



Preview – Information



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Google Slides Lessons Preview





Saskatchewan Math Curriculum Patterns & Relations – Grade 6

3-Part Lesson Format

Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!

LEARNING GOAL

We are learning to analyze input-output tables using the four operations (+, -, x, ÷) to determine how numbers change and to find the pattern rule that connects them.

Input/Output Table									
Fill in the tables below.									
RULE = Add 10		RULE = Add 7		RULE = Subtract 13		RULE = Multiply 4		RULE = Divide 3	
In	Out	In	Out	In	Out	In	Out	In	Out
21			36	43		11		9	
70		67		97			36	27	
	22	177			200	23			11
793			468	503			48	36	
852		789			854	50			15

Part 2 – Action!

- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

Part 3 – Consolidation!

- Exit Cards
- Quizzes
- Reflection
- And More!

Word Problems – Fence Panels

Complete the table and answer the questions below.

A gardener is building a fence around a flower bed. Each day, the gardener adds more fence panels. What could the pattern rule be? How do you know?

Term Number (Days)	1	2	3	4	5	6	7	8	9	10
Term Value (Fence Panels)										

1) Why is this a linear pattern?

2) Extend the line on the graph.

3) What will be the 7th and 12th term value?
7th term _____ 12th term _____



Saskatchewan Math Curriculum

Patterns & Relations – Grade 6

Increasing Linear Patterns - Yes or No? ☐

Circle if the pattern displayed on the graph is linear or not.

1) ☐ Linear ☐ Non-Linear

2) ☐ Linear ☐ Non-Linear

by deciding whether Nikhil is describing the recursive relationship or the functional relationship.

	Pattern					Nikhil's Description	Recursive or Functional
1)	x	1	2	3	4	The pattern goes up by 6 each time.	
	y	9	15	21	27		
2)	x	5	10	15	20	The term number is multiplied by 7.	
	y	35	70	105	140		
3)	x	1	2	3	4	The term number is multiplied by 3 and then 4 is added.	
	y	7	10	13	16		
4)	x	1	2	3	4	The pattern goes up by 8 each time.	
	y	12	20	28	36		
5)	x	1	2	3	4	$9x + 5$	
	y	14	23	32	41		

Table of Values

Use the algebraic expression to fill in the tables.

$3x + 5$		$6x - 4$		$20 \div x + 7$	
Term Number	Term Value	Term Number	Term Value	Term Number	Term Value
0		1		1	
1		2		2	
2		3		3	
3		4		4	
4		5		5	
12		15		10	



Saskatchewan Math Curriculum Patterns & Relations – Grade 6

Word Problem - T-Tables

Enna is planning a birthday party and arranging triangle tables for guests. Her goal is to fit as many guests as possible in the room. The diagram below shows how the number of seats increases as more tables are added.

1 Table

2 Tables

3 Tables

Term Number (tables)	1	2	3	4	5	20
Term Value (# of seats)						

Write an algebraic expression that represents the function. _____

How many people could be seated if she had...

a) 11 tables b) 25 tables

What if you didn't put the tables together? Would 9 tables together fit more or less than 9 tables apart?

T-Tables - Finding Block Patterns

Fill in the T-Tables by counting the lines in each shape.

1)

Figure	1	2	3	4
Lines				

2)

Figure	1	2	3	5
Lines				

3)

Figure	1	2	3	7
Lines				

4)

Figure	1	2	3	8
Lines				

Write four different expressions that represent the number 9. Use $g = 4$.

1)	2)
3)	4)



Workbook Preview



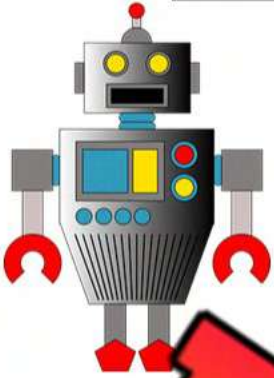
Grade 6

Patterns and Relationships



	Curriculum Expectations	Pages
P6.1	Extend understanding of patterns and relationships in tables of values and graphs.	5 – 47
P	Preview of 115 pages from this product that contains 261 pages total.	
P6.3	Extend understanding of patterns and relationships by using expressions and equations involving variables.	51-129
TQ	Tests and quizzes	48-50, 133-135

Pattern Rule – Input/Output Tables



Rule: add 10	
In	Out
20	30
30	40
50	60
90	100



Instructions: Complete the input/output tables below

Rule: add 29	
In	Out
43	
	72
	91
113	

Rule: add 3	
In	Out
24	
41	
	87

Rule: add 8	
In	Out
71	
	94
113	
	149

Rule: subtract 7	
In	Out
	58
96	
	131
164	

Rule: subtract 4	
In	Out
112	
153	
	177
	193

Rule: subtract 12	
In	Out
	141
	168
199	

Rule: subtract 11	
In	Out
	215
	268
292	
305	

Rule: add 13	
In	Out
	326
361	
385	
	400

Rule: add 15	
In	Out
412	
436	
	468
	497

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Fill in the input/output tables below

Rule: add 9	
In	Out
49	
	91

Rule: subtract 8	
In	Out
17	
	53

Name: _____

Fill in the input/output tables below

Rule: add 7	
In	Out
49	
	91

Rule: subtract 8	
In	Out
217	
	356

Name: _____

Fill in the input/output tables below

Rule: add 7	
In	Out
49	
	91

Rule: subtract 8	
In	Out
17	
	53

Name: _____

Fill in the input/output tables below

Rule: add 7	
In	Out
49	
	91

Rule: subtract 8	
In	Out
17	
	53

Input/Output Table – Multiplication



Rule: multiply by 2

In	Out
3	6
5	10
7	14
9	18

Instructions: Complete the input/output tables below

Rule: multiply by 3

In	Out
5	
10	
20	
50	

Rule: multiply by 6

In	Out
3	
7	
10	
12	

Rule: multiply by 5

In	Out
5	
10	
20	
50	

Rule: multiply by 4

In	Out
7	
12	
15	
25	

Rule: multiply by 3

In	Out
21	
33	
50	
110	

Rule: multiply by 7

In	Out
8	
12	
20	

Rule: multiply by 8

In	Out
5	
10	
20	
100	

Rule: multiply by 10

In	Out
8	
11	
16	
31	

Rule: multiply by 11

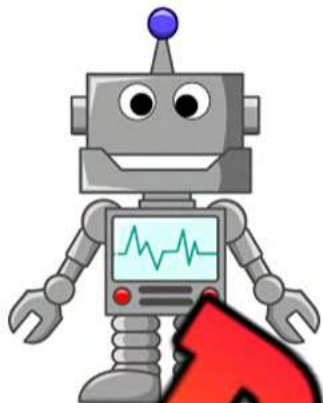
In	Out
6	
8	
10	
20	

Name: _____

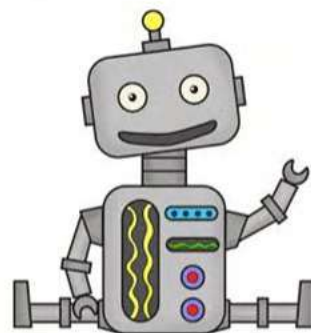
10

Curriculum Connection
P6.1

Input/Output Table – Division



Rule: divide by 2	
In	Out
10	5
8	4
6	3
4	2



Instructions: Complete the input/output tables below

Rule: divide by 1	
In	Out
10	
25	
78	
98	

Rule: divide by 2	
In	Out
14	
30	
46	
72	

Rule: divide by 5	
In	Out
25	
65	
80	
100	

Rule: divide by 3	
In	Out
12	
24	
39	
45	

Rule: divide by 4	
In	Out
16	
36	
48	
64	

Rule: divide by 6	
In	Out
30	
54	
78	

Rule: divide by 9	
In	Out
18	
45	
72	
108	

Rule: divide by 10	
In	Out
20	
70	
120	
180	

Rule: divide by 8	
In	Out
16	
40	
72	
104	

Pattern Rule – Input/Output Tables



Instructions

Fill in the input/output tables below

Rule: Subtract 16

In	Out
49	
7	
	82
	101

Rule: add 14

In	Out
81	
127	
	174
	201

Rule: Multiply by 2

In	Out
15	
42	
	120
	164

Rule: Multiply by 3

In	Out
12	
31	
	120
	183

Rule: Divide by 2

In	Out
28	
42	
	36
	51

Rule: Divide by 5

In	Out
20	
45	
	12
	18

Rule: Subtract by 19

In	Out
147	
182	
	240
	276

Rule: Add 21

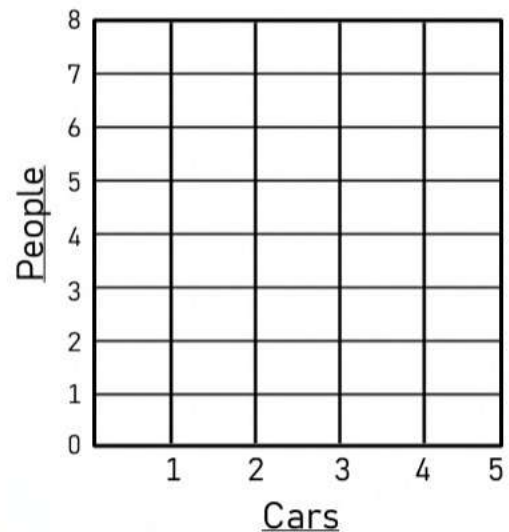
In	Out
305	
328	
	364
	378

Graphing Patterns – Table of Values

Instructions

Translate the increasing pattern into a table of values and a graph

A train has the following people in each train car.



Term Number (Cars)	1	2	4	5	8
Term Value (People)					

1) What is the pattern rule? Start at _____, _____ each time

2) How many people would be in train car 10?

3) Is the line on the graph straight or curved? Why do you think that is?

