

Formative Instructional and Assessment Tasks

Zeke's Dog 3.OA.1 - Task 1

Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.
Materials	Paper, pencils, white boards and dry-erase markers (optional)
Task	<p>Part 1: Zeke's dog eats 3 cups of food a day. If Zeke goes away for 9 days how much food should he leave?</p> <p>Part 2: If Zeke is staying away for 3 days less, how much food should he leave?</p> <p>Part 3: Write a sentence explaining how you know that you are correct.</p>

Rubric

Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Incorrect answer and work are given. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR Uses partially correct work but does not have a correct solution. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Accurately finds the answers (27, 18, $9 \times 3 = 27$, $6 \times 3 = 18$). AND Uses an appropriate model to represent and justify the solution. AND Writes a clear and accurate sentence explaining their strategies.

Standards for Mathematical Practice

1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Zeke's Dog

Draw a picture and write an equation for each part of the task.

Part 1: Zeke's dog eats 3 cups of food a day. If Zeke goes away for 9 days how much food should he leave?

Part 2: If Zeke is staying away for 3 days less, how much food should he leave?

Part 3: Write a sentence explaining how you know that you are correct.

Formative Instructional and Assessment Tasks

Football Game 3.OA.1 - Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.
Materials	Task handout, pencils, white boards and dry-erase markers (optional)
Task	<p>Part 1: Kayla went to a football game. Her team scored 6 times, and got the extra point each time. A touchdown with an extra point is worth 7 points. How many points did her team score?</p> <p>Part 2: If the other team scored 2 more times than her team and got 7 each time, how many points did they have? Write a sentence explaining how you know that you are correct, or show your work in a picture.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR Uses partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answers (42 for 6×7 and 56 for 8×7 OR $6 \times 7 + 2 \times 7 = 56$). AND Uses an appropriate model to represent and justify the solution. AND Writes a clear and accurate sentence explaining their strategies or draws picture demonstrating work.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Football Game

Draw a picture and write an equation to represent each part of the task.

Part 1: Kayla went to a football game. Her team scored 6 times, and got the extra point each time. A touchdown with an extra point is worth 7 points. How many points did her team score?

Part 2: If the other team scored 2 more times than her team and got 7 each time, how many points did they have? Write a sentence explaining how you know that you are correct.

Formative Instructional and Assessment Tasks

Road Trip 3.OA.1 - Task 3	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.
Materials	Task handout, pencils, white boards and dry-erase markers (optional)
Task	<p>Part 1: Cora went on a trip with her parents. She was bored at lunch and counted all the tires in the parking lot. If she counted 36 tires on cars, how many cars were in the parking lot?</p> <p>Part 2: If 3 cars left before she counted, how many cars would have been there? How many tires? Write a sentence explaining your thinking or show your work using pictures or numbers.</p>

Rubric		
Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Incorrect answer and work are given. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct work but does not have a correct solution. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Accurately finds the answers (9 cars, $9 \times 4 = 36$ and 6 cars, $6 \times 6 = 36$). AND Uses an appropriate model to represent and justify the solution. AND Writes a clear and accurate sentence explaining their strategies.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Road Trip

Draw a picture and write an equation for each part of the task.

Part 1: Cora went on a trip with her parents. She was bored at lunch and counted all the tires in the parking lot. If she counted 36 tires on cars, how many cars were in the parking lot?

Part 2: If 3 cars left before she counted, how many cars would have been there? How many tires? Write a sentence explaining your thinking.

Formative Instructional and Assessment Tasks

Ants! 3.OA.1 - Task 4	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.
Materials	Activity sheet, pencils, white boards and dry-erase markers (optional)
Task	<p>Part 1: Nathan’s mom has ants in her house. Ants have 6 legs. How many ants could there have been if she saw between 35 and 50 legs?</p> <p>Part 2: Make a model with manipulatives or by drawing to show how you get each solution. Write a sentence explaining your thinking.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answers (6, 7 or 8 ants). AND Uses an appropriate model to represent and justify the solution. AND Writes a clear and accurate sentence explaining their strategies.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Ants!

Draw a picture and write an equation for each part of the task.

Part 1: Nathan's mom has ants in her house. Ants have 6 legs. How many ants could there have been if she saw between 35 and 50 legs?

Part 2: Make a model with manipulatives or by drawing to show how you get each solution. Write a sentence explaining how you know that your answers are correct.

