5th Grade F.A.S.T. Fluency Name: _____
Algebraic Reasoning – Worksheet 1

Multi-step real-world problems with 4 operations	**MA.5.AR.1.1**

On Sunday, a bookstore received 18 boxes of new books. Each box contained 38 books. On Monday, the bookstore sold 71 of the new books. How many of the new books remain to be sold?	Jennifer has 132 trading cards. Carlos has 28 fewer trading cards than Jennifer. Maggie has twice as many trading cards as Carlos. How many trading cards do all three students have combined?	There are 117 girls and 128 boys in the fifth-grade class. The entire 5th grade class is going on a field trip, using buses for transportation. If each bus holds 36 students, how many buses will they need for the field trip?

Real-world problems involving the addition, subtraction or multiplication of fractions	**MA.5.AR.1.2**

Ericka is baking a cake. There are $5\frac{1}{4}$ cups of flour left in the bag, and she needs $2\frac{2}{3}$ cups of flour for the recipe. How much flour will be left in the bag after Ericka makes the cake?	Marcus wants to make banana bread. The recipe calls for $1\frac{3}{4}$ cups of sugar for each loaf. Marcus is going to make 5 loaves of bread. How many cups of sugar will Marcus need?
Yerica has $4\frac{1}{4}$ cups of berries. She uses $\frac{7}{8}$ cup of berries to make a smoothie. She then uses $1\frac{1}{2}$ cups for a fruit salad. After she makes her smoothie and fruit salad, how much of the berries will Yerica have left?	Jason and Juan each had a birthday party on Saturday. Jason has $3\frac{2}{3}$ pizzas left over from the party. Juan has $1\frac{1}{2}$ times as many leftover pizzas as Jason. How many leftover pizzas does Juan have?

Division of a unit fraction by a whole number and a whole number by a unit fraction	**MA.5.AR.1.3**

Adrianna has ½-gallon of mint chocolate chip ice cream. She wants to share her ice cream with 4 friends, but is not having any for herself. How much ice cream will each friend get?	Stephanie has $\frac{1}{3}$-pound of candy that she wants to share equally between herself and two friends. What fraction of a pound of candy will each friend receive?	Clara has ½ of a pizza left over from lunch. She wants to split it up between four of her friends. What fraction of a whole pizza will each friend receive? A. one-half B. one-fourth C. one-sixth D. one-eighth
Jerrod has 6-pounds of candy he will use to fill treat bags for Halloween. Each bag holds $\frac{1}{8}$-pound of candy. How many bags will Jerrod be able to fill?	Ms. Williams needs to cut 12 sheets of paper into fourths for a class project. How many fourth-sized papers will she have?	Esteban has a 6-foot board that he needs to cut into pieces that are each $\frac{1}{3}$-foot long. How many $\frac{1}{3}$-foot long pieces will he have?

Translate mathematical descriptions into numerical expressions and vice versa **MA.5.AR.2.1**

Write a numerical expression to match the description. ***"six and three-fifths multiplied by the sum of eight and twelve"***	Write a numerical expression to match the description. ***"the product of two and four less the quotient of nine and three."***	Write a numerical expression to match the description. ***"the difference of twenty-two and seven split into three equal parts"***
Put the numerical expression into word form. $\frac{1}{2} \times (3 + 7)$	Put the numerical expression into word form. $(9 + 4) \times (\frac{2}{5} - \frac{1}{3})$	Put the numerical expression into word form. $3.2 + \frac{1}{4}(18 - 2)$

Evaluate multi-step numerical expressions using order of operations. **MA.5.AR.2.2**

Evaluate. $(36 \div 3) - 2 \times 4$	Evaluate. $\frac{1}{2}(2 + 8 \times 6) - 5$	Evaluate. $60 - 2(10 - 2 \times 3)$	Evaluate. $100 - 64 \div 8 + 12 \times 2$

Determine whether an equation involving any of the four operations is true or false. **MA.5.AR.2.3**

True or false? How do you know? $21.1 - 8 + 4 = 9 \times 1.9$	True or false? How do you know? $6 \times 3.6 = 9 \times 2 + 0.4$

Write an equation with a variable to match the situation described **MA.5.AR.2.4**

Mrs. Ortega buys a box of 96 cookies. She plans to give the same number to each of the 18 students in her class. She wants 6 cookies remaining to bring home for her children. What is the greatest number of cookies each of Mrs. Ortega's students can receive? Write the equation and solve.	Nathan has 68 pieces of candy left over from Halloween. We wants to give the same number of candies to each of four friends, and to keep 8 pieces for himself. Write an equation that will show the greatest number of candies each friend will receive. Write the equation and solve.