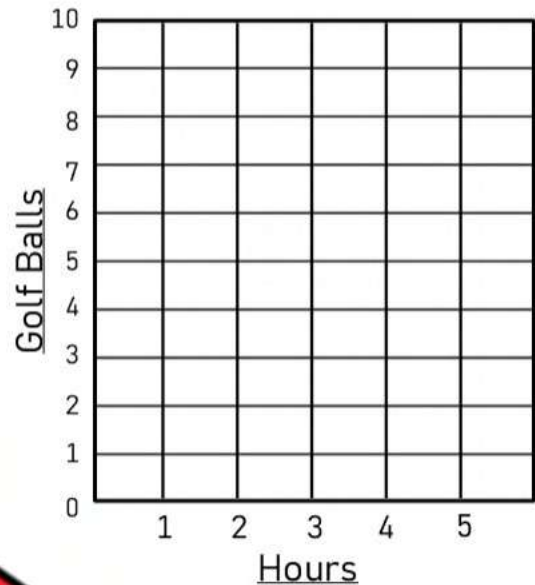
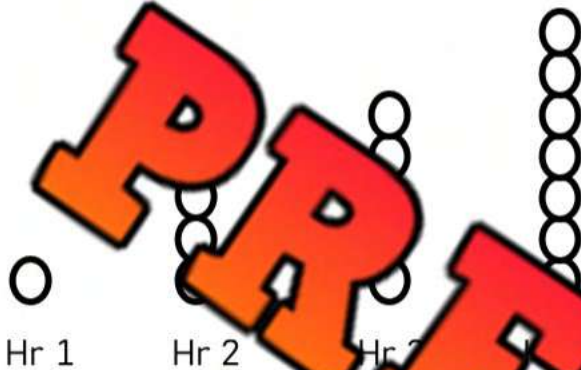
4) How many people would be in train car 20?

Graphing Patterns – Table of Values

Instructions

Translate the increasing pattern into a table of values and a graph

Steven is looking for golf balls in the woods. He finds the following balls each hour.



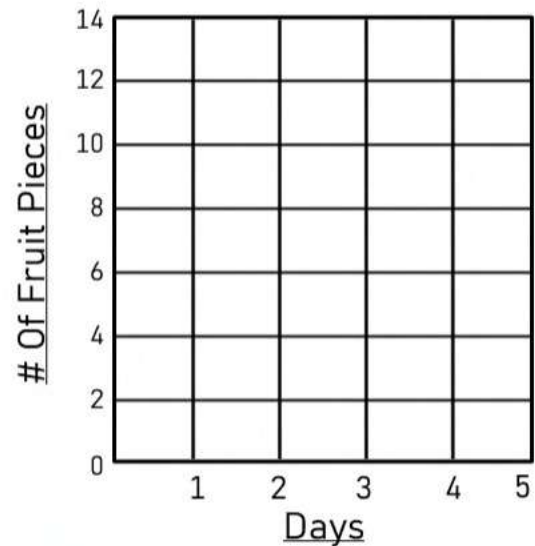
Term Number (Hour)	1	2	3	4	5	9
Term Value (Golf Balls)						

- 1) What is the pattern rule? Start at _____, _____ in time
- 2) How many golf balls would Steven find in his 12th hour of looking
- 3) If the graph continued, could a straight line that continued tell you a future term number? Explain.
- 4) What hour would Steven find 27 golf balls?

Graphing Patterns – Table of Values

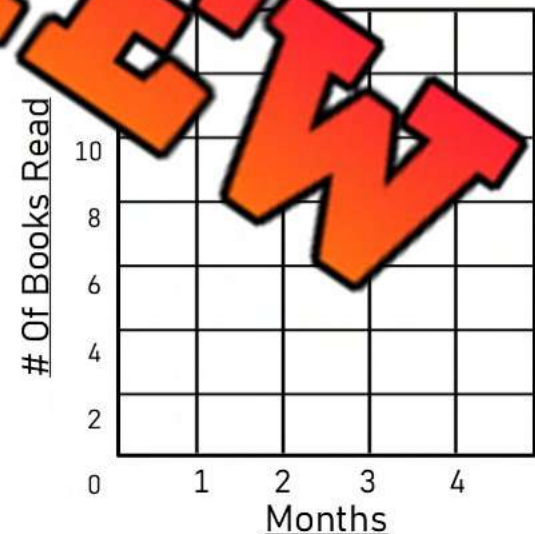
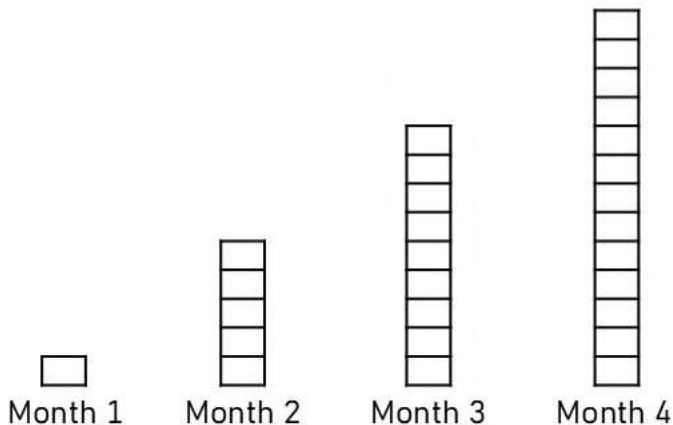
Instructions Translate the increasing patterns into a table of values and a graph

1) Stacy marks an x each day for how many pieces of fruit she eats.



Term Number (Day)	1	2	3	4	5	6	10
Term Value (Fruit Pieces)							

2) Chris puts a rectangle for every book he reads in the first 5 months of school.

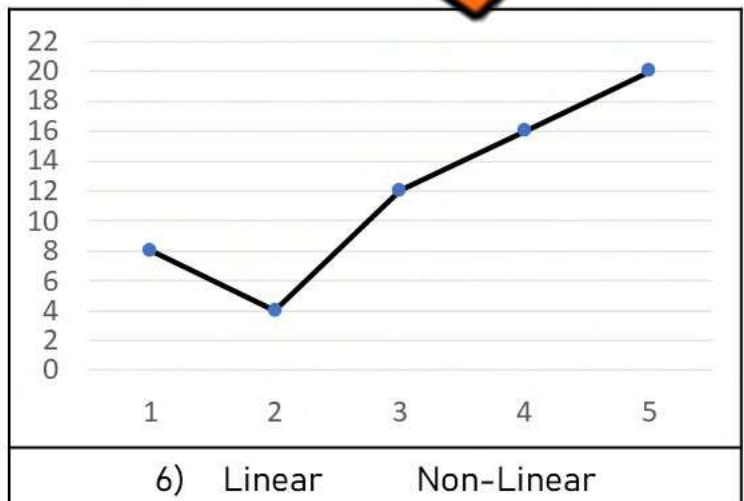
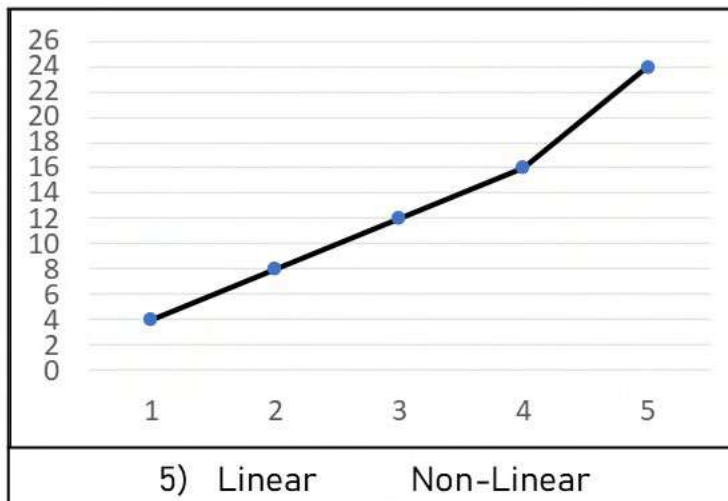
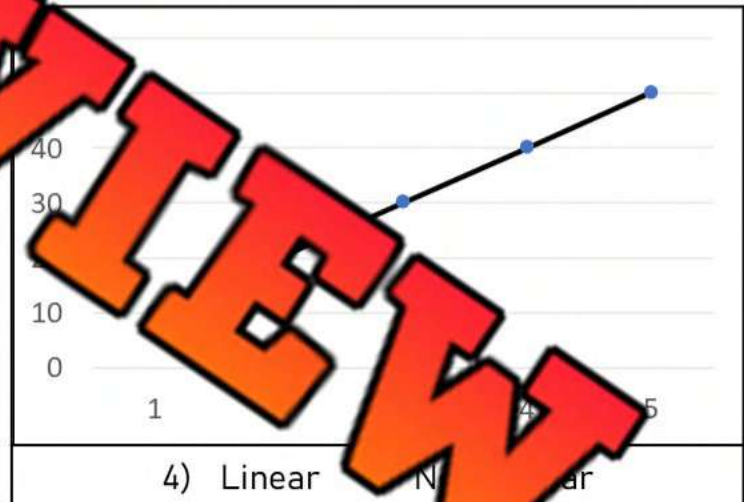
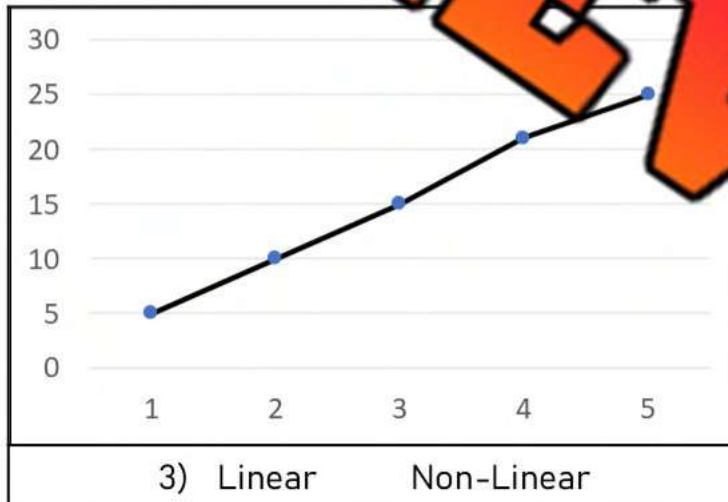
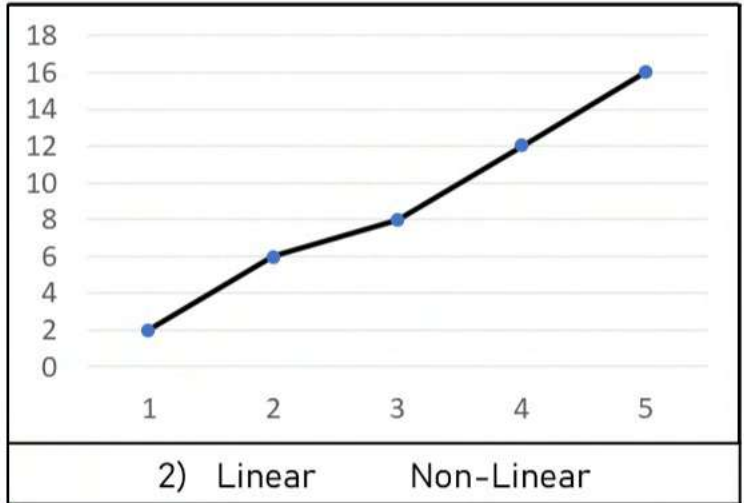
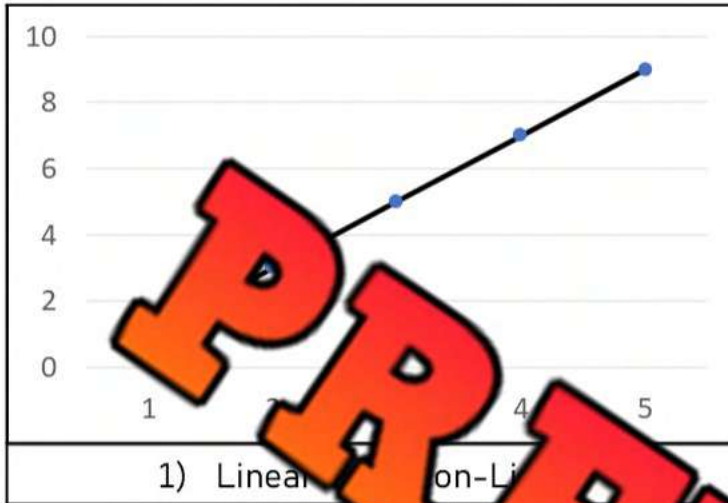


