut 9 strips of ribbon.



The student wants to know how many more 7-inch strips of ribbon can be cut.

- Explain or show how to find the number of 7-inch strips the student can cut out of the ribbon still left over.
- How many more 7-inch strips can the student cut?

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

Item Information		
Answer:	See Scoring Rubric	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.A.3	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.
Evidence Statement:	3.D.1	Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 3, requiring application of knowledge and skills articulated in Type I, Sub-Claim A Evidence Statements.
Subclaim:	D - Modeling and Application	The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them (MP. 1) ,reasoning abstractly and quantitatively (MP. 2), using appropriate tools strategically (MP.5), looking for and making use of structure (MP.7), and/or looking for and expressing regularity in repeated reasoning (MP.8).
P Value:	0.196	

Scoring Rubric	
Points	**Attributes**
3	Student response includes the following 3 elements. • **Modeling component**: Valid explanation or work to find the inches of ribbon remaining, or the total number of 7-inch strips that can be cut from the total amount of ribbon • **Modeling component**: Valid work or explanation to find the number of 7-inch strips that can be cut from the ribbon left over • **Computation component**: Correct number of 7-inch strips that can be cut from the remaining ribbon, 8
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.
Sample Student Response:	**Sample Solution 1:** 7 x 9 = 63 119 – 63 = 56 56 ÷ 7 = 8
Annotation for Sample Student Response:	**Solution 1, Score Point 3** The response receives full credit. It includes each of the 3 required elements. **Modeling Component:** • **Student Response:** 7 x 9 = 63, 119 – 63 = 56 o **Rationale for Score:** The student provided valid work to find the inches of ribbon remaining by first multiplying the 9 strips already cut by the length of each strip, to find the inches of ribbon already cut (7 x 9 = 63) and subtracting the amount of ribbon already cut from the total inches of ribbon to find the inches of ribbon remaining (119 – 63 = 56). **Modeling Component:** • **Student Response:** 56 ÷ 7 = 8 o **Rationale for score:** The student provided valid work to find the additional number of 7-inch strips that can be cut by dividing the remaining ribbon by 7, the length of each strip (56 ÷ 7 = 8) **Computation Component:** • **Student Response:** 8 o **Rationale for score:** The student provides a correct number of 7-inch strips that can be cut from the remaining ribbon (8). **Note:** Sample student responses are not representative of all correct answers for an item and are only provided as a guide to assist teachers with scoring.

ANSWER KEY: ITEM SET 2

Item Set 2 - Question 1 (TEI Drag and Drop)

Find the missing length, width, or perimeter for each rectangle in the table.

Drag and drop a number into each blank.

7 12 13

	Length (inches)	Width (inches)	Perimeter (inches)
Rectangle A	4	3	14
Rectangle B	2	8	20
Rectangle C	3	5	16

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.D.8	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.
Evidence Statement:	3.MD.8	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.
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.169	

Item Set 2 - Question 2 (TEI Drag and Drop, Constructed Response)

A teacher is making a rectangular reading space for students in a classroom.

Part A

There are three different ways the teacher can make the reading space. The table is missing some of the information needed.

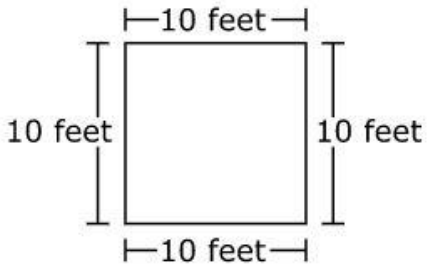
Drag and drop a number into each spot on the table. Each number may be used once, more than once, or not at all.

4 7 8 13 27 42

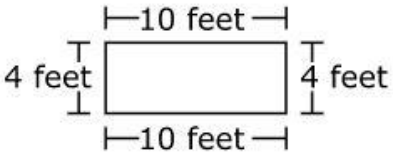
	Length (feet)	Width (feet)	Area (square feet)
Reading Space 1	4	9	36
Reading Space 2	7	6	42
Reading Space 3	8	8	64

Part B

The students make two different drawings of a reading space. The students think each reading space has an area of 40 square feet.



Drawing 1



Drawing 2

- Explain whether each drawing shows an area of 40 square feet.
- Explain a different way the reading space can have an area of 40 square feet.

Enter your explanations in the space provided.