Identify and write a rule that can describe the pattern as an expression **MA.5.AR.3.1**

What rule is shown by the pattern? 3, 7, 11, 15, 19	Which rule is shown by the pattern? 3, 6, 12, 24, 48	Which rule is shown by the pattern? 2, 8, 14, 20, 26	Which rule is shown by the pattern? 1, 3, 9, 27, 81

Use a two-column table to record the inputs and outputs for a numerical pattern **MA.5.AR.3.2**

Complete the table for the expression 2x + 1.

Input (x)	0	1	2	3
Output				

Complete the table for the expression 3x - 2.

Input (x)	2	4	6	8
Output				

5th Grade F.A.S.T. Fluency
Algebraic Reasoning – Worksheet 1

ANSWER KEY

Multi-step real-world problems with 4 operations		**MA.5.AR.1.1**
On Sunday, a bookstore received 18 boxes of new books. Each box contained 38 books. On Monday, the bookstore sold 71 of the new books. How many of the new books remain to be sold? 613 books	Jennifer has 132 trading cards. Carlos has 28 fewer trading cards than Jennifer. Maggie has twice as many trading cards as Carlos. How many trading cards do all three students have combined? 444 trading cards	There are 117 girls and 128 boys in the fifth-grade class. The entire 5th grade class is going on a field trip, using buses for transportation. If each bus holds 36 students, how many buses will they need for the field trip? 7 buses

Real-world problems involving the addition, subtraction or multiplication of fractions	**MA.5.AR.1.2**
Ericka is baking a cake. There are $5\frac{1}{4}$ cups of flour left in the bag, and she needs $2\frac{2}{3}$ cups of flour for the recipe. How much flour will be left in the bag after Ericka makes the cake? $2\frac{7}{12}$ cups	Marcus wants to make banana bread. The recipe calls for $1\frac{3}{4}$ cups of sugar for each loaf. Marcus is going to make 5 loaves of bread. How many cups of sugar will Marcus need? $8\frac{3}{4}$ cups
Yerica has $4\frac{1}{4}$ cups of berries. She uses $\frac{7}{8}$ cup of berries to make a smoothie. She then uses $1\frac{1}{2}$ cups for a fruit salad. After she makes her smoothie and fruit salad, how much of the berries will Yerica have left? $1\frac{7}{8}$ cups	Jason and Juan each had a birthday party on Saturday. Jason has $3\frac{2}{3}$ pizzas left over from the party. Juan has $1\frac{1}{2}$ times as many leftover pizzas as Jason. How many leftover pizzas does Juan have? $5\frac{1}{2}$ pizzas

Division of a unit fraction by a whole number and a whole number by a unit fraction		**MA.5.AR.1.3**
Adrianna has ½-gallon of mint chocolate chip ice cream. She wants to share her ice cream with 4 friends, but is not having any for herself. How much ice cream will each friend get? $\frac{1}{8}$ gallon	Stephanie has $\frac{1}{3}$-pound of candy that she wants to share equally between herself and two friends. What fraction of a pound of candy will each friend receive? $\frac{1}{9}$ pound	Clara has ½ of a pizza left over from lunch. She wants to split it up between four of her friends. What fraction of a whole pizza will each friend receive? A. one-half B. one-fourth C. one-sixth D. one-eighth
Jerrod has 6-pounds of candy he will use to fill treat bags for Halloween. Each bag holds $\frac{1}{8}$-pound of candy. How many bags will Jerrod be able to fill? 48 bags	Ms. Williams needs to cut 12 sheets of paper into fourths for a class project. How many fourth-sized papers will she have? 48 pieces	Esteban has a 6-foot board that he needs to cut into pieces that are each $\frac{1}{3}$-foot long. How many $\frac{1}{3}$-foot long pieces will he have? 18 pieces

Translate mathematical descriptions into numerical expressions and vice versa — **MA.5.AR.2.1**