Term Number (Month)					5	9
Term Value (Books Read)						

Increasing Linear Patterns – Yes or No?

Instructions

Circle if the pattern displayed on the graph is linear or not



Increasing Linear Patterns – Yes or No?

Instructions

Circle if the pattern is linear or not, based on the table of values

Term Number	Term Value
1	2
2	6
3	10
4	14
5	18
Linear	Non-Linear

Term Number	Term Value
1	10
2	16
3	20
4	26
5	32
Linear	Non-Linear

Term Number	Term Value
1	15
2	18
3	21
4	25
5	28
Linear	Non-Linear

Term Number	Term Value
1	14
2	19
3	24
4	29
5	34
Linear	Non-Linear

Term Number	Term Value
1	2
2	5
3	8
4	11
5	14
Linear	Non-Linear

Term Number	Term Value
1	25
2	75
3	125
4	175
5	225
Linear	Non-Linear

Term Number	Term Value
1	112
2	126
3	138
4	152
5	166
Linear	Non-Linear

Term Number	Term Value
1	210
2	260
3	310
4	360
5	410
Linear	Non-Linear

Term Number	Term Value
1	500
2	650
3	700
4	850
5	1000
Linear	Non-Linear

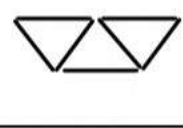
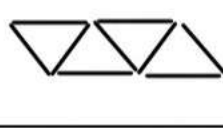
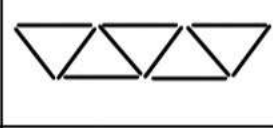
Toothpick Linear Patterns

A **linear** pattern is a pattern that increases or decreases by a value that remains the same. Linear patterns can be plotted as a straight line on a graph.

Instructions

Answer the questions below using a table of values and a graph

Kelly has made a pattern using toothpicks. She has displayed her pattern below.

				
Term 1	Term 2	Term 3	Term 4	Term 5



- 1) Why is this a linear pattern?
- 2) Extend the line on the graph. What will be the 7th and 10th term value?
7th term _____ 10th term _____

Recursive vs Functional Relationships

In a linear pattern, we can have a recursive or functional relationship between variables. A **recursive relationship** describes the pattern between successive numbers in one of the rows/columns of a table of values.

A **functional relationship** is a general rule to describe the relationship between the dependent and independent variable in a table of values. To find the **function**, we look across the table instead of beside.



Part 1 Jeffrey describing the recursive or functional relationship?

	a					Jeffrey's Description	Recursive or Functional
1)	x	1	2	3	4	The pattern goes up by 3 each time.	
	y	5	8	11	14		
2)	x	10	20	30	40	The term number is multiplied by 10	
	y	100	200	300	400		
3)	x	1	2	3	4	The term number is multiplied by 4 and then 1 is added	
	y	5	9	13	17		
4)	x	1	2	3	4	The pattern goes up by 4 each time	
	y	8	12	16	20		
5)	x	1	2	3	4	$7x + 11$	
	y	18	25	32	39		

Part 2 Provide a recursive and functional description of the patterns

	Pattern					Recursive	
1)	x	1	2	3	4	Functional	
	y	3	9	15	21		
	Pattern					Recursive	
2)	x	1	2	3	4	Functional	
	y	12	20	28	36		

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Provide a recursive and functional description of the pattern.

x	1	2	3	4
y	10	18	26	34

Recursive

Functional

Name: _____

Provide a recursive and functional description of the pattern.

x	1	2	3	4
y	10	18	26	34

Recursive

Functional

Name: _____

Provide a recursive and functional description of the pattern.

x	1	2	3	4
y	10	18	26	34

Recursive

Functional

Name: _____

Provide a recursive and functional description of the pattern.

x	1	2	3	4
y	10	18	26	34

Recursive

Functional

Functions – Finding Term N

When finding a random term in a pattern, we can use a variable. Often n is used to take the place of the term number. When we use n , we can change the value to find the term value for any term number.

We can find the value for n by looking at the pattern between the independent and dependent variable. To do this, we look across the table from the term number to the term value.

Tip: To find the function, determine how many is added from one term value to the next. Try using this number as multiplication in your expression. If it doesn't work, you may need to add or subtract in addition to using multiplication to find the function.



Practice Finding the function by determining the pattern between the variables

Term Number	Term Value
1	3
2	6
3	9
4	12
5	15
8	

$3n$

Term Number	Term Value
1	1
2	3
3	5
4	7
5	9
9	

$2n-1$

Term Number	Term Value
1	4
2	5
3	6
4	7
5	8
10	

Term Number	Term Value
1	3
2	5
3	7
4	9
5	11
9	

Term Number	Term Value
1	4
2	7
3	10
4	13
5	16
10	

Term Number	Term Value
1	16
2	22
3	28
4	34
5	40
11	

Using Algebraic Expressions

In the expression $6y + 5$, the 6 is the **numerical coefficient** of the variable and the 5 is the **constant term**. The **variable** is the y , which represents the changing value.

Part 1

Use the algebraic expression to fill in the tables

Term Number	Term Value
1	4
2	7
3	
4	
5	
8	

$$3n + 1$$

Term Number	Term Value
1	
2	
3	
9	

Term Number	Term Value
1	
2	
3	
4	
5	
11	

$$n + 7$$

Term Number	Term Value
1	
2	
3	
4	
5	
11	

$$5n - 5$$

Term Number	Term Value
1	
2	
4	
5	
10	
20	

$$2n + 11$$

Term Number	Term Value
5	
11	

$$9n - 4$$

Part 2

Write 4 algebraic expressions using:

Variable = n Constant term = 6 Numerical coefficient = 3

1	
2	

3	
4	

Pattern Rule – Input/Output Tables

Instructions

Use the function to fill in the table



In n	Out $2n$
1	2
2	
3	6
4	
5	

In n	Out $2n + 5$
1	
2	
3	
4	

In n	Out $5n - 2$
1	
2	
3	
4	
5	

In x	Out $2x - 3$
10	
20	
30	
40	
50	

In x	Out $x - 1$
2	
4	
6	
8	
10	

In x	Out $4x + 8$
1	
2	
3	
4	
5	

In p	Out $2p + 10$
20	
40	
60	
80	
100	

In p	Out $10p - 8$
3	
6	
9	
12	
15	

In p	Out $5p - 20$
5	
10	
15	
20	
25	

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Use the function to fill in the table.

	Out $8 + 3$
2	
4	
6	
8	
10	

Name: _____

Use the function to fill in the table.

In h	Out $8h - 8 + 3$
2	
4	
6	
8	
10	

Name: _____

Use the function to fill in the table.

In h	Out $8h - 8 + 3$
2	
4	
6	
8	
10	

Name: _____

Use the function to fill in the table.

In h	Out $8h - 8 + 3$
2	
4	
6	
8	
10	

Growing Pattern Challenge

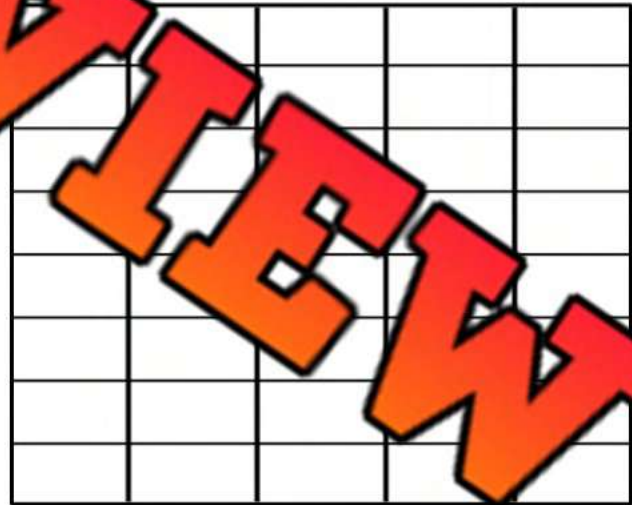
Instructions

Answer the question below using a table of values and a graph

Joel has created a pattern using his blocks. Translate the pattern using the table of values and graph.



Term Number	Term Value



1) How many blocks would Joel use in his 10th shape if he continued his pattern?

2) Write an expression that represents the function

3) Which shape would use 63 blocks?

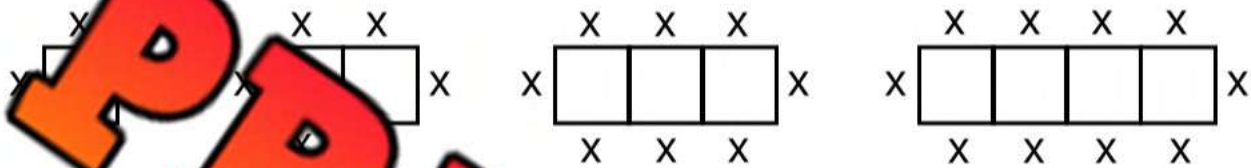
Picnic Word Problem – T-Tables

Challenge

Answer the word problem below. Use the T-Table to help.

You have been put in charge of organizing the end of the year banquet for your baseball team. You want to have as many seats as you can.