Formative Instructional and Assessment Tasks

Bike Race 3.OA.2 - Task 1	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.2 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.
Materials	Paper, pencils, white boards and dry-erase markers (optional)
Task	<p>Ember rode in a bike race. Every 6 miles, she stopped for a drink of water at a water station. How many stops has she made after riding:</p> <p>48 miles? 54 miles? 60 miles?</p> <p>Use a picture and write an equation for each part of the task. Write a sentence explaining how you solved the problem.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR Has partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answers (8, 9, 11). AND Accurate division or multiplication equation AND The sentence clearly and accurately states student's strategies.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Bike Race

Use a picture and write an equation for each part of the task. Write a sentence explaining how you solved the problem.

Ember rode in a bike race. Every 6 miles, she stopped for a drink of water at a water station. How many stops has she made after riding 48 miles?

How many stops has she made after riding 54 miles?

How many stops has she made after riding 60 miles?

Formative Instructional and Assessment Tasks

Sherrin's Breakfast Melon 3.OA.2 - Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.2 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.
Materials	Paper, pencils, white boards and dry-erase markers (optional)
Task	<p>Use a picture and write an equation for each part of the task. Write a sentence explaining how you solved the problem.</p> <p>Sherrin cut a melon for her family to eat at breakfast. She cut it into 48 pieces. If there are 8 people who eat breakfast in her family and everyone eats the same amount, how many pieces would each person get?</p> <p>What if 2 people did not come to breakfast, so only 6 people ate? How many pieces would each person get?</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Has partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answers (6, 8). AND Accurate division or multiplication equation AND The sentence clearly and accurately states student's strategies.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Sherrin's Breakfast Melon

Use a picture and write an equation for each part of the task. Write a sentence explaining how you solved the problem.

Sherrin cut a melon for her family to eat at breakfast. She cut it into 48 pieces. If there are 8 people who eat breakfast in her family and everyone eats the same amount, how many pieces would each person get?

What if 2 people did not come to breakfast, so only 6 people ate? How many pieces would each person get?

Formative Instructional and Assessment Tasks

Ray's Hamster Run 3.OA.2 - Task 3	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.2 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.
Materials	Paper, pencils, counters, white boards and dry-erase markers (optional)
Task	<p>Use a picture to model your array and write an equation for each task. Write a sentence explaining how you solved the problem.</p> <p>Ray wants to make a run for his hamster. He can get tubes in 6 inch lengths or 4 inch lengths to build a hamster run.</p> <p>Which size should he buy if he wants the hamster run to be 54 inches? How many pieces would he need to buy? Use the counters to make an array that shows your answer.</p> <p>Which size should he buy if he wants the hamster run to be 32 inches? How many pieces would he need to buy? Use the counters to make an array that shows your answer.</p> <p>If he wanted to use 6 inch tubes to make a hamster run bigger than 32 inches and smaller than 54 inches, what sizes could it be? Make an array to show this hamster run.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Has partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answers (9, 8 and for part 3- 36, 42 or 48). AND Accurate division or multiplication equation AND The sentence clearly and accurately states student's strategies.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Ray's Hamster Run

Use a picture to model your array and write an equation for each task. Write a sentence explaining how you solved the problem.

Ray wants to make a run for his hamster. He can get tubes in 6 inch lengths or 4 inch lengths to build a hamster run.

Which size should he buy if he wants the hamster run to be 54 inches? How many pieces would he need to buy? Use the counters to make an array that shows your answer.

Which size should he buy if he wants the hamster run to be 32 inches? How many pieces would he need to buy? Use the counters to make an array that shows your answer.

If he wanted to use 6 inch tubes to make a hamster run bigger than 32 inches and smaller than 54 inches, what sizes could it be? Make an array to show this hamster run.

Formative Instructional and Assessment Tasks

Ladybugs 3.OA.3 - Task 1	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.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.
Materials	Paper, pencils, Counters Optional: White boards and dry-erase markers
Task	Ladybugs have 6 legs. You see a group of ladybugs on the ground. If you see 48 legs, how many ladybugs are there? How many eyes would you see? If ladybugs have 4 wings, how many wings would you see? Draw a picture and write an equation for each part of the task. Write a sentence explaining how you found your answers.

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Struggles to set up and use a logical strategy for exploring this task. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there is an incorrect model, equation, or sentence. Work is logically shown, but there is a calculation or mathematical error 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answers (8 ladybugs, 16 eyes, 32 wings). AND An appropriate picture and correct equation for each part of the task AND The sentence clearly and accurately describes student's strategies.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Ladybugs

Draw a picture and write an equation for each part of the task. Write a sentence explaining how you found your answers.

Ladybugs have 6 legs. You see a group of ladybugs on the ground.

If you see 48 legs, how many ladybugs are there?

How many eyes would you see?

If ladybugs have 4 wings, how many wings would you see?