Item Information		
Answer:	See Scoring Rubric and Sample Student Responses	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.C.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.
Evidence Statement:	3.C.3-2	Base explanations/reasoning on concrete referents such as diagrams (whether provided in the prompt or constructed by the student in her response). Content Scope: Knowledge and skills articulated in 3.MD.5, 3.MD.6, 3.MD.7. i) Pool should contain tasks with and without contexts. ii) Tasks with a context may present realistic or quasi-realistic images of a contextual situation (e.g., a drawing of a meadow). However, tasks do not

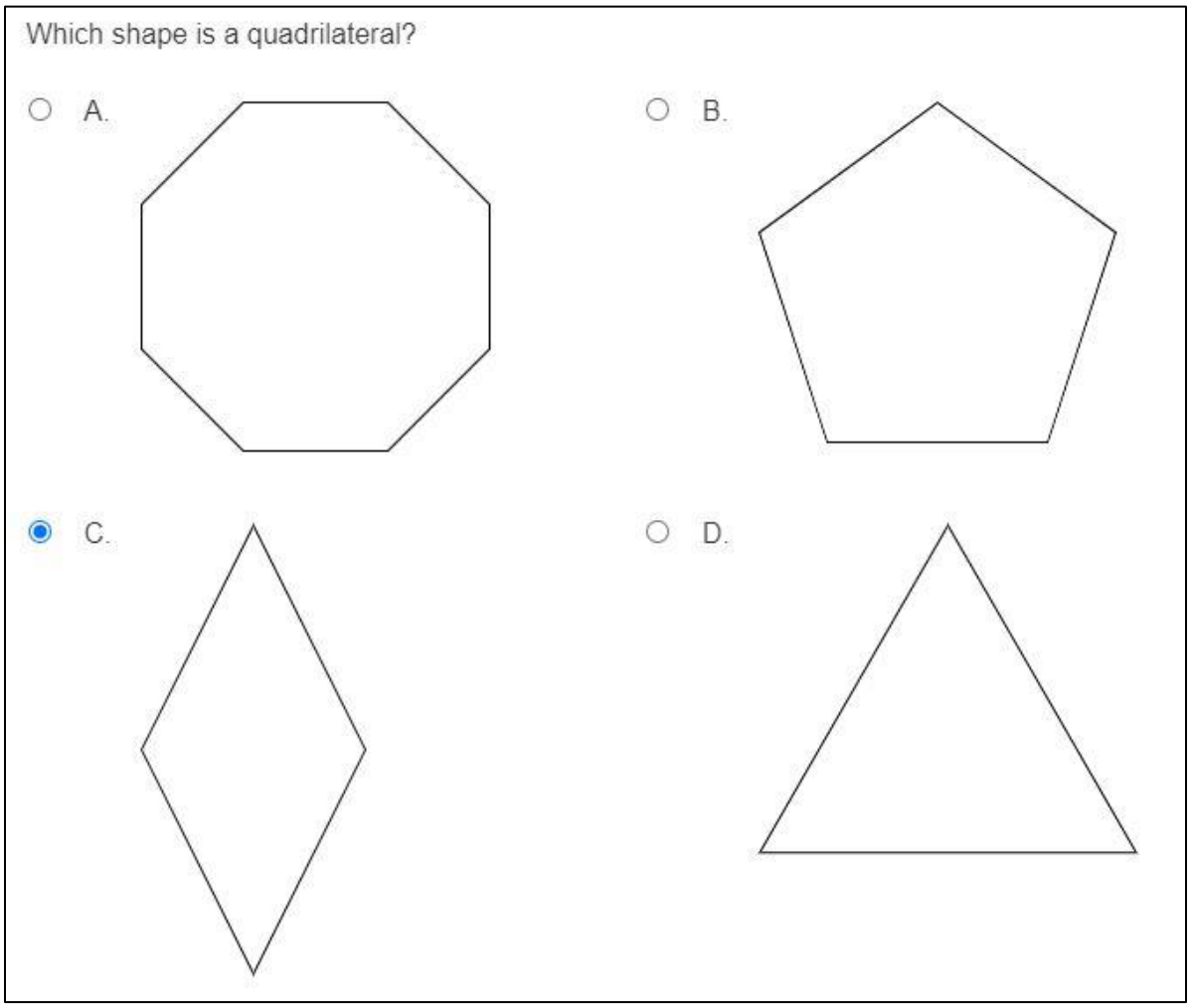
		provide the sort of abstract drawings that help the student to represent the situation mathematically (e.g., a tiling of the meadow).
Subclaim:	C - Expressing Mathematical Reasoning	The student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others, and/or attending to precision when making mathematical statements.
Score Point Distribution:	5.2% of students earned 3 points. 13.8% of students earned 2 points. 29.7% of students earned 1 point. 51.2% of students earned 0 points.	

Scoring Rubric – Part A (Machine Scored)	
Points	**Attributes**
1	**Computation Component:** Student provides the correct values: Reading Space 1: 4 for the length Reading Space 2: 42 for the area Reading Space 3: 8 for the width Note: The three values must be correct to receive credit.
0	Student response is incorrect or irrelevant.