The diagram below shows how many people can sit at the tables.



a) Fill in the t-table below to learn the pattern of how many people can attend the banquet.

Tables	1	2	4	5
# of Seats				

b) Write an algebraic expression that represents the pattern.

c) How many people could you seat if you had...

i) 10 tables: _____

ii) 15 tables: _____

d) What if you didn't put the tables together? Would 8 tables together fit more or less than 8 tables apart?

Patterning – Growing Baby

Challenge

Answer the question below. Show your thinking!

A baby grows much faster than an adult. Babies can gain 3 grams of weight every hour!

- a) If a baby was born weighing 4000 grams, how much would it weigh after 5 days? Use a table of values.



- b) Write an algebraic expression that represents the weight of the baby after t days.

- c) How much would the baby weigh in kilograms after 10 days?
Remember, $1000\text{g} = 1\text{kg}$



Finding Term N – Word Problems

Word ProblemUse a table of values and find the n^{th} term

Colton has been saving money since he was 5 years old. He is now 15. He saved \$25 when he was 1, \$45 when he was 2, \$65 when he was 3 and \$85 when he was 4.

- a) Write a table of values to represent the situation.



- b) Write an algebraic expression that represents the function.

- c) How much will he save when he is 10?

- d) How much will he save when he is 20?

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Lucas collects art supplies and adds 4 new items to his collection every month. He started with 20 items.

- 1) Write an algebraic expression that represents the total number of art supplies Lucas will have after 2 years.
- 2) How many art supplies will Lucas have after 2 years?

Name: _____

Lucas collects art supplies and adds 4 new items to his collection every month. He started with 20 items.

- 1) Write an algebraic expression that represents the total number of art supplies.
- 2) How many art supplies will Lucas have after 2 years?

Name: _____

Lucas collects art supplies and adds 4 new items to his collection every month. He started with 20 items.

- 1) Write an algebraic expression that represents the total number of art supplies.
- 2) How many art supplies will Lucas have after 2 years?

Name: _____

Lucas collects art supplies and adds 4 new items to his collection every month. He started with 20 items.

- 1) Write an algebraic expression that represents the total number of art supplies.
- 2) How many art supplies will Lucas have after 2 years?

Task Cards: Patterning – All Operations

Objective

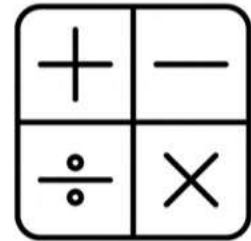
What are we learning about?

To recognize and create patterns using the four basic mathematical operations.

Materials

What you will need for the activity.

- 24 task cards
- Student recording sheet for answers
- Pen or pencil



Instructions

How you will run the activity

1. Introduce the concept of patterns in mathematics and their relevance to problem-solving in everyday life.
2. Organize the students into pairs and provide each pair with their sets of task cards.
3. Give each pair an answer recording sheet to record their answers.
4. Encourage teamwork by having students collaborate on their problem-solving solutions.
5. Allow students to select any task card to begin with, emphasizing that they can complete the cards in any order they prefer.
6. Instruct students to write their answer on the recording sheet.
7. Consider using a timer to create a dynamic challenge, adjusting the duration to fit the lesson's objectives and complexity.
8. After the activity, review the answers collectively, discussing any challenging patterns and strategies used to solve them.
9. Have students reflect on the activity, sharing the methods they applied and obstacles they overcame.

Task Cards

Cut out the task cards below

Card 1

Alex saves \$1 in week 1, \$2 in week 2, \$4 in week 3, and \$8 in week 4. How much will he save in week 7?

Card 2

A savings account starts with \$200. Each month, \$50 is deposited and \$10 is withdrawn. What will the balance be after 1 year?

Card 4

A train travels 80 km north each day. How far north will the train be after 5 days?

A movie theater has 50 seats in the first row, 55 in the second row, 60 in the third row. How many seats are there in the sixth row?

Card 5

The number of visitors to a park is 100 in the first week, 150 in the second week, 200 in the third week. How many visitors are expected in the 52nd week?

If a sequence starts at 1 and follows the pattern of adding 3, what is the 4th term?

Card 7

A tree is 1 meter tall. Each year, it grows 0.5 meters. How tall will the tree be in the 15th year?

Card 8

A worker earns \$100 per day but spends \$30 on transportation and food. How much will the worker save after 30 days?

Task Cards

Cut out the task cards below

Card 9

A sequence starts at 6 and is multiplied by 4 each term. What is the 4th term?

Card 10

A runner jogs 3 km on the first day, 6 km on the second day, 9 km on the third day. How many kilometers will the runner jog on the twelve day?

Card 12

An athlete runs 5 km on the first day, 10 km on the second day, 15 km on the third day. How many kilometers will the athlete run on the tenth day?

A plant grows 2 cm every day for a week, then doubles its growth rate every week. What is its growth on the fourth week?

Card 13

A factory produces 250 units but 50 are defective and removed each day. How many units will be produced in total after 15 days?

A swimmer swims 1 km in the morning and then 5 km in the evening. How many kilometers will the swimmer swim in 10 days?

Card 15

A gardener plants 12 seeds but 3 seeds do not sprout each week. How many seeds will sprout after 8 weeks?

Card 16

A sequence starts at 68 and decreases by 2, then by 4, then by 6. What is the value of the 7th term?

Task Cards

Cut out the task cards below

Card 17

Becky saved \$50 in January, \$75 in February, and \$100 in March. How much will she save in June?

Card 18

A pattern starts at 4 and doubles every month. What is the value of the pattern in the 5th month?

Card 20

A hiker starts at an altitude of 1000 meters. Each day, he climbs 30 meters and descends 20 meters. What is his altitude after 12 days?

Sarah collects 5 shells in the first week, 8 shells in the second week, and 11 shells in the third week. How many shells will she collect in the sixth week?

Card 21

A runner jogs 2 km on the first day, 4 km on the second day, and 8 km on the third day. How many kilometers will the runner jog on the seventh day?

A factory produces 100 widgets in the first hour, 90 widgets in the second hour, and 80 widgets in the third hour. How many widgets will be produced in the 6th hour?

Card 23

If a sequence starts at 5 and triples each time, what is the 4th term?

Card 24

A student completes 10 math problems but makes 2 mistakes each day. How many correct problems will the student complete in 25 days?

T-Tables – Finding Patterns

Instructions

Fill in the T-Tables by counting the lines in each figure

Algebraic Expression

Figure	Lines
1	7
2	
3	
5	

Algebraic Expression

Figure	Lines
1	
2	
3	
10	

Algebraic Expression

Figure	Lines
1	
2	
3	
10	

1) Figure 1 Figure 2 Figure 3

2) Figure 1 Figure 2 Figure 3

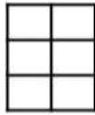
3) Figure 1 Figure 2 Figure 3

Growing Patterns

Instructions

How many blocks are in each term. Sketch the next 3 terms

1)

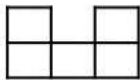
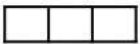


a) Represent the function using an algebraic expression:

b) How many blocks will the 10th term have?

c) How many blocks will the 30th term have?

2)



a) Represent the function using an algebraic expression:

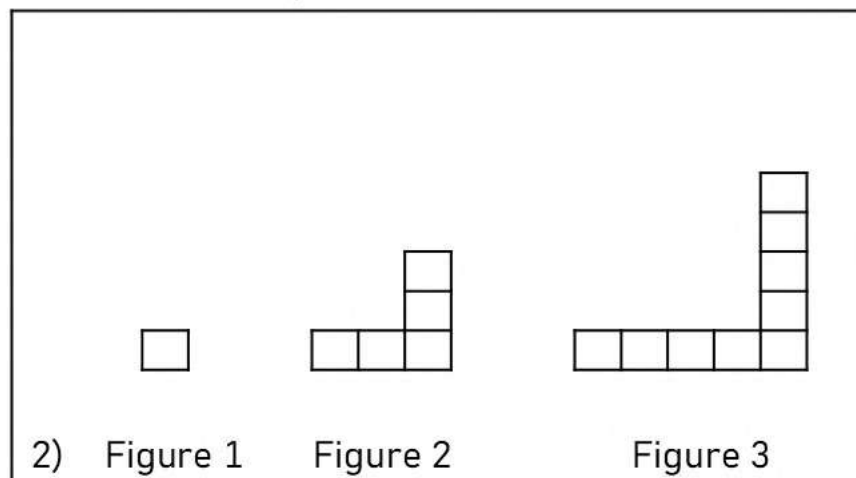
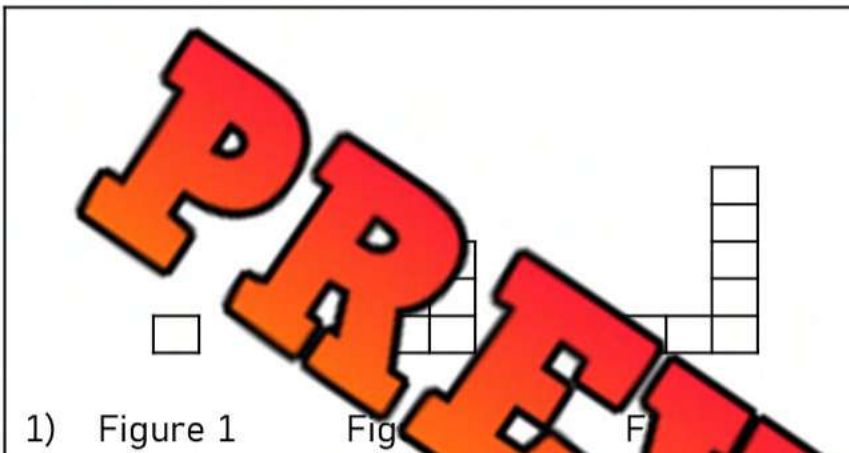
b) How many blocks will the 20th term have?

c) How many blocks will the 30th term have?