Formative Instructional and Assessment Tasks

Counting Goldfish 3.OA.3 Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.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.
Materials	Paper, pencils, counters or square tiles Optional: White boards and dry-erase markers
Task	<p>5 teachers have fish tanks in their classroom. Each teacher receives an equal number of tropical fish to put in his/her fish tank. Each teacher also receives 6 goldfish.</p> <p>If there are between 34 and 56 fish in the school, how many tropical fish could there be? Use your counters or square tiles to model the problem. Find at least 3 possible answers and write an equation for each solution.</p> <p>Write a sentence to explain how you solved the task.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR Uses partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answers: There could be as few as 1 or as many as 5 tropical fish. AND Clearly and accurately describes the task.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Counting Goldfish

Use your counters or square tiles to model the problem. Find at least 3 possible answers and write an equation for each solution. Write a sentence to explain how you solved the task.

5 teachers have fish tanks in their classroom. Each teacher receives an equal number of tropical fish to put in his/her fish tank. Each teacher also receives 6 goldfish.

If there are between 34 and 56 fish in the school, how many tropical fish could there be?

Formative Instructional and Assessment Tasks

Raking Leaves 3.OA.3 Task 3

Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.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.
Materials	Activity sheet, pencils, counters or square tiles Optional: White boards and dry-erase markers
Task	<p>Libby is earning some spending money by raking leaves for her grandma. She gets paid \$7 a bag for each trash bag that she fills with leaves.</p> <ol style="list-style-type: none"> Use counters or square tiles to model how many bags she would need to fill if she wanted to earn more than \$30. What is the smallest number of bags she would need to fill? Find at least 3 ways she could make more than \$30 by raking leaves. If her grandma has 8 trash bags, what is the most money she could make? Draw an array to model your work and write a number sentence to explain how you solved each of the tasks.

Rubric

Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Incorrect answer and work are given. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct work but does not have a correct solution. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Accurately finds the answers: There could be 5 or more bags, and she would have to fill at least 5 bags, she could make \$35, \$42, \$49 and \$56 is the most that she could make. <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Clearly and accurately describes the task.

Standards for Mathematical Practice

1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Raking Leaves

Libby is earning some spending money by raking leaves for her grandma. She gets paid \$7 a bag for each trash bag that she fills with leaves.

1. Use counters or square tiles to model how many bags she would need to fill if she wanted to earn more than \$30. What is the smallest number of bags she would need to fill? Draw an array to model your work with counters here. Write a number sentence to explain this model.

2. Find at least 3 ways she could make more than \$30 by raking leaves. Draw an array to model your work with counters here. Write a number sentence to explain this model.

3. If her grandma has 8 trash bags, what is the most money she could make? Draw an array to model your work with counters here. Write a number sentence to explain this model.

Formative Instructional and Assessment Tasks

Chairs for a Party 3.OA.4-Task 1	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
Materials	Activity sheet, Paper, pencils Optional: White boards and dry-erase markers
Task	<p>Part One: There are 24 chairs that need to be arranged for a party. What are the various ways that you can arrange the chairs into equal groups? You want to have between 3 and 13 chairs in each group. Draw pictures of the various groups of chairs and then write an equation for each solution.</p> <p>Part Two: What if you had 40 chairs to arrange in groups? You want to have between 3 and 12 chairs in each group.</p> <p>Part Three: Write a sentence explaining how you solved this task.</p>

Rubric		
Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Student struggles to find different ways to arrange chairs. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Student accurately finds all of the answers, but has errors in their pictures, equations, or sentence Student logically shows work but makes a mathematical error. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Student accurately finds the various ways to arrange 24 chairs and 40 chairs within the constraints of the task: 24 chairs: 2 groups of 12, 3 groups of 8, 4 groups of 6, 6 groups of 4, 8 groups of 3. 40 chairs: 4 groups of 10, 5 groups of 8, 8 groups of 5, 10 groups of 4. AND Uses correct pictures and equations. AND The sentence clearly and accurately demonstrates the student's strategy.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Chairs for a Party

Part One:

There are 24 chairs that need to be arranged for a party. What are the various ways that you can arrange the chairs into equal groups? You want to have between 3 and 13 chairs in each group.

Draw pictures of the various groups of chairs and then write an equation for each solution.

Part Two:

What if you had 40 chairs to arrange in groups? You want to have between 3 and 12 chairs in each group.

Part Three:

Write a sentence explaining how you solved this task.