Scoring Rubric – Part B	
Points	**Attributes**
2	Student response includes each of the following 2 elements. • **Reasoning Component**: Valid explanation whether each drawing shows an area of 40 square feet. • **Reasoning Component**: Valid explanation of a different way the reading space can have an area of 40 square feet.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.
Sample Student Response:	Drawing 1 is incorrect when you find the area you multiply the two numbers so the area of drawing one is 100. Number 2 is correct 4 x 10 = 40 so it does have the area of 40. Another way it could have an area of 40 is 5 x 8 = 40 or 2 x 20 = 40 or maybe 1 x 40.

Annotation for Sample Student Response:	**Score Point 2**
	The response receives full credit. It includes each of the two required elements.
	Reasoning Component:
	• **Student Response:** Drawing 1 is incorrect, area of drawing one is 100. Number 2 is correct 4 x 10 = 40.
	  ○ **Rationale for Score:** The student provides a valid explanation of whether each drawing shows an area of 40 square feet by providing that drawing 1 is incorrect because the area is 100 (Drawing 1 is incorrect, area is 100) and that drawing 2 is correct because the area is 40 (Number 2 is correct 4 x 10 = 40).
	Reasoning Component:
	• **Student Response:** Another way it could have an area of 40 is 5 x 8 = 40 or 2 x 20 = 40, or 1 x 40.
	  ○ **Rationale for score:** The student provides a valid explanation of another way the reading space can have an area of 40 square feet (area of 40 is 5 x 8 = 40 or 2 x 20 = 40 or 1 x 40). Note that any one of the three expressions that equal 40 square feet would earn credit for this component.
	
	Note: Sample student responses are not representative of all correct answers for an item and are only provided as a guide to assist teachers with scoring.

Item Set 2 - Question 3 (Selected Response)



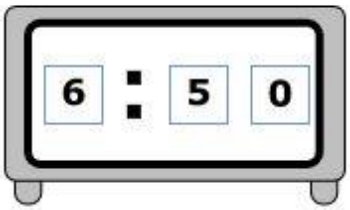
Item Information		
Answer:	C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.G.A.1	Explain that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
Evidence Statement:	3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. i) A trapezoid is defined as "A quadrilateral with at least one pair of parallel sides."
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.673	

Item Set 2 - Question 4 (TEI Drag and Drop)

A student practices the piano for 35 minutes. He starts practice at 6:15.

What time will he end practice?

Drag and drop the numbers into the boxes to show the correct end time on the clock.

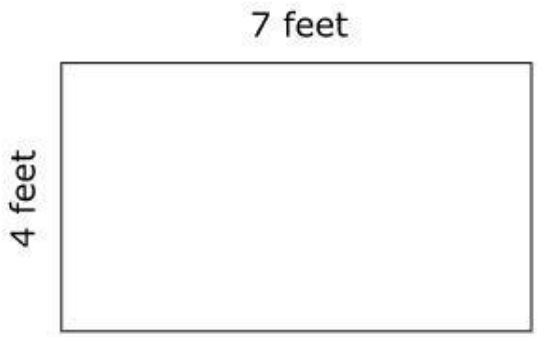


0 1 2 3 4 5 6 7 8 9

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.A.1	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.
Evidence Statement:	3.MD.1-1	Tell and write time to the nearest minute and measure time intervals in minutes. i) Time intervals are limited to 60 minutes. ii) No more than 20% of items require determining a time interval from clock readings having different hour values. Acceptable intervals: ex. Start time 1:20, end time 2:10 – time interval is 50 minutes. Unacceptable intervals: ex. Start time 1:20, end time 2:30 – time interval exceeds 60 minutes.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.47	

Item Set 2 - Question 5 (Fill in the Blank)

The diagram shows a rectangular tabletop.



What is the area, in square feet, of the tabletop?

Enter your answer in the box.

28

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.C.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.
Evidence Statement:	3.MD.7b-1	Relate area to the operations of multiplication and addition. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems. i) Products are limited to the 10 x 10 multiplication table. Notes: This ES is different from 3.OA.3-1 in the following ways: 3.MD.7b-1 emphasizes application/skill while the emphasis of 3.OA.3-1 is on demonstration of understanding of multiplication using not only area but also equal groups and arrays by modeling. 3.MD.7b-1 permits mathematical problems while 3.OA.3-1 is restricted to word problems. 3.MD.7b-1 allows for factors less than or equal to 5 while the factors used in 3.OA.3-1 are restricted to the harder three quadrants.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.567	

Item Set 2 - Question 6 (Selected Response)

What could the expression $27 \div 3$ stand for?

- A. There are 3 cows that leave a group of 27 cows.
- B. There are 3 cows that join a group of 27 cows.
- C. There are 27 groups with 3 cows each.
- D. There are 27 cows in 3 equal groups.