T-Tables – Finding Patterns

Instructions

Fill in the T-Tables by counting the lines in each figure



Algebraic Expression

Figure	Lines
1	
2	
3	
5	
8	
	94

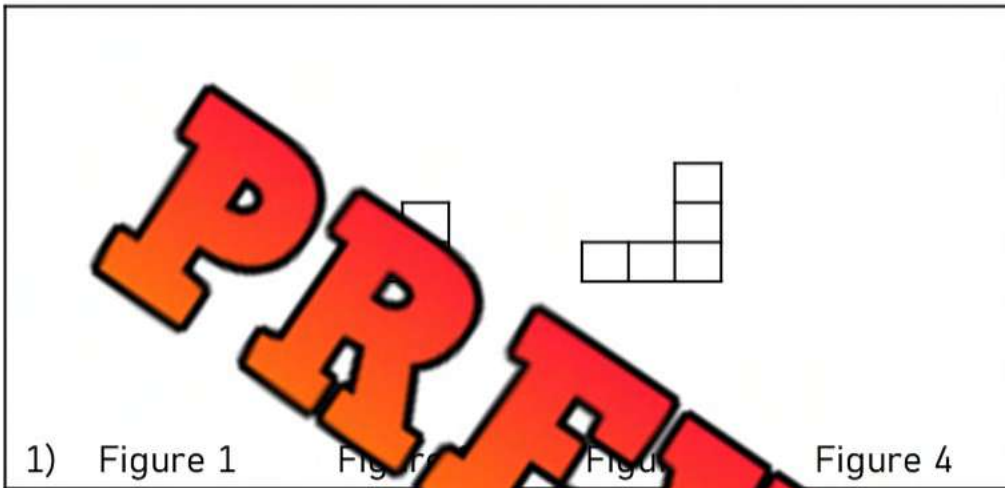
Algebraic Expression

Figure	Lines
1	
2	
3	
	52
	100
	112

T-Tables – Drawing Blocks

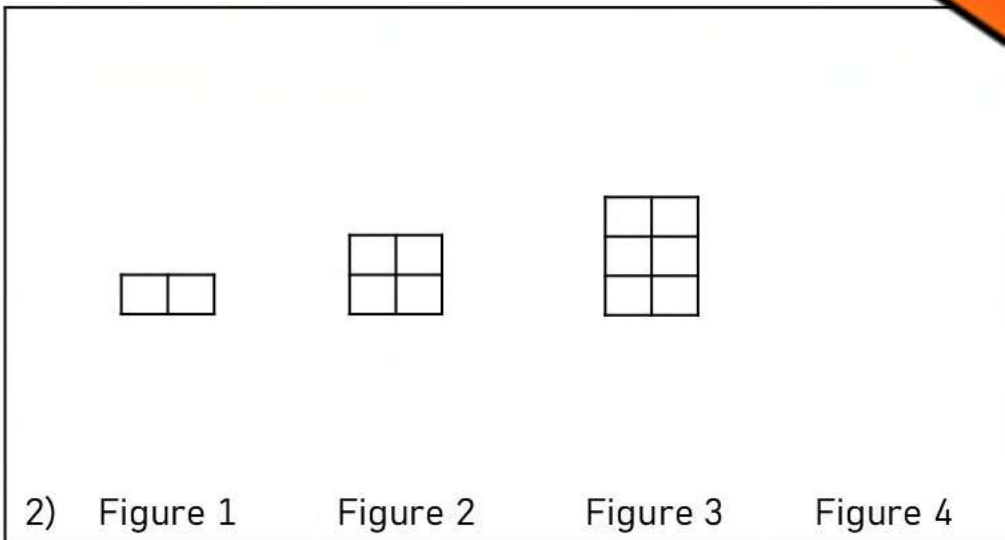
Instructions

Fill in the T-Tables and draw figure 4



Algebraic Expression

Figure	Lines
1	
2	
3	
4	
	46
	118



Algebraic Expression

Figure	Lines
1	
2	
3	
4	
	47
	77

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

a) Draw the next figure.



b) Write the algebraic expression:

c) Write the number of lines that represents the figure sequence.

Figure

1

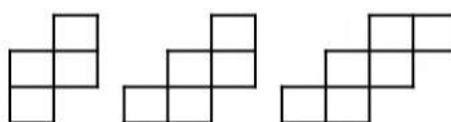
4

8

Lines

Name: _____

a) Draw the next figure.



b) Write the algebraic expression:

c) Write the number of lines that represents the figure sequence.

Figure

1

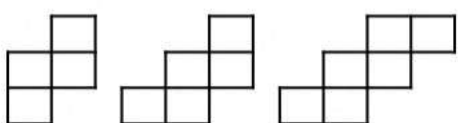
4

8

Lines

Name: _____

a) Draw the next figure.



b) Write the algebraic expression:

c) Write the number of lines that represents the figure sequence.

Figure

1

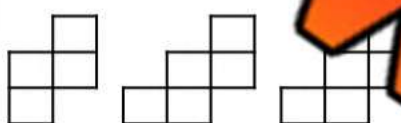
4

8

Lines

Name: _____

a) Draw the next figure.



b) Write the algebraic expression:

c) Write the number of lines that represents the figure sequence.

Figure

1

4

8

Lines

Basketball Skills Challenge

Instructions

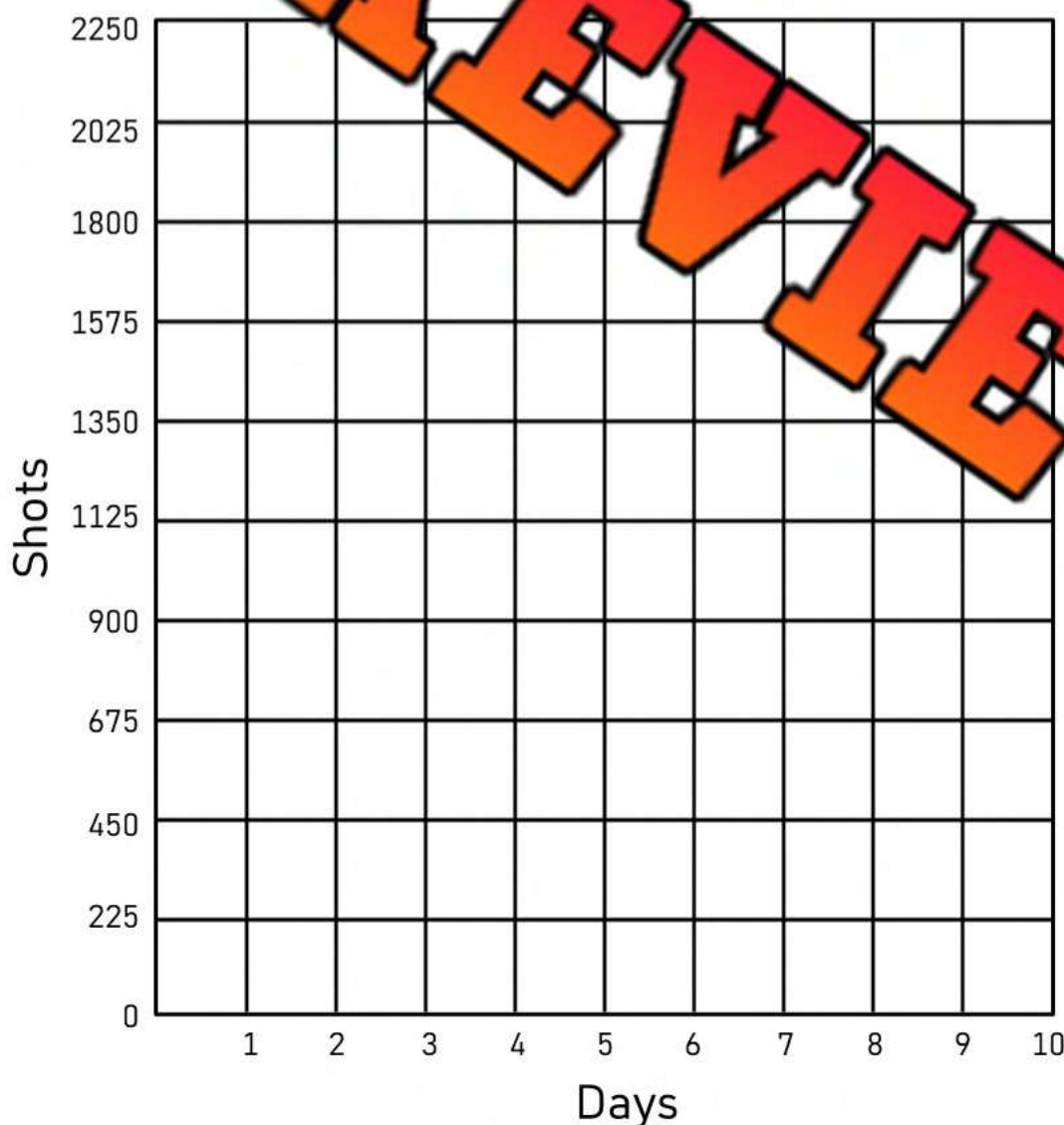
Complete the table of values and graph the results



Connor is practicing his shooting skills in basketball. He decides to take 225 shots each day for 10 days.

Term Number (Day)	1	2	3	4	5	6	7	8	9	10
Term Value (Shots)										