Formative Instructional and Assessment Tasks

Glue for the Tables 3.OA.4 Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
Materials	1-inch square tiles, Paper, Pencil
Task	<p>The art teacher has 40 bottles of glue. She needs to give same number of bottles to each table of students. There are less than 11 tables and more than 3 tables. How many tables will she need to seat students at so that she can share the glue equally?</p> <p>Use your manipulatives to model the task. For every solution, write a division equation.</p> <p>What would happen if she had 7 tables? Could she distribute them evenly?</p> <p>Write a sentence explaining how you used manipulatives to solve this task.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR Uses partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Solutions: 40 bottles of glue can be equally shared at 4 tables, 5 tables, 8 tables, 10 tables. 7 tables cannot be distributed evenly. AND The sentence clearly and appropriately states how manipulatives were used.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Glue for the Tables

The art teacher has 40 bottles of glue. She needs to give same number of bottles to each table of students. There are less than 11 tables and more than 3 tables. How many tables will she need to seat students at so that she can share the glue equally?

Use your manipulatives to model the task. For every solution, write a division equation.

What would happen if she had 7 tables? Could she distribute them evenly?

Write a sentence explaining how you used manipulatives to solve this task.

Formative Instructional and Assessment Tasks

Making Cards 3.OA.4 Task 3

Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
Materials	1-inch square tiles, Paper, Pencil
Task	<p>A group of students want to make cards for 30 teachers in their school.</p> <ol style="list-style-type: none"> If they want to make the same number of cards each, how many cards would 5 students make? To distribute the cards evenly, what other number of students could make cards? Could 4 students make distribute 30 cards evenly? Explain your answer with words or models. Use your manipulatives to model the task. For every solution, write a division equation and draw a picture of your models. Write a sentence explaining how you used manipulatives to solve this task.

Rubric

Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Incorrect answer and work are given. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct work but does not have a correct solution. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Solutions: 30 cards could be 5 groups of 6, 6 groups of 5, 3 groups of 10 or 10 groups of 3. 4 tables cannot be distributed evenly from 30. <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> The sentence clearly and appropriately states how manipulatives were used.

Standards for Mathematical Practice

1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Crackers for All 3.OA.4 - Task 4

Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
Materials	Task handout, Paper, pencils, manipulative counters or square tiles Optional: White boards and dry-erase markers
Task	<p>Part One: Cheese crackers come in packs of 4 or 6. If you need to feed 12 people with one size or the other (1 cracker per person), what are the ways that you can buy them? Use your manipulatives to model the problem and find solutions. Draw pictures of the various packs of crackers and then write an equation for each solution.</p> <p>Part Two: What if you wanted to give them 2 crackers each? Draw the packs of crackers and write an equation for each solution you can find.</p> <p>Part Three: What if you wanted to give them 3 crackers each? Draw the packs of crackers and write an equation for each solution you can find. Write a sentence explaining how you solved this task.</p>

Rubric

Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Student struggles to find different ways to arrange chairs. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Student accurately finds all of the answers, but has errors in their pictures, equations, or sentence Student logically shows work but makes a mathematical error. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Student accurately finds the various ways to arrange 1 cracker per person (12 crackers): 3 packs of 4 and 2 packs of 6; <u>2 crackers</u> per person (24): 4 packs of 6 and 6 packs of 4; <u>3 crackers</u> per person (36 total) 6 packs of 6 and 9 packs AND Uses correct pictures and equations. AND The sentence clearly and accurately demonstrates the student's strategy.

Standards for Mathematical Practice

1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Packs of Crackers

Part One:

Cheese crackers come in packs of 4 or 6. If you need to feed 12 people with one size or the other (1 cracker per person), what are the ways that you can buy them? Use your manipulatives to model the problem and find solutions. Draw pictures of the various packs of crackers and then write an equation for each solution.

Part Two:

What if you wanted to give them 2 crackers each? Draw the packs of crackers and write an equation for each solution you can find.

Part Three:

What if you wanted to give them 3 crackers each? Draw the packs of crackers and write an equation for each solution you can find. Write a sentence explaining how you solved this task.

Formative Instructional and Assessment Tasks

Patterns on the Multiplication Chart 3.OA.5-Task 1	
Domain	Operations and Algebraic Thinking
Cluster	Understand properties of multiplication and the relationship between multiplication and division.
Standard(s)	<p>3.OA.5 Apply properties of operations as strategies to multiply and divide.2 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 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</p> <p>Additional Standard: Solve problems involving the four operations, and identify and explain patterns in arithmetic.</p> <p>3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>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.</i></p>
Materials	multiplication chart (following page), paper, pencils, manipulatives, white boards and dry-erase markers (optional)
Task	<ul style="list-style-type: none"> • Give each student a copy of the shaded multiplication chart (see attached). • Briefly prompt students to look at the two shaded boxes containing 6's (which are separated by the diagonal dotted line). • Ask students to independently think about each question: <ul style="list-style-type: none"> ○ What observations can you make about these two products? • Have students analyze the remaining pairs of shaded boxes on the multiplication chart. • Prompt students to respond in writing to the following questions: <ul style="list-style-type: none"> ○ What equations can be used to represent each set of shaded numbers? ○ Why can more than one equation be used to represent each product?