Item Information		
Answer:	D	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.A.2	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when56 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 ÷ 8.
Evidence Statement:	3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 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 ÷ 8. i) Tasks involve interpreting rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. (See 2020 CAS, Appendix: Table 2.) For example, “35 books are placed equally on 7 shelves” can be represented by the expression 35 ÷ 7 rather than “Marcie has 35 books. She placed the same number on each of 7 shelves. How many books did she place on each shelf?” ii) Tasks do not require students to interpret quotients in terms of repeated subtraction, skip-counting, or jumps on the number line. iii) The italicized example refers to describing a context. But describing a context is not the only way to meet the standard. For example, another way to meet the standard would be to identify contexts in which a number of objects can be expressed as a specified quotient. iv) 50% of tasks require interpreting quotients as a number of objects in each share. 50% of tasks require interpreting quotients as a number of equal shares.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.478	

Item Set 2 - Question 7 (Fill in the Blank)

A worker puts together baskets of fruit. He has a total of 63 pieces of fruit. He places 7 pieces of fruit in each basket.

Part A

There are 3 oranges in each basket. How many oranges are there in total?

Enter your answer in the box.

27

Part B

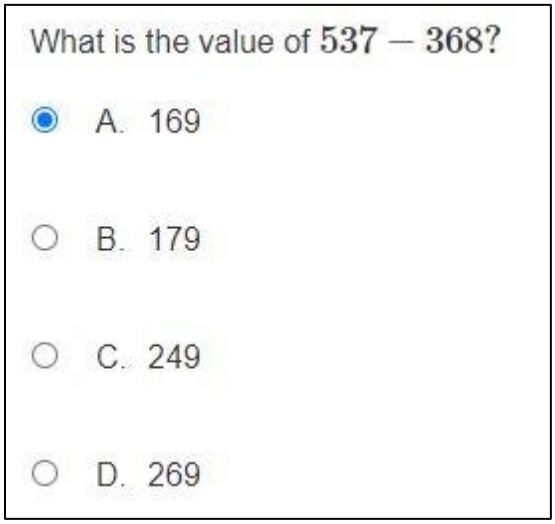
The worker sells 2 baskets of fruit. How many pieces of fruit does the worker have left in the remaining baskets?

Enter your answer in the box.

49

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.D.8	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. (This evidence outcome is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order of operations when there are no parentheses to specify a particular order.)
Evidence Statement:	3.OA.8	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. i) Tasks do not require a student to write a single equation with a letter standing for the unknown quantity in a two-step problem, and then solve that equation. ii) Tasks may require students to write an equation as part of their work to find a solution, but students are not required to use a letter for the unknown. iii) Addition, subtraction, multiplication and division situations in these problems may involve any of the basic situation types with unknowns in various positions (See 2020 CAS, Appendix: Table 1 and Appendix: Table 2.) iv) If scaffolded, one of the 2 parts must require 2-steps. The other part many consist of 1-step. v) Conversions should be part of the 2-steps and should not be a step on its own. vi) If the item is 2 points, the item should be a 2 point, unscaffolded item but the rubric should allow for 2-1-0 points.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.237	

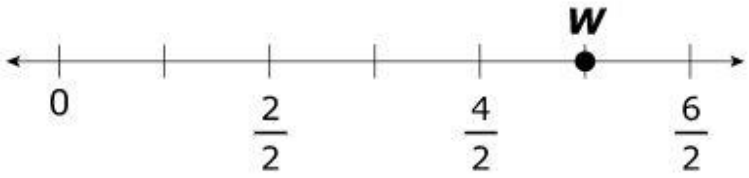
Item Set 2 - Question 8 (Selected Response)



Item Information		
Answer:	A	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.NBT.A.2	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.
Evidence Statement:	3.NBT.2	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. i) Tasks have no context. ii) Tasks are not explicitly timed.
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.481	

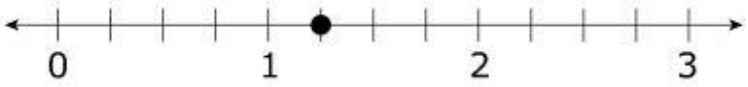
Item Set 2 - Question 9 (Selected Response)

Point W is shown at $\frac{5}{2}$ on the number line.



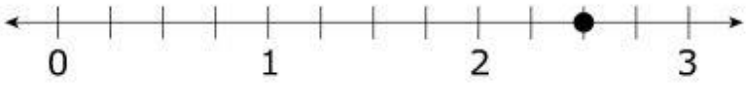
Which number line shows a fraction equivalent to $\frac{5}{2}$?

A.



B.

C.



D.

Item Information		
Answer:	C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.NF.A.3.a	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
Evidence Statement:	3.NF.3a-2	Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same point on a number line. i) Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8. ii) Fractions equivalent to whole numbers are limited to 0 through 5. iii) The explanation aspect of 3.NF.3 is not assessed here.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.392	