Function	Equation
----------	----------



Questions

1. Which day did Connor finish 1500 shots?

2. How many shots did Connor take in 7 days?

3. If his friend took 300 shots for 7 days, who would have taken more? Explain.

Saving Money

Instructions

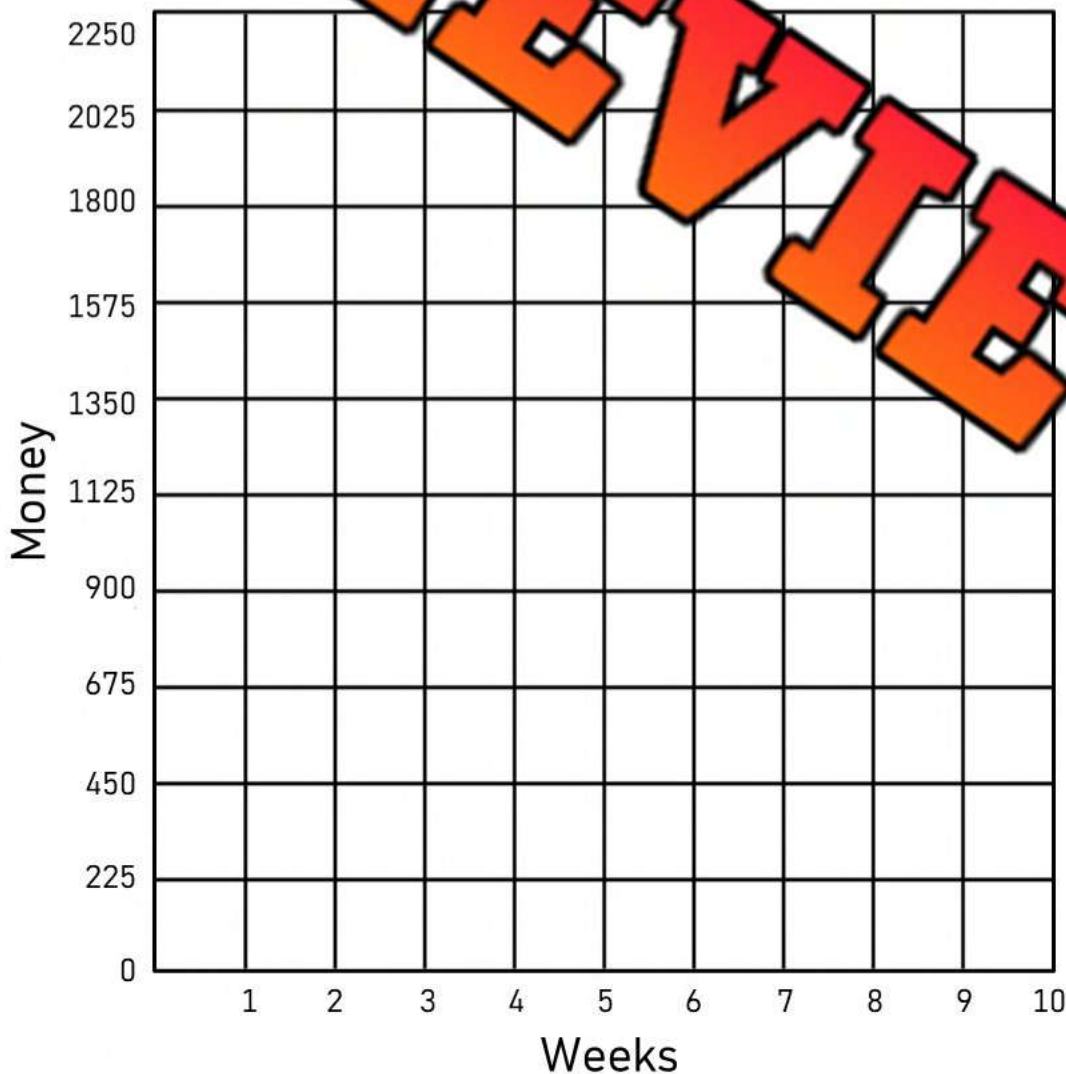
Complete the table of values and graph the results



Jesse is saving her pay cheques from work each week for 10 weeks. She makes \$450 each week. She is hoping she can buy a new bike for \$4 000. Fill in the table below to find out.

Term Number (Week)	1	2	3	4	5	6	7	8	9	10
Term										

Function	Algebraic Expression
----------	----------------------



Questions

1. Can Jesse buy her new bike after week 10?

2. How much did she have in 10

3. If she kept saving, how many weeks would she need to save \$6750.

4. How much money would she have after 13 weeks?

Patterning Word Problems - Blocks

Challenge

Answer the problems below

Matt is building a structure using blocks. The construction of his structure will be completed in 5 phases.

- a) Matt decided to add the same number of blocks during each of the 5 phases. He had different design ideas. Fill in the tables below.

Phases	Blocks
1	2
2	
3	
4	22
5	

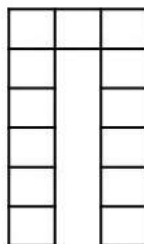
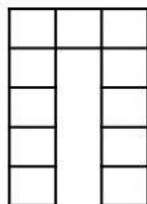
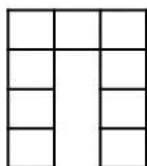
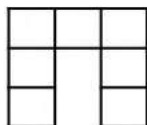
Phases	Blocks
1	
2	12
3	
4	
5	27

Phases	Blocks
1	8
2	
3	
4	
5	36

- b) Whoops, Matt made a mistake when he completed his table. His structure was supposed to add the same number of blocks during each phase. Find his error and correct it.

Phases	1	2	3	4	5
Blocks	12	17	21		

- c) You want to build a house out of blocks, but each block costs \$5. You have created 4 different design plans. You have \$70 to spend. Which design will you choose?



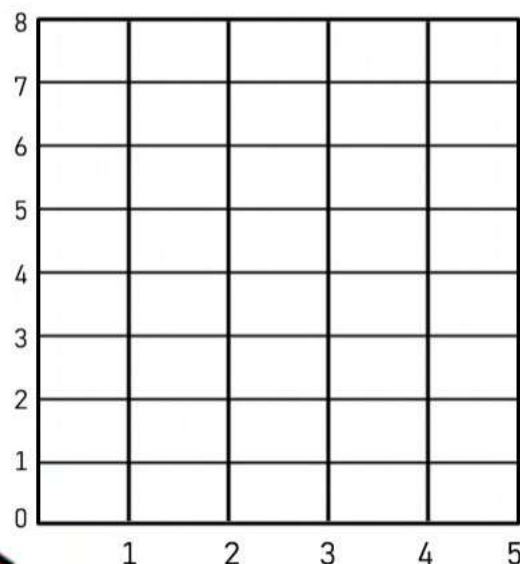
Design	Blocks	\$
1		
2		
3		
4		

Unit Test - Patterning

Part 1

Translate the increasing pattern into a table of values and a graph

Fill in the table of values and the graph by translating the growing pattern below.



Term Number	1	2	3	4	5	8
Term Value						

Pattern rule: _____

1) How many circles would term 20 have?

2) Which term number will use 100 circles?

3) Why is this graph a straight line?

Part 2

Write an algebraic expression that represents the function

Term Number	Term Value
1	4
2	5
3	6
4	7
5	

Term Number	Term Value
1	3
2	6
3	9
4	12
5	
20	

Term Number	Term Value
1	4
2	9
3	14
4	19
5	
50	

Part 3

Answer the questions about the pattern. Draw the 4th figure

Draw Figure 4



Figure 1

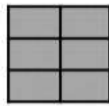


Figure 2

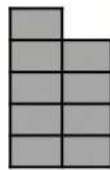


Figure 3

Figure 4

Figure	Term Value
1	
2	
3	
4	

1) What is the pattern rule? Start at _____, _____ each time.

2) How many rectangles would figure 25 have?

3) Write an expression that represents the pattern

Part 4

Answer the question below. Show your thinking!

Steven has \$20 in his bank account. He earns \$10 for every lawn he mows.

- a) How much money does he have after mowing one lawn?
- b) How much money does he have after mowing two lawns?



- c) Draw a table that represents the number of lawns he cuts and his earnings.

- d) Write an algebraic expression that represents the earnings.

- e) After cutting 20 lawns, how much money will Steven have?

- f) How much will he have after cutting 52 lawns?

Equation or Expression?

An **equation** is a mathematical sentence which states that one or more quantities are equal. Equations have an equal sign with values on both sides to show they are equal. An **expression** is a mathematical sentence that does not have an equal sign.

Equation = $3 + n = 21$ or $32 \div 4 = 8$

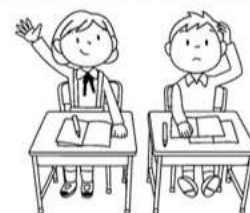
Expression = $3y + 2$ or $49 \div n$

Think _____ the number sentence an expression or an equation?



1) $25 + 10 = 35$ Expression Equation	2) $42 + y$ Expression Equation
3) $5y + 9$ Expression Equation	4) $1n + 5$ Expression Equation
5) $10 - 3 + n = 10$ Expression Equation	6) $7 + n$ Expression Equation
7) $12 \div 4 = 3$ Expression Equation	8) 64 Expression Equation
9) $100 \div n + 15$ Expression Equation	10) $\frac{25}{n} + 20 = 25$ Expression Equation
11) $\frac{40}{n} - 5$ Expression Equation	12) $67 + 3 - n \div 5$ Expression Equation

Equation or Expression?



Instructions Is the number sentence an expression or equation?

1) Paul has 20 cookies but needs 30 for his class. $20 + c = 30$	Equation	Expression
2) The parent is the following function: $3n - 1$	Equation	Expression
3) Maria wants to run 30 km in the week. She has already run 22km. $22 + 2 = 30$	Equation	Expression
4) The cost to enter an amusement park is \$5 per ticket. $25t$	Equation	Expression
5) Jeff works at a garden centre and earns \$18 an hour. He can figure out his pay by using the following. $18h$	Equation	Expression
6) Bailey made \$400 last week working with her mom. She worked 20 hours. $20w = 400$	Equation	Expression
7) Jane had 200 candies to give away on Halloween. She has 25 left. $200 - c = 25$	Equation	Expression
8) Ashley had 300 candies to give away on Halloween. She will give 3 candies to each kid. How many kids can she give candy to? $300 \div 3 = k$	Equation	Expression
9) Candy bags come in 20 packs. The total number of candies is represented below: $20b$	Equation	Expression

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Is the number sentence an expression or equation? Circle the answer

- 1) The function representing the growth of a population of rabbits is:
 $5n - 4$

Expression Equation

- 2) Sophie is halfway through reading a 300-page book. How many pages does she have left to read?

$$150 + p = 300$$

Expression Equation

Name: _____

Is the number sentence an expression or equation? Circle the answer

- 1) The function representing the growth of a population of rabbits is:
 $5n - 4$

Expression Equation

- 2) Sophie is halfway through reading a 300-page book. How many pages does she have left to read?

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Expression Equation

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 $5n - 4$

Expression Equation

- 2) Sophie is halfway through reading a 300-page book. How many pages does she have left to read?

$$150 + p = 300$$

Expression Equation

Writing Algebraic Expressions

Using algebraic expressions helps us understand mathematical situations. We can use a variable to replace a changing number, like how many tickets are sold to a game: $10t$



Part 1

Write each algebraic expression in words.
Use the words, "a number" in place of the variable

1) $9 - t$

Nine subtract a number

2) n

3) $6 + b$

4) $12r$

5) $\frac{y}{8} + 5$

Part 2

Write an algebraic expression for each situation

1) Twelve times a number subtract eight

2) Divide a number by seven and multiply it by a different number

3) A number is subtracted by fourteen divided by five

4) Triple a number subtracted by double a different number

5) Divide eighty by a number, then multiply by four

Algebraic Expression - Terms

An **expression** is simply numbers and at least one operation put together without an equal sign. For example, $8 + 2$ is an expression.

An **algebraic expression** is when we use a variable in an expression. The **variable** represents an unknown value. We use algebraic expressions to help us solve mathematical situations.

For example: if you were selling lemonade for \$2, you could use the following algebraic expression where the variable c represents cups sold: $2c$

In an algebraic expression, we have at least one term. A term could be a constant and/or a variable. It also include a coefficient.