Write a numerical expression to match the description. ***"six and three-fifths multiplied by the sum of eight and twelve"*** $6\frac{3}{5} \times (8 + 12)$	Write a numerical expression to match the description. ***"the product of two and four less the quotient of nine and three."*** $(2 \times 4) - (9 \div 3)$	Write a numerical expression to match the description. ***"the difference of twenty-two and seven split into three equal parts"*** $(22 - 7) \div 3$
Put the numerical expression into word form. $\frac{1}{2} \times (3 + 7)$ One-half the sum of three and seven	Put the numerical expression into word form. $(9 + 4) \times (\frac{2}{5} - \frac{1}{3})$ The sum of nine and four multiplied by the difference of two-fifths and one-third.	Put the numerical expression into word form. $3.2 + \frac{1}{4}(18 - 2)$ Three and two tenths plus one fourth of the difference of eighteen and two.

Evaluate multi-step numerical expressions using order of operations. — **MA.5.AR.2.2**

Evaluate. $(36 \div 3) - 2 \times 4$ 4	Evaluate. $\frac{1}{2}(2 + 8 \times 6) - 5$ 20	Evaluate. $60 - 2(10 - 2 \times 3)$ 52	Evaluate. $100 - 64 \div 8 + 12 \times 2$ 116

Determine whether an equation involving any of the four operations is true or false. — **MA.5.AR.2.3**

True or false? How do you know? $21.1 - 8 + 4 = 9 \times 1.9$ True, because both sides equal 17.1 when calculated.	True or false? How do you know? $6 \times 3.6 = 9 \times 2 + 0.4$ False, because the left side equals 21.6 and the right side equals 18.4

Write an equation with a variable to match the situation described — **MA.5.AR.2.4**

Mrs. Ortega buys a box of 96 cookies. She plans to give the same number to each of the 18 students in her class. She wants 6 cookies remaining to bring home for her children. What is the greatest number of cookies each of Mrs. Ortega's students can receive? Write the equation and solve. $96 = 18c + 6; c = 5$	Nathan has 68 pieces of candy left over from Halloween. We wants to give the same number of candies to each of four friends, and to keep 8 pieces for himself. Write an equation that will show the greatest number of candies each friend will receive. Write the equation and solve. $68 = 4c + 8; c = 15$

Identify and write a rule that can describe the pattern as an expression — **MA.5.AR.3.1**

What rule is shown by the pattern? 3, 7, 11, 15, 19 Add 4	Which rule is shown by the pattern? 3, 6, 12, 24, 48 Multiply by 2	Which rule is shown by the pattern? 2, 8, 14, 20, 26 Add 6	Which rule is shown by the pattern? 1, 3, 9, 27, 81 Multiply by 3

Use a two-column table to record the inputs and outputs for a numerical pattern — **MA.5.AR.3.2**

Complete the table for the expression 2x + 1.

Input (x)	0	1	2	3
Output	1	3	5	7

Complete the table for the expression 3x - 2.

Input (x)	2	4	6	8
Output	4	10	16	22

5th Grade F.A.S.T. Fluency Name: _____
Algebraic Reasoning – Worksheet 2

Multi-step real-world problems with 4 operations	**MA.5.AR.1.1**

On Friday, a bookstore received 23 boxes of new books. Each box contained 45 books. On Saturday, the bookstore sold 87 of the new books. How many of the new books remain to be sold?	Eduardo has 94 stamps in his stamp collection. Amy has 17 fewer stamps than Eduardo. Jillian has twice as many stamps as Eduardo. How many stamps do all three students have combined?	There are 124 girls and 98 boys in the 5th grade class. The class is going on a field trip, using buses for transportation. On the day of the field trip, 13 students are absent. If each bus holds 27 students, how many buses will they need for the field trip?

Real-world problems involving the addition, subtraction or multiplication of fractions	**MA.5.AR.1.2**

Tomas is baking a cake. There are $6\frac{1}{2}$ cups of flour left in the bag, and he needs $2\frac{3}{4}$ cups of flour for the recipe. How much flour will be left in the bag after Tomas makes the cake?	Antony wants to make 7 small apple pies. The recipe calls for $2\frac{2}{3}$ apples for each pie. How many apples will Marcus use for the pies?
Cleo mixes $2\frac{1}{2}$ cups of grape juice, $1\frac{3}{4}$ cups of apple juice, and $2\frac{2}{3}$ cups of cranberry juice to make a fruit punch. How many cups of fruit punch does she have in all?	Tony and Eliza each had a birthday party on Saturday. Tony has $2\frac{7}{8}$ pizzas left over from the party. Eliza has $1\frac{2}{3}$ times as many leftover pizzas as Tony. How many leftover pizzas does Eliza have?