Rubric		
Level I	Level II	Level III
<ul style="list-style-type: none"> • Student uses inappropriate solution strategy and does not achieve the correct answer. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> • Student finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR • Uses partially correct strategy, but gets the wrong answer. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> • Student notice that each set of numbers has the same factors. Student records correct equations to represent each set of numbers. • Student correctly explains that factors can be reversed in an equation, while maintaining the same product (commutative property).

*Level IV: student uses multiple models to support their reasoning (i.e., equations, arrays, etc.). Student also notices additional patterns.

Formative Instructional and Assessment Tasks

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Adapted from *illustrativemathematics.org*

Formative Instructional and Assessment Tasks Patterns on the Multiplication Chart

x	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Formative Instructional and Assessment Tasks

Prove it! 3.OA.5 - Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.5 Apply properties of operations as strategies to multiply and divide.
Materials	Activity sheet, pencils, white boards and dry-erase markers (optional)
Task	<p>Use your tiles to build a 7x6 array. Decompose the array into two smaller rectangles.</p> <p>Decompose the 7x6 array into two smaller rectangles in two MORE different ways.</p> <p>For each way that you decomposed the array, write an equation that matches your strategy.</p> <p>Work with a partner to evaluate each other's arrays. Critique their strategy and their reasoning.</p> <p>Write a sentence comparing one of your strategies and your partner's strategies for decomposing arrays.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR Uses partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds three ways to decompose the 7x6 array. Clearly and accurately compares their and their partner's strategies.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Prove It!

1. Use your tiles to build a 7×6 array.
2. Decompose the array into two smaller rectangles.
3. Decompose the 7×6 array into two smaller rectangles in two MORE different ways.
4. For each way that you decomposed the array, write an equation that matches your strategy.
5. Work with a partner to evaluate each other's arrays. Critique their strategy and their reasoning.
6. Write a sentence comparing one of your strategies and your partner's strategies for decomposing arrays.

Formative Instructional and Assessment Tasks

Sharing Pencils 3.OA.6 - Task 1

Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.6 Understand division as an unknown-factor problem. <i>For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</i>
Materials	PAPER, pencils, white boards and dry-erase markers (optional)
Task	<ol style="list-style-type: none"> Riley has 64 pencils to give to her friends. If she has 8 friends that she wants to give the pencils to, how could you use multiplication to find out how many pencils each person will get? Use an array or other model to prove that the multiplication fact will help you find the answer. Write related facts (fact family) to show the number sentences you used.

Rubric

Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct work, but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Finds the multiplication fact $8 \times 8 = 64$. Explains that 8 8s make 64 in words or pictures. Includes the fact family: $8 \times 8 = 64$, $64 \div 8 = 8$

Standards for Mathematical Practice

1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Sharing Pencils

Riley has 64 pencils to give to her friends. If she has 8 friends that she wants to give the pencils to, how could you use multiplication to find out how many pencils each person will get?

Use an array or other model to prove that the multiplication fact will help you find the answer.

Write related facts (fact family) to show the number sentences you used.

Formative Instructional and Assessment Tasks

Fair Tickets 3.OA.6 - Task 2

Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.6 Understand division as an unknown-factor problem. <i>For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</i>
Materials	Activity sheet, pencils, manipulatives, white boards and dry-erase markers (optional)
Task	<ol style="list-style-type: none"> Darien is going to the fair. His parents bought him 42 tickets. Each ride is 7 tickets. How many rides can he ride with his tickets? Use your manipulatives, an array or other model to make a multiplication fact will help you find the answer. Write related facts (fact family) to show all the number sentences you can use to solve or check this problem. Explain how multiplication can help you solve this problem.

Rubric

Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct work, but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Finds the multiplication fact $6 \times 7 = 42$. Explains that 6 7s make 42 in words or pictures. Includes the fact family: $6 \times 7 = 42$ $7 \times 6 = 42$ $42 \div 7 = 6$ $42 \div 6 = 7$ Explains connection between multiplication and division

Standards for Mathematical Practice

1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Fair Tickets

Darien is going to the fair. His parents bought him 42 tickets. Each ride is 7 tickets. How many rides can he ride with his tickets?

Use your manipulatives, an array or other model to make a multiplication fact that will help you find the answer.

Write related facts (fact family) to show all the number sentences you can use to solve or check this problem. Explain how multiplication can help you solve this problem.