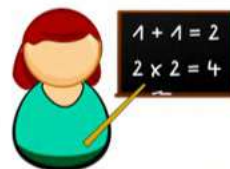
Terms	
Variable	An unknown value that is represented by a letter. We use a letter because the value could change.
Constant	A number on its own. It does not change and does not include any variables. Therefore, the number is constant.
Coefficient	A number used to multiply a variable.
Term	Is either a single number or a variable, or number and variable multiplied together.

Instructions

Answer the questions below about the expression provided

Expression	$5n - 3y - 8 + 4$
List the variables	
List the constants	
List the coefficients	
How many terms are there?	

Algebraic Expression - Terms



Part 1

Answer the questions below about the expression provided

Expression	$9 - 3n + 30t - (2y + 7x) - 5$
List the variables	
List the constants	
List the coefficients	
How many terms are there?	

Expression	$\frac{32}{n} + 7m + 125 + 3b - 75 + 2 \times 5$
List the variables	
List the constants	
List the coefficients	
How many terms are there?	

Part 2

Write your own expressions by following the instructions

1) Write an expression that has 4 terms, 3 coefficients, 3 variables, and 1 constant
2) Write an expression that has 5 terms, 3 coefficients, 4 variables, and 1 constant
3) Write an expression that has 6 terms, 2 coefficients, 3 variables, and 3 constants

Writing Algebraic Expressions - Treats

A mathematical expression is similar to an equation, but it does not have an equal sign. We use expressions to describe a mathematical situation.

Instructions

Write the expressions for the situations below

1) Lindsay has y amount of cookies. She gives 32 cookies away to the students in her class.

Expression:



2) Courtney cuts a brownies into b pieces. She eats 2 brownies.

Expression:



3) Alyse makes c cupcakes and shares them equally with her 4 friends.

Expression:



4) Hani gives 2 freezies to each of his f friends.

Expression:



5) Scott has 11 sodas in his fridge and buys s more sodas.

Expression:



6) Dan buys 2 dozen donuts and eats d number of donuts.

Expression:



7) Steve buys x number of cookies and gives 15 to his staff.

Expression:



8) Alexa has 35 suckers that she shares equally with her f number of friends.

Expression:



9) Brian has 200 gummy worms and takes n number of gummies from his brother.

Expression:



10) Howard gives 3 books each to s number of students.

Expression:



Finger Signals Quiz - Understanding Algebraic Expressions

Objective

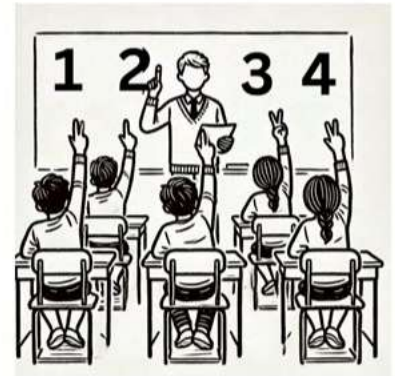
What are we learning about?

Students will reinforce their understanding of algebraic expressions through an interactive finger signals quiz.

Material

What you will need for the activity.

- A list of algebraic expressions



Instructions

How you will complete the activity

1. Prepare a list of questions with answers labeled A, B, C, and D.
2. Explain the finger signals for each answer choice: one finger for A, two fingers for B, three fingers for C, and four fingers for D.
3. Inform the students they will show their answer with the finger signal when you read each question.
4. Read the first question aloud clearly and repeat if necessary.
5. Give students a few moments to think about their answer and decide independently.
6. After a countdown (e.g., "3, 2, 1"), have all students show their answer simultaneously by raising the appropriate number of fingers.
7. Reveal the correct answer and explain why it is correct.
8. Repeat with different questions to reinforce understanding of algebraic expressions.

Name: _____

Question	A	B	C	D
A musician practices m hours each day for 7 days. What is the total practice time?	$7+m$	$7-m$	$7m$	$m \div 7$
A cyclist rides d kilometers per day for 5 days. What is the total distance?	$5+d$	$5-d$	$5d$	$d \div 5$
A library has b books and gives away 3. How many books are left?	$b+3$	$b-3$	$3b$	$b \div 3$
Mia collects s stamps every month. How many stamps does she collect in 3 months?	$3+s$	$3-s$	$3s$	$s \div 3$
Ben runs r miles every day for a week (7 days). What is the total distance?	$7+r$	$7-r$	$7r$	$r \div 7$
A factory produces p widgets every hour for 8 hours. How many widgets are produced in total?	$8+p$	$8-p$	$8p$	$p \div 8$
Lily has t toys and gives 4 to her friends. How many toys does she have left?	$t+4$	$t-4$	$4t$	$t \div 4$
David collects c coins every day. How many coins does he collect in 10 days?	$10+c$	$10-c$	$10c$	$c \div 10$
Olivia reads p pages every day. How many pages does she read in a week (7 days)?	$7+p$	$7-p$	$7p$	$p \div 7$
James has b balloons and gives 3 away. How many balloons are left?	$b+3$	$b-3$	$3b$	$b \div 3$
Emma writes p pages of her book each day for 5 days and then tears out 3 pages. How many pages are left?	$5p-3$	$5p+3$	$5p$	$5 \times p \div 3$
Alex has q quarters. He buys a toy that costs \$2 (8 quarters). How many quarters does he have left?	$q \div 8$	$q+8$	$q \times 8$	$q-8$
A pizza is cut into s slices. Tom eats 3 slices. How many slices are left?	$s+3$	$s-3$	$3s$	$s \div 3$
Kate has m marbles. She buys 7 more and then loses 2. How many marbles does she have now?	$m \times 7$	$m+2-7$	$m+7-2$	$m \div 2$
John has t toys. He gives 5 to his friend and then buys 3 more. How many toys does he have now?	$t-5+3$	$t+5-3$	$5t + 3$	$t \div 5 + 3$

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Write the expressions for the situations below

- 1) Emma collects c coins each day. She starts with 20 coins. Write an expression for the total number of coins she has after 4 days.

- 2) Jack has b books. He buys 5 books every month. Write an expression for the total number of books he has after 6 months.

Name: _____

Write the expressions for the situations below

- 1) Emma collects c coins each day. She starts with 20 coins. Write an expression for the total number of coins she has after 4 days.

- 2) Jack has b books. He buys 5 books every month. Write an expression for the total number of books he has after 6 months.

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Name: _____

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- 1) Emma collects c coins each day. She starts with 20 coins. Write an expression for the total number of coins she has after 4 days.

- 2) Jack has b books. He buys 5 books every month. Write an expression for the total number of books he has after 6 months.

Evaluating Algebraic Expressions

Part 1

Evaluate the following expressions for $x = 4$



1) $x + 16$	2) $10x$	3) $63 - x$	4) $x \div 2$
5) $16 \div x$	6) $12x$	7) $4x - x$	8) $12 \div x + 8$

Part 2

Evaluate the following expressions for $y = 7$ and $n = 5$

1) $y - n + 22$	2) $5n - y + n$	4) $y \div 7 + n$
5) $35 \div y + 5$	6) $11n - y$	7) $60 \div n + y$

Part 3

Evaluate the following expressions for $x = 9$ and $p = 3$

1) $x + p - 10$	2) $10x + (2p)$	3) $54 \div x - p$	4) $x + 9 + (3p)$
5) $18 \div x + (5p)$	6) $9x - (18 - p)$	7) $6x - 5p$	8) $8p + 3x$

Evaluating Algebraic Expressions

When solving an equation, you need to follow the order of operations. This means you have to solve the equation in the correct order, not just from left to right. Using BEDMAS helps us remember the order to solve.

1. Brackets 2. Exponents 3. Division or Multiplication (whichever is first) 4. Addition or Subtraction (whichever is first)

Example 1 $x = 2$

$$2 + (1 + 2)$$

$$2 + 3$$

$$2 + 3 = 5$$

$$24$$

Example 2 $y = 5$

$$y - (1 + 2)$$

$$5 - (1 + 2)$$

$$5 - 3$$

Example 3 $y = 3$

$$10 - 3 \times y$$

$$10 - 3 \times 3$$

$$10 - 9$$

$$1$$

Part 1

Evaluate the following expressions for $x = 4$

1) $x + 15 - 3$

2) $4 +$

3) $42 - 2x$

4) $4 \times 9 \div x$

5) $11x - (5 + 5)$

$x +$

Part 2

Evaluate the following expressions for $y = 6$

1) $y + 7 - 2 \times 5$

2) $6 + 7y - 4$

3) $100 - 2y \times 2$

Order of Operations – Who's Right?

Instructions

Ben and Dan both answered the questions below. Circle Who's right



	Question	Ben's Answer	Dan's Answer
1	$y = 3$ $2 + (y + 5)$	10	8
2	$y = 5$ $2 + 5y$	10	0
3	$y = 3$ $y + 3 \times$	15	11
4	$y = 6$ $3y + 5$	23	33
5	$y = 8$ $y - 4 \div 2$	2	
6	$y = 4$ $y + (8 - 3) \times 2$	14	18
7	$y = 7$ $y - 2 \times (5 - 2)$	1	15
8	$y = 20$ $100 \div (5 + y)$	40	4

Evaluating Algebraic Expressions

Part 1Evaluate the following expressions for $x = 4$

1) $x + 16$ _____	2) $10x$ _____	3) $63 - x$ _____	4) $x \div 2$ _____
5) $16 \div x$ _____	6) $12x$ _____	7) $4x - x$ _____	8) $12 \div x + 8$ _____

Part 2Evaluate the following expressions for $y = 7$ and $n = 5$

1) $y - n + 22$ _____	2) $78 - y + n$ _____	4) $y \div 7 + n$ _____
5) $35 \div y + 5$ _____	6) $11n - y$ _____	8) $60 \div n + y$ _____

Part 3Evaluate the following expressions for $x = 9$ and $p = 3$

1) $x + p - 10$ _____	2) $10x + (2p)$ _____	3) $54 \div x - p$ _____	4) $x + 9 + (3p)$ _____
5) $18 \div x + (5p)$ _____	6) $9x - (18 - p)$ _____	7) $6x - 5p$ _____	8) $8p + 3x$ _____

Writing Expressions

There are an endless number of expressions that represent the same number. For example, both of the expressions below equal 10

when $y = 5$			
Equation 1	$y + 5$	Equation 2	$4y - 10$

Part 1 Write four different expressions that represent the number 8. Use $y = 3$.