Division of a unit fraction by a whole number and a whole number by a unit fraction	**MA.5.AR.1.3**

Jenny has ½-gallon of milk. She will divide the milk evenly between 8 thirsty kittens. How much milk will each kitten get?	Jeff has $\frac{1}{3}$ of a cake that he wants to share equally between himself and four friends. What fraction of a whole cake will each friend receive?	Edith has ½ of a chocolate bar. She wants to give it to her three friends, sharing it equally among them. What fraction of a whole chocolate bar will each friend receive? A. one-third B. one-fifth C. one-sixth D. one-eighth
Mason has 9-pounds of candy he will use to fill treat bags for Halloween. Each bag holds $\frac{1}{8}$-pound of candy. How many bags will Mason be able to fill?	Ms. Flores needs to cut 16 sheets of paper into fifths for a class project. How many fifth-sized pieces of paper will she have?	Terrence has a 12-foot board that he needs to cut into pieces that are each $\frac{1}{4}$-foot long. How many $\frac{1}{4}$-foot long pieces will he have?

Translate mathematical descriptions into numerical expressions and vice versa **MA.5.AR.2.1**

Write a numerical expression to match the description. ***"two and seven eighths multiplied by the difference of nine and two"***	Write a numerical expression to match the description. ***"the quotient of twelve and four subtracted from the sum of five and six."***	Write a numerical expression to match the description. ***"the product of eighteen and five split into six equal parts"***
Put the numerical expression into word form. $\frac{1}{3} \times (15 - 6)$	Put the numerical expression into word form. $(16 \div 2) \times (4 + 5)$	Put the numerical expression into word form. $1.9 \times \frac{1}{2}(24 + 6)$

Evaluate multi-step numerical expressions using order of operations. **MA.5.AR.2.2**

Evaluate. $(6 + 9 \times 2) \div 3$	Evaluate. $\frac{1}{2}(12 + 6) - 3 \times 2$	Evaluate. $45 - (15 - 6 \times 2)$	Evaluate. $5 + 24 \div 3 - 1 \times 2$

Determine whether an equation involving any of the four operations is true or false. **MA.5.AR.2.3**

True or false? How do you know? $20.5 - 4 \times 4 = 9 \times 0.5$	True or false? How do you know? $8 \times 1.2 = 0.6 \times 6 + 6$

Write an equation with a variable to match the situation described **MA.5.AR.2.4**

Mrs. Simpson buys a box of 108 cookies. She plans to give the same number to each of the 16 students in her class. She wants 12 cookies remaining to bring home for her children. What is the greatest number of cookies each of Mrs. Simpson's students can receive? Write the equation and solve.	David has 74 pieces of candy left over from his birthday party. We wants to give the same number of candies to each of five friends, and to keep 4 pieces for himself. Write an equation that will show the greatest number of candies each friend will receive. Write the equation and solve.

Identify and write a rule that can describe the pattern as an expression **MA.5.AR.3.1**

What rule is shown by the pattern? 1, 6, 11, 16, 21	Which rule is shown by the pattern? 40, 34, 28, 22, 16	Which rule is shown by the pattern? 4, 8, 16, 32, 64	Which rule is shown by the pattern? 4, 8, 12, 16, 20

Use a two-column table to record the inputs and outputs for a numerical pattern **MA.5.AR.3.2**

Complete the table for the expression 4x + 3.

Input (x)	0	1	2	3
Output				

Complete the table for the expression 7x - 4.