Formative Instructional and Assessment Tasks

Field Trip 3.OA.7 - Task 1	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.7 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.
Materials	Paper, pencils, square tiles or other counters, activity sheet or grid paper, or one inch grid white boards and dry-erase markers (optional)
Task	<ol style="list-style-type: none"> CC Elementary has 40 third graders. They are taking a field trip to a museum and want to have students in even groups during the tour. What groups could they make? Use your tiles or grid paper to show a model of how they could make the groups. Draw a picture of your solutions. For each solution, write an equation. Write a sentence to explain how you solved the problem.

Rubric		
Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Incorrect answer and work are given. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct work but does not have a correct solution. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Accurately finds the answer (5 groups of 8, 8 groups of 5, 4 groups of 10, 10 groups of 4). Uses an appropriate model to represent and justify the solution. <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Writes a clear and appropriate sentence about their strategy.

- Level IV- Finds 2 groups of 20.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Field Trip

CC Elementary has 40 third graders. They are taking a field trip to a museum and want to have students in even groups during the tour. What groups could they make? Use your tiles or grid paper to show a model of how they could make the garden. Draw a picture of your solutions. For each solution, write an equation.

Write a sentence to explain how you solved the problem.

Formative Instructional and Assessment Tasks

Planting Tomatoes 3.OA.7 - Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Represent and solve problems involving multiplication and division.
Standard(s)	3.OA.7 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.
Materials	Paper, pencils, squares or other counters, activity sheet or one inch grid white boards and dry-erase markers (optional)
Task	Mr. Nala's class is making a garden. They bought 42 tomato plants. They want them in rows that have the same number of plants. There needs to be between 2 and 22 plants in each row. Use your tiles to show a model of how they could make the garden. For each solution, write an equation. Write a sentence to explain how you solved the problem.

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Incorrect answer and work are given. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution OR Uses partially correct work but does not have a correct solution. 	Proficient in Performance <ul style="list-style-type: none"> Accurately finds the answer (2 rows of 21, 3 rows of 14, 6 rows of 7, 7 rows of 6, 14 rows of 3, 21 rows of 2). Uses an appropriate model to represent and justify the solution. AND Writes a clear and appropriate sentence about their strategy.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Planting Tomatoes

Mr. Nala's class is making a garden. They bought 42 tomato plants. They want them in rows that have the same number of plants. There needs to be between 2 and 22 plants in each row.

Use your tiles to show a model of how they could make the garden. For each solution, write an equation.

Write a sentence to explain how you solved the problem.

Formative Instructional and Assessment Tasks

Earning Money 3.OA.8-Task 1	
Domain	Operations and Algebraic Thinking
Cluster	Solve problems involving the four operations, and identify and explain patterns in arithmetic.
Standard(s)	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.
Materials	paper, pencils, calculators, white boards and dry-erase markers (optional)
Task	<p>Ms. Jones’s class is trying to earn \$130 to provide food for the rescue animals at the local shelter. They already earned \$90 at a penny drive. The class has two ways they could raise the rest of the money. They could sweep the lunch room for \$10 per week or pick up trash in the school yard for \$8 per school day. Which job should the class do to earn the money the fastest?</p> <p>Explain your solution using pictures, numbers, or words. Also, write an equation for how you started the problem. Be sure to include the number of weeks required for each job.</p>

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Student is unable to accurately set up this problem 	Not Yet Proficient <ul style="list-style-type: none"> Student finds the correct answer, but there may be inaccuracies or incomplete justification of solution. 	Proficient in Performance <ul style="list-style-type: none"> Student accurately solves problem. Student uses an appropriate model to represent and justify the solution.

**Level IV would be to include generating two equations to represent the two different options for earning money.*

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Earning Money

Ms. Jones's class is trying to earn \$130 to provide food for the rescue animals at the local shelter. They already earned \$90 at a penny drive. The class has two ways they could raise the rest of the money. They could sweep the lunch room for \$10 per week or pick up trash in the school yard for \$8 per school day. Which job should the class do to earn the money the fastest?

Explain your solution using pictures, numbers, or words. Also, write an equation for how you started the problem. Be sure to include the number of weeks required for each job.

Formative Instructional and Assessment Tasks

Packs of Juice Boxes 3.OA.8 and 3.OA.9 - Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Solve problems involving the four operations, and identify and explain patterns in arithmetic.
Standard(s)	<p>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.</p> <p>3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>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.</i></p>
Materials	Paper, pencils, calculators, manipulatives, white board and dry-erase markers (optional)
Task	<ul style="list-style-type: none"> Each of the 20 students in Mr. Morgan’s class sent in a pack of juice boxes for the third grade party. Some packs came with six juice boxes and some came with four juice boxes. If there was a total of 104 juice boxes, how many four-packs and how many six-packs of juice boxes were there? Use pictures, words, or numbers to show your solution.