Input (x)	1	3	5	7
Output				

5th Grade F.A.S.T. Fluency
Algebraic Reasoning – Worksheet 2

ANSWER KEY

Multi-step real-world problems with 4 operations	**MA.5.AR.1.1**

On Friday, a bookstore received 23 boxes of new books. Each box contained 45 books. On Saturday, the bookstore sold 87 of the new books. How many of the new books remain to be sold? 948 books	Eduardo has 94 stamps in his stamp collection. Amy has 17 fewer stamps than Eduardo. Jillian has twice as many stamps as Eduardo. How many stamps do all three students have combined? 359 stamps	There are 124 girls and 98 boys in the 5th grade class. The class is going on a field trip, using buses for transportation. On the day of the field trip, 13 students are absent. If each bus holds 27 students, how many buses will they need for the field trip? 8 buses

Real-world problems involving the addition, subtraction or multiplication of fractions	**MA.5.AR.1.2**

Tomas is baking a cake. There are $6\frac{1}{2}$ cups of flour left in the bag, and he needs $2\frac{3}{4}$ cups of flour for the recipe. How much flour will be left in the bag after Tomas makes the cake? $3\frac{3}{4}$ cups	Antony wants to make 7 small apple pies. The recipe calls for $2\frac{2}{3}$ apples for each pie. How many apples will Marcus use for the pies? $17\frac{2}{3}$ cups
Cleo mixes $2\frac{1}{2}$ cups of grape juice, $1\frac{3}{4}$ cups of apple juice, and $2\frac{2}{3}$ cups of cranberry juice to make a fruit punch. How many cups of fruit punch does she have in all? $6\frac{11}{12}$ cups	Tony and Eliza each had a birthday party on Saturday. Tony has $2\frac{7}{8}$ pizzas left over from the party. Eliza has $1\frac{2}{3}$ times as many leftover pizzas as Tony. How many leftover pizzas does Eliza have? $4\frac{19}{24}$ pizzas

Division of a unit fraction by a whole number and a whole number by a unit fraction	**MA.5.AR.1.3**

Jenny has ½-gallon of milk. She will divide the milk evenly between 8 thirsty kittens. How much milk will each kitten get? $\frac{1}{16}$ gallon	Jeff has $\frac{1}{3}$ of a cake that he wants to share equally between himself and four friends. What fraction of a whole cake will each friend receive? $\frac{1}{15}$ cake	Edith has ½ of a chocolate bar. She wants to give it to her three friends, sharing it equally among them. What fraction of a whole chocolate bar will each friend receive? A. one-third B. one-fifth C. one-sixth D. one-eighth
Mason has 9-pounds of candy he will use to fill treat bags for Halloween. Each bag holds $\frac{1}{8}$-pound of candy. How many bags will Mason be able to fill? 72 bags	Ms. Flores needs to cut 16 sheets of paper into fifths for a class project. How many fifth-sized pieces of paper will she have? 80 pieces	Terrence has a 12-foot board that he needs to cut into pieces that are each $\frac{1}{4}$-foot long. How many $\frac{1}{4}$-foot long pieces will he have? 48 pieces

Translate mathematical descriptions into numerical expressions and vice versa — **MA.5.AR.2.1**

Write a numerical expression to match the description. ***"two and seven eighths multiplied by the difference of nine and two"*** $2\frac{7}{8} \times (9 - 2)$	Write a numerical expression to match the description. ***"the quotient of twelve and four subtracted from the sum of five and six."*** $(5 + 6) - (12 \div 4)$	Write a numerical expression to match the description. ***"the product of eighteen and five split into six equal parts"*** $(18 \times 5) \div 6$
Put the numerical expression into word form. $\frac{1}{3} \times (15 - 6)$ One-third the difference of fifteen and six	Put the numerical expression into word form. $(16 \div 2) \times (4 + 5)$ The quotient of sixteen and two multiplied by the sum of four and five.	Put the numerical expression into word form. $1.9 \times \frac{1}{2}(24 + 6)$ One and nine tenths times one half of the sum of twenty-four and six.

Evaluate multi-step numerical expressions using order of operations. — **MA.5.AR.2.2**

Evaluate. $(6 + 9 \times 2) \div 3$ 8	Evaluate. $\frac{1}{2}(12 + 6) - 3 \times 2$ 3	Evaluate. $45 - (15 - 6 \times 2)$ 42	Evaluate. $5 + 24 \div 3 - 1 \times 2$ 11

Determine whether an equation involving any of the four operations is true or false. — **MA.5.AR.2.3**

True or false? How do you know? $20.5 - 4 \times 4 = 9 \times 0.5$ True, because both sides equal 4.5 when calculated.	True or false? How do you know? $8 \times 1.2 = 0.6 \times 6 + 6$ True, because both sides equal 9.6 when calculated.

Write an equation with a variable to match the situation described — **MA.5.AR.2.4**

Mrs. Simpson buys a box of 108 cookies. She plans to give the same number to each of the 16 students in her class. She wants 12 cookies remaining to bring home for her children. What is the greatest number of cookies each of Mrs. Simpson's students can receive? Write the equation and solve. $108 = 16c + 12;\ c = 6$	David has 74 pieces of candy left over from his birthday party. We wants to give the same number of candies to each of five friends, and to keep 4 pieces for himself. Write an equation that will show the greatest number of candies each friend will receive. Write the equation and solve. $74 = 5c + 4;\ c = 14$

Identify and write a rule that can describe the pattern as an expression — **MA.5.AR.3.1**

What rule is shown by the pattern? 1, 6, 11, 16, 21 Add 5	Which rule is shown by the pattern? 40, 34, 28, 22, 16 Subtract 6	Which rule is shown by the pattern? 4, 8, 16, 32, 64 Multiply by 2	Which rule is shown by the pattern? 4, 8, 12, 16, 20 Add 4

Use a two-column table to record the inputs and outputs for a numerical pattern — **MA.5.AR.3.2**

Complete the table for the expression 4x + 3.

Input (x)	0	1	2	3
Output	3	7	11	15

Complete the table for the expression 7x - 4.

Input (x)	1	3	5	7
Output	3	17	31	45

5th Grade F.A.S.T. Fluency Name: _____
Algebraic Reasoning – Worksheet 3

Multi-step real-world problems with 4 operations	**MA.5.AR.1.1**

On Tuesday, a toy store received a shipment of 18 boxes of new toys. Each box contained 64 toys. On Wednesday, the store sold 126 of the new toys. How many of the new toys remain to be sold?	Kathy has $148 saved up. Jackeline has $15 more than Kathy. Lana has twice as much money saved as Jackeline. How much money do the three girls have combined?	There are 117 girls and 125 boys in the 5th grade class. The class is going on a field trip, using buses for transportation. On the day of the field trip, 19 students are absent. If each bus holds 32 students, how many buses will they need for the field trip?

Real-world problems involving the addition, subtraction or multiplication of fractions	**MA.5.AR.1.2**

Benson is making tortillas. The recipe calls for $3\frac{5}{8}$ cups of flour. There are $5\frac{1}{2}$ cups of flour left in the bag. How much flour will be left in the bag after Benson makes the tortillas?	Pedro wants to make 8 blueberry pies. The recipe calls for $3\frac{1}{3}$ cups of blueberries for each pie. How many cups of blueberries will Pedro need for the pies?
Jessie mixes $1\frac{7}{8}$ cups of grape juice, $2\frac{1}{2}$ cups of apple juice, and $2\frac{1}{4}$ cups of pineapple juice to make a fruit punch. How many cups of fruit punch does she have in all?	Three siblings went trick-or-treating on Halloween. Jenny got $2\frac{1}{2}$ pounds of candy. Liz got $\frac{1}{2}$ the amount of candy that Jenny got. Teri got twice as much candy as Jenny and Liz got combined. How many pounds of candy did Teri get?

Division of a unit fraction by a whole number and a whole number by a unit fraction	**MA.5.AR.1.3**

Liam has ¼-gallon of milk. He will divide the milk evenly between 3 thirsty kittens. How much milk will each kitten get?	Jeff has $\frac{1}{2}$ of a pie that he wants to share equally between himself and three friends. What fraction of a whole pie will each friend receive?	Edith has $\frac{1}{3}$ of a pizza. She wants to give it to her two friends, sharing it equally among them. What fraction of a whole pizza will each friend receive? A. one-half B. one-sixth C. one-third D. one-fourth
Jeremy has 3-pounds of candy he will use to fill treat bags for his birthday party. Each bag holds $\frac{1}{6}$-pound of candy. How many bags will Jeremy be able to fill?	Carter needs to put sheets of tissue paper into gift bags. He has 12 large sheets of tissue paper, and will cut each large sheet into fourths. How many gift bags can he make?	Allison has a 15-foot rope that she cuts into pieces that are each $\frac{1}{5}$-foot long. How many $\frac{1}{5}$-foot long pieces of rope does she have?