Rubric		
Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Student uses inappropriate solution strategy and does not get the correct answer. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution <i>OR</i> Uses partially correct strategy, but gets the wrong answer. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Accurately solves problem (12 six-packs and 8 four-packs) Use appropriate pictures, words, or numbers to justify the solution.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Packs of Juice Boxes

Each of the 20 students in Mr. Morgan's class sent in a pack of juice boxes for the third grade party. Some packs came with six juice boxes and some came with four juice boxes. If there was a total of 104 juice boxes, how many four-packs and how many six-packs of juice boxes were there?

Use pictures, words, or numbers to show your solution.

Formative Instructional and Assessment Tasks

Trip to Amusement Park 3.OA.8- Task 3	
Domain	Operations and Algebraic Thinking
Cluster	Solve problems involving the four operations, and identify and explain patterns in arithmetic.
Standard(s)	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.
Materials	Paper, pencils, calculators, manipulatives, white board and dry-erase markers (optional)
Task	<p>Cora and her family are going to an amusement park. There are 2 adults and 3 children. The tickets cost her family \$70. Adults are twice as much as children. If they are at the park for 5 hours, how much did their trip cost per person, per hour?</p> <ul style="list-style-type: none"> How much is an adult ticket? How much is a child's ticket? Use words, pictures or numbers to show how you find your answer here: How much did it cost for an adult, per hour? How much did it cost for a child, per hour? Use words, pictures or numbers to show how you find your answer here: How can you know if your answer makes sense? Show a way you can decide if your answer is correct here:

Rubric		
Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Student uses inappropriate solution strategy and does not get the correct answer. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> Uses partially correct strategy, but gets the wrong answer. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Accurately solves problem (\$10 for children, \$20 for adults, \$2 per hour for children, \$4 for adults) Use appropriate pictures, words, or numbers to justify the solution.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Trip to Amusement Park

Cora and her family are going to an amusement park. There are 2 adults and 3 children. The tickets cost her family \$70. Adults are twice as much as children. If they are at the park for 5 hours, how much did their trip to the amusement park cost per person, per hour?

How much is an adult ticket? How much is a child's ticket?

Use words, pictures or numbers to show how you find your answer here:

How much did it cost for an adult, per hour? How much did it cost for a child, per hour? Use words, pictures or numbers to show how you find your answer here:

How can you know if your answer makes sense?

Show a way you can decide if your answer is correct here:

Formative Instructional and Assessment Tasks

Soccer Uniform 3.OA.8 - Task 4	
Domain	Operations and Algebraic Thinking
Cluster	Solve problems involving the four operations, and identify and explain patterns in arithmetic.
Standard(s)	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.
Materials	Paper, pencils, calculators, manipulatives, white board and dry-erase markers (optional)
Task	Jackson needs \$40 to get a new uniform for soccer. He has \$8 already. His mother said she will pay him \$4 a week to rake the yard. How many weeks will he have to rake the yard to have enough money for his new uniform? Show how you solved this problem, using pictures, words, or numbers.

Rubric		
Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Student uses inappropriate solution strategy and does not get the correct answer. 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> Uses partially correct strategy, but gets the wrong answer. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Accurately solves problem (8 weeks). Uses appropriate pictures, words, or numbers to justify the solution.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Soccer Uniform

Jackson needs \$40 to get a new uniform for soccer. He has \$8 already. His mother said she will pay him \$4 a week to rake the yard. How many weeks will he have to rake the yard to have enough money for his new uniform?

Show how you solved this problem, using pictures, words, or numbers.

Formative Instructional and Assessment Tasks

Patterns in a Table 3.OA.9 - Task 1																																																		
Domain	Operations and Algebraic Thinking																																																	
Cluster	Solve problems involving the four operations, and identify and explain patterns in arithmetic.																																																	
Standard(s)	3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>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.</i>																																																	
Materials	Task handout, pencils, or crayon																																																	
Task	<p>The table shows products of the whole numbers 1 through 6</p> <table border="1" data-bbox="743 625 1117 991"> <tbody> <tr> <td>×</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>1</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>2</td> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>10</td> <td>12</td> </tr> <tr> <td>3</td> <td>3</td> <td>6</td> <td>9</td> <td>12</td> <td>15</td> <td>18</td> </tr> <tr> <td>4</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>20</td> <td>24</td> </tr> <tr> <td>5</td> <td>5</td> <td>10</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> </tr> <tr> <td>6</td> <td>6</td> <td>12</td> <td>18</td> <td>24</td> <td>30</td> <td>36</td> </tr> </tbody> </table> <p>Part 1:</p> <ol style="list-style-type: none"> Color all of the even products in the table. What do you notice about the even and odd numbers in the table? (Sometimes there are even numbers next to each other in the table. However, there are never odd numbers next to each other.) Why is this true? <p>Part 2:</p> <p>If you extend the table to 9, would this still be true?</p> <p>The goal is to look for structure and identify patterns and then try to find the mathematical explanation for this. This problem examines the "checkerboard" pattern of even and odd numbers in a single digit multiplication table. The even numbers in the table are examined in depth using a grade appropriate notion of even, namely the possibility of reaching the number counting by 2 or expressing the number as a whole number of pairs.</p>	×	1	2	3	4	5	6	1	1	2	3	4	5	6	2	2	4	6	8	10	12	3	3	6	9	12	15	18	4	4	8	12	16	20	24	5	5	10	15	20	25	30	6	6	12	18	24	30	36
×	1	2	3	4	5	6																																												
1	1	2	3	4	5	6																																												
2	2	4	6	8	10	12																																												
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4	4	8	12	16	20	24																																												
5	5	10	15	20	25	30																																												
6	6	12	18	24	30	36																																												