Translate mathematical descriptions into numerical expressions and vice versa **MA.5.AR.2.1**

Write a numerical expression to match the description. ***"the sum of one and three fourths and four multiplied by nine"***	Write a numerical expression to match the description. ***"the difference of twenty and two divided by the product of two and three."***	Write a numerical expression to match the description. ***"the quotient of twenty-eight and four less the sum of one and six"***
Put the numerical expression into word form. $(24 \times 2) - (16 \div 4)$	Put the numerical expression into word form. $\frac{1}{5} \times (15 + 25)$	Put the numerical expression into word form. $2.1 \times \frac{1}{3}(30 - 18)$

Evaluate multi-step numerical expressions using order of operations. **MA.5.AR.2.2**

Evaluate. $(19 - 9 \times 2) + 14$	Evaluate. $\frac{1}{4}(32 - 4) \times 2 + 3$	Evaluate. $40 - 5 \times 6 + 18 \div 3$	Evaluate. $9 + 36 \div 4 - 6 \times 3$

Determine whether an equation involving any of the four operations is true or false. **MA.5.AR.2.3**

True or false? How do you know? $6 \times 1.2 = 8 + 4 \times 0.6$	True or false? How do you know? $5 \times 1.8 = 4 \times 2.5 - 1$

Write an equation with a variable to match the situation described **MA.5.AR.2.4**

Adriana buys 90 boxes of girl scout cookies. She plans to sell the same number of boxes each day for 7 days. She also wants to keep 6 boxes for herself. What is the greatest number of boxes Adriana needs to sell per day? Write the equation and solve.	Carlos bought 112 trading cards to share equally with 6 of his friends. He only wants to keep 4 of the cards for himself. Write an equation that will show the greatest number of cards each friend will receive. Write the equation and solve.

Identify and write a rule that can describe the pattern as an expression **MA.5.AR.3.1**

What rule is shown by the pattern? 2, 5, 8, 11, 14	Which rule is shown by the pattern? 1, 4, 16, 64, 256	Which rule is shown by the pattern? 50, 44, 38, 32, 26	Which rule is shown by the pattern? 4, 13, 22, 31, 40

Use a two-column table to record the inputs and outputs for a numerical pattern **MA.5.AR.3.2**

Complete the table for the expression 2x + 7.

Input (x)	0	1	2	3
Output				

Complete the table for the expression 8x - 3.

Input (x)	3	4	5	7
Output				

5th Grade F.A.S.T. Fluency
Algebraic Reasoning – Worksheet 3

ANSWER KEY

Multi-step real-world problems with 4 operations	**MA.5.AR.1.1**

On Tuesday, a toy store received a shipment of 18 boxes of new toys. Each box contained 64 toys. On Wednesday, the store sold 126 of the new toys. How many of the new toys remain to be sold? 1,026 toys	Kathy has $148 saved up. Jackeline has $15 more than Kathy. Lana has twice as much money saved as Jackeline. How much money do the three girls have combined? $637	There are 117 girls and 125 boys in the 5th grade class. The class is going on a field trip, using buses for transportation. On the day of the field trip, 19 students are absent. If each bus holds 32 students, how many buses will they need for the field trip? 7 buses

Real-world problems involving the addition, subtraction or multiplication of fractions	**MA.5.AR.1.2**

Benson is making tortillas. The recipe calls for $3\frac{5}{8}$ cups of flour. There are $5\frac{1}{2}$ cups of flour left in the bag. How much flour will be left in the bag after Benson makes the tortillas? $1\frac{7}{8}$ cups	Pedro wants to make 8 blueberry pies. The recipe calls for $3\frac{1}{3}$ cups of blueberries for each pie. How many cups of blueberries will Pedro need for the pies? $26\frac{2}{3}$ cups
Jessie mixes $1\frac{7}{8}$ cups of grape juice, $2\frac{1}{2}$ cups of apple juice, and $2\frac{1}{4}$ cups of pineapple juice to make a fruit punch. How many cups of fruit punch does she have in all? $6\frac{5}{8}$ cups	Three siblings went trick-or-treating on Halloween. Jenny got $2\frac{1}{2}$ pounds of candy. Liz got $\frac{1}{2}$ the amount of candy that Jenny got. Teri got twice as much candy as Jenny and Liz got combined. How many pounds of candy did Teri get? $7\frac{1}{2}$ pounds

Division of a unit fraction by a whole number and a whole number by a unit fraction	**MA.5.AR.1.3**

Liam has ¼-gallon of milk. He will divide the milk evenly between 3 thirsty kittens. How much milk will each kitten get? $\frac{1}{12}$ gallon	Jeff has $\frac{1}{2}$ of a pie that he wants to share equally between himself and three friends. What fraction of a whole pie will each friend receive? $\frac{1}{8}$ pie	Edith has $\frac{1}{3}$ of a pizza. She wants to give it to her two friends, sharing it equally among them. What fraction of a whole pizza will each friend receive? A. one-half B. one-sixth C. one-third D. one-fourth
Jeremy has 3-pounds of candy he will use to fill treat bags for his birthday party. Each bag holds $\frac{1}{6}$-pound of candy. How many bags will Jeremy be able to fill? 18 bags	Carter needs to put sheets of tissue paper into gift bags. He has 12 large sheets of tissue paper, and will cut each large sheet into fourths. How many gift bags can he make? 48 gift bags	Allison has a 15-foot rope that she cuts into pieces that are each $\frac{1}{5}$-foot long. How many $\frac{1}{5}$-foot long pieces of rope does she have? 75 pieces

Translate mathematical descriptions into numerical expressions and vice versa — **MA.5.AR.2.1**

Write a numerical expression to match the description. ***"the sum of one and three fourths and four multiplied by nine"*** $(1\frac{3}{4} + 4) \times 9$	Write a numerical expression to match the description. ***"the difference of twenty and two divided by the product of two and three."*** $(20 - 2) \div (2 \times 3)$	Write a numerical expression to match the description. ***"the quotient of twenty-eight and four less the sum of one and six"*** $(28 \div 4) - (1 + 6)$
Put the numerical expression into word form. **$(24 \times 2) - (16 \div 4)$** The product of twenty-four and two less the quotient of sixteen and four	Put the numerical expression into word form. **$\frac{1}{5} \times (15 + 25)$** One-fifth of the sum of fifteen and twenty-five.	Put the numerical expression into word form. **$2.1 \times \frac{1}{3}(30 - 18)$** Two and one tenth times one third of the difference of thirty and eighteen.

Evaluate multi-step numerical expressions using order of operations. — **MA.5.AR.2.2**

Evaluate. **$(19 - 9 \times 2) + 14$** 15	Evaluate. **$\frac{1}{4}(32 - 4) \times 2 + 3$** 17	Evaluate. **$40 - 5 \times 6 + 18 \div 3$** 16	Evaluate. **$9 + 36 \div 4 - 6 \times 3$** 0

Determine whether an equation involving any of the four operations is true or false. — **MA.5.AR.2.3**

True or false? How do you know? **$6 \times 1.2 = 8 + 4 \times 0.6$** False, because the left side equals 7.2 and the right side equals 10.4.	True or false? How do you know? **$5 \times 1.8 = 4 \times 2.5 - 1$** True, because both sides equal 9 when calculated.

Write an equation with a variable to match the situation described — **MA.5.AR.2.4**

Adriana buys 90 boxes of girl scout cookies. She plans to sell the same number of boxes each day for 7 days. She also wants to keep 6 boxes for herself. What is the greatest number of boxes Adriana needs to sell per day? Write the equation and solve. $90 = 7c + 6$; $c = 12$	Carlos bought 112 trading cards to share equally with 6 of his friends. He only wants to keep 4 of the cards for himself. Write an equation that will show the greatest number of cards each friend will receive. Write the equation and solve. $74 = 5c + 4$

Identify and write a rule that can describe the pattern as an expression — **MA.5.AR.3.1**

What rule is shown by the pattern? 2, 5, 8, 11, 14 Add 3	Which rule is shown by the pattern? 1, 4, 16, 64, 256 Multiply by 4	Which rule is shown by the pattern? 50, 44, 38, 32, 26 Subtract 6	Which rule is shown by the pattern? 4, 13, 22, 31, 40 Add 9

Use a two-column table to record the inputs and outputs for a numerical pattern — **MA.5.AR.3.2**

Complete the table for the expression 2x + 7.

Input (x)	0	1	2	3
Output	7	9	11	13

Complete the table for the expression 8x - 3.

Input (x)	3	4	5	7
Output	21	29	37	53