Formative Instructional and Assessment Tasks

×	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36

We know that even numbered rows and even numbered columns contain only even numbers. We also know that every other column/row is even numbered because the even numbers are found counting by 2's which skips one whole number each time. Adjacent columns cannot contain odd numbers because one of the columns is an even column (which contains only even numbers) and one is an odd column. For the same reason, adjacent rows cannot contain odd numbers.

The reasoning in part 2 applies no matter how far the multiplication table is extended. This is the case because the reasoning depends only on whether the numbers considered are even or odd. The 9 by 9 table is pictured below:

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Adapted from <http://www.illustrativemathematics.org/standards/hs>

Rubric		
Level I	Level II	Level III
<p>Limited Performance</p> <ul style="list-style-type: none"> Student does not find the pattern nor can they explain the pattern 	<p>Not Yet Proficient</p> <ul style="list-style-type: none"> Student finds the pattern in the table, but there may be inaccuracies or incomplete justification of pattern. <p><i>OR</i></p> <ul style="list-style-type: none"> Students explains the patterns put the coloring of the pattern on the table is incorrect. 	<p>Proficient in Performance</p> <ul style="list-style-type: none"> Student finds the pattern on the table. Accurately explains the pattern. Extends the pattern to 9 in the table and justifies the structure of the pattern extension.

Formative Instructional and Assessment Tasks

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Patterns in a Table

The table shows products of the whole numbers 1 through 6

x	1	2	3	4	5	6			
1	1	2	3	4	5	6			
2	2	4	6	8	10	12			
3	3	6	9	12	15	18			
4	4	8	12	16	20	24			
5	5	10	15	20	25	30			
6	6	12	18	24	30	36			

Part 1:

1. Color all of the even products in the table.
2. What do you notice about the even and odd numbers in the table

3. Why is this true?

Part 2:

If you extend the table to 9, would this still be true?

Formative Instructional and Assessment Tasks

Packs of Juice Boxes 3.OA.9 - Task 2	
Domain	Operations and Algebraic Thinking
Cluster	Solve problems involving the four operations, and identify and explain patterns in arithmetic.
Standard(s)	3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>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.</i>
Materials	Paper, pencils, calculators, manipulatives, white board and dry-erase markers (optional)
Task	Each of the 20 students in Mr. Morgan’s class sent in a pack of juice boxes for the third grade party. Some packs came with six juice boxes and some came with four juice boxes. If there was a total of 104 juice boxes, how many four-packs and how many six-packs of juice boxes were there? Use pictures, words, or numbers to show your solution.

Rubric		
Level I	Level II	Level III
Limited Performance <ul style="list-style-type: none"> Student uses inappropriate solution strategy and does not get the correct answer. 	Not Yet Proficient <ul style="list-style-type: none"> Finds the correct answer, but there may be inaccuracies or incomplete justification of solution. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Uses partially correct strategy, but gets the wrong answer. 	Proficient in Performance <ul style="list-style-type: none"> Accurately solves problem (12 six-packs and 8 four-packs) Use appropriate pictures, words, or numbers to justify the solution.

Standards for Mathematical Practice
1. Makes sense and perseveres in solving problems.
2. Reasons abstractly and quantitatively.
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. Attends to precision.
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning.

Formative Instructional and Assessment Tasks

Packs of Juice Boxes

Each of the 20 students in Mr. Morgan's class sent in a pack of juice boxes for the third grade party. Some packs came with six juice boxes and some came with four juice boxes. If there was a total of 104 juice boxes, how many four-packs and how many six-packs of juice boxes were there?

Use pictures, words, or numbers to show your solution.