1)	2)
3)	

Part 2 Write four different expressions using more than one operation that represents the number 6. Use $y = 10$

1)	2)
3)	4)

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Write four different expressions using more than one operation that represent the number 12. Use $y = 8$

1) _____

2) _____

3) _____

4) _____

Name: _____

Write four different expressions using more than one operation that represent the number 12. Use $y = 8$

1) _____

2) _____

3) _____

4) _____

Name: _____

Write four different expressions using more than one operation that represent the number 12. Use $y = 8$

1) _____

2) _____

3) _____

4) _____

Name: _____

Write four different expressions using more than one operation that represent the number 12. Use $y = 8$

1) _____

2) _____

3) _____

4) _____

Name: _____

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Curriculum Connection
P6.3

Addition – Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal.

$8 + 4 = 12$

$23 + 15 \neq 36$

$47 + 13 = 50$

Instructions

Put a slash through the equal sign ($\neq$) if it is not balanced

1) $2 + 7 =$	2) $43 + 10 = 63$	3) $41 + 13 = 55$
4) $58 + 12 = 60$	5) $6 + 13 = 77$	6) $82 + 15 = 98$
7) $92 + 5 = 97$	8) $10 + 13 =$	9) $114 + 7 = 122$
10) $125 + 15 = 150$	11) $137 + 11 = 149$	12) $150 + 158$
13) $12 + 144 = 158$	14) $171 + 14 = 185$	15) $166 + 20 = 186$
16) $192 + 8 = 200$	17) $180 + 13 = 193$	18) $155 + 26 = 181$
19) $210 + 50 = 250$	20) $212 + 12 = 224$	21) $255 + 40 = 285$

Pre-Algebra – Balancing Addition Equations

Balancing equations means both sides of the equal sign must be the same.

Examples:

$$\begin{array}{c} 52 \\ \swarrow \searrow \\ 37 + 15 = \boxed{52} \end{array}$$

$$\begin{array}{c} 78 \\ \swarrow \searrow \\ 46 + 32 = \boxed{78} \end{array}$$

Instructions

Fill in the missing number to balance the equation

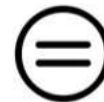
1) $44 + \boxed{} = \boxed{}$	2) $53 + 9 = \boxed{}$	3) $67 + 12 = \boxed{}$
4) $15 + \boxed{} = 30$	5) $48 + \boxed{} = 57$	6) $68 + \boxed{} = 81$
7) $\boxed{} + 12 = 95$	8) $\boxed{} + 25 = \boxed{} + 59 = 66$	
10) $72 + 14 = \boxed{}$	11) $64 + \boxed{} = 80$	12) $\boxed{} + 5 = 65$
13) $68 + \boxed{} = 82$	14) $83 + 15 = \boxed{}$	15) $89 + \boxed{} = 102$
16) $105 + \boxed{} = 116$	17) $121 + 14 = \boxed{}$	18) $145 + \boxed{} = 160$
19) $177 + \boxed{} = 198$	20) $215 + 41 = \boxed{}$	21) $217 + \boxed{} = 229$

Addition – Find the Variable

A **variable** is a letter that represents an unknown number. When we don't know a number, we can use a letter to take the place of the unknown number.

Example: $15 + n = 35$

We can figure out the unknown number by balancing the equation. In this equation, $n = 20$.



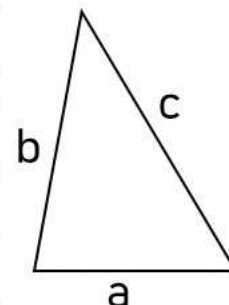
Part 1 Find out the value of the variable

$15 + n = 35$ $n =$	$n + 13 = 20$ $n =$	$27 + n = 35$ $n =$
$41 + p = 51$ $p =$	$36 + p = 51$ $p =$	$p + 48 = 79$ $p =$
$85 + y = 101$ $y =$	$190 + y = 205$ $y =$	$124 + 15 = y$ $y =$
$165 + t = 181$ $t =$	$190 + t = 205$ $t =$	$205 + t = 220$ $t =$
$231 + a = 245$ $a =$	$256 + a = 271$ $a =$	$271 + a = 285$ $a =$
$281 + 9 = s$ $s =$	$290 + n = 300$ $s =$	$s + 10 = 300$ $s =$

Part 2 The formula for calculating the perimeter of a shape is to add the side lengths

Find the perimeter with the measurements given for the 3 side lengths.

1) $a=4$ $b=7$ $c=10$	$P=$	4) $a=12$ $b=25$ $c=30$	$P=$
2) $a=7$ $b=12$ $c=16$	$P=$	5) $a=19$ $b=31$ $c=45$	$P=$
3) $a=9$ $b=17$ $c=23$	$P=$	6) $a=15$ $b=23$ $c=36$	$P=$



Activity – Math Hot Seat: Addition Challenge

Objective

What are we learning about?

Students will practice solving addition problems to find unknown values by participating in a fun and interactive game, enhancing their arithmetic skills and quick thinking.

$$X+10=25$$

Material

What you will need for the activity.

- Index cards with addition problems
- Chairs arranged in a circle
- Stopwatch
- Whiteboard and marker

Instructions

How you will complete the activity.

1. Prepare a stack of index cards with various addition problems. Ensure some problems require finding a missing number.
2. Arrange chairs in a circle with one "hot seat" in the center.
3. Explain the rules of the game to the students. One student will sit in the hot seat while the rest sit in the surrounding chairs.
4. The teacher will read an addition problem from the stack. The student in the hot seat has a limited time (e.g., 30 seconds) to solve the problem.
5. If the student in the hot seat answers correctly within the time limit, they stay in the hot seat for the next round. If they answer incorrectly or run out of time, they switch places with another student from the circle.
6. Continue the game until each student has had the opportunity to sit in the hot seat multiple times, or until the designated game time is up.
7. Keep track of the number of correct answers each student provides while in the hot seat. The student with the most correct answers at the end of the game wins.

Index Cards

Use the math problems below

$$4 + b = 22$$

$$15 + \underline{\quad} = 32$$

$$80 + k = 123$$

$$\underline{\quad} + 125 = 218$$

Sam has 5 apples and buys more apples so he has 26 apples. How many apples did he buy?

Jane has 5 candies and receives more from her friend, totaling 35 candies. How many did she receive?

$$75 + p = 149$$

$$150 + \underline{\quad} = 232$$

$$\underline{\quad} + a = 222$$

$$\underline{\quad} = 240$$

$$311 + \underline{\quad} = 56$$

$$14 + \underline{\quad} = 10$$

$$\underline{\quad} = 270$$

$$\underline{\quad} + 150 = 2$$

$$220 + h = \underline{\quad}$$

$$230 + \underline{\quad} = 250$$

Mike has 195 books and buys some more, ending up with 390 books. How many books did he buy?

Emma has 160 dolls and gets some more for her birthday, totaling 360 dolls. How many did she get?

Tim has 80 marbles and finds some more, ending up with 196 marbles. How many marbles did he find?

Ben has 190 pencils and buys some more to have 360 pencils. How many did he buy?

$$160 + g = 310$$

$$\underline{\quad} + 100 = 420$$

$$170 + z = 330$$

$$135 + \underline{\quad} = 210$$

Name: _____

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$$140 + u = 418$$

$$150 + \underline{\quad} = 328$$

$$o + 185 = 425$$

$$253 + n = 375$$

$$\underline{\quad} + 333 = 450$$

$$p + 228 = 325$$

Lucy has 80 crayons and gets more from her mom, totaling 130 crayons. How many did she get?

John has _____ toys and gets some more from his dad, ending up with 150 toys. How many toys did he get?

Anna has _____ balls and buys some more, so she has 312 balls in total. How many did she buy?

Paul has 270 markers and gets some more from school, ending up with 400 markers. How many markers did he get?

$$350 + \underline{\quad} = 87$$

$$55 + \underline{\quad} = 70$$

$$a + 470 = 515$$

$$350 + \underline{\quad} = 515$$

James has 250 keychains and gets some more from his dad, totaling 330 keychains. How many did he get?

Noah has 400 cards and buys some more, so he has _____ cards in total. How many did he buy?

Sarah has 50 stickers and gets some more, so she has 150 stickers in total. How many did she get?

Alex has 160 stamps and buys some more, ending up with 250 stamps. How many did he buy?

$$260 + k = 480$$

$$\underline{\quad} + 301 = 428$$

Jake has 190 coins and buys some more, so he has 319 coins in total. How many did he buy?

Tom has 170 erasers and finds some more, so he has 310 erasers in total. How many erasers did he find?

Mia has 140 ribbons and gets more from her friend, totaling 214 ribbons. How many did she get?

Using Variables to Solve Addition Equations

There are some instances where we know the values of variables and need to plug them into an equation. For example:

$$a + b + c = ?$$

$$7 + 9 + 11 = 27$$

$a = 7$

$b = 9$

$c = 11$



Instruct.

Solve the equations

$a + b + c = 10 \quad c = 8$

$_____ + _____ = _____$

$n + y + t = \quad n = 6 \quad y = 14 \quad t = 8$

$_____ + _____ + _____ = _____$

$c + r + p = \quad c = 9 \quad r = 8$

$_____ + _____ + _____ = _____$

$g + h + k = \quad g = 15 \quad h = 9 \quad k = 7$

$_____ + _____ + _____ = _____$

$e + c + g = \quad e = 9 \quad c = 6 \quad g = 14$

$_____ + _____ + _____ = _____$

$a + b + c = \quad a = 15 \quad b = 15 \quad c = 8$

$_____ + _____ + _____ = _____$

$a + b + c = \quad a = 14 \quad b = 12 \quad c = 11$

$_____ + _____ + _____ = _____$

$n + y + t = \quad n = \quad t = 12$

$_____ + _____ + _____ = _____$

$c + r + p = \quad c = 19 \quad r = 10 \quad p = 8$

$_____ + _____ + _____ = _____$

$g + h + k = \quad g = 25 \quad h = 20 \quad k = 15$

$_____ + _____ + _____ = _____$

$e + c + g = \quad e = 30 \quad c = 13 \quad g = 17$

$_____ + _____ + _____ = _____$

$a + b + c = \quad a = 22 \quad b = 31 \quad c = 21$

$_____ + _____ + _____ = _____$

Adding Decimals – Solve the Variable

Practice

Find the value of the variables below

1) $3.5 + n = 5$ $n =$	2) $n + 2.5 = 5$ $n =$	3) $s + 3.7 = 4$ $s =$
4) $14.7 + n = p$ $n =$	5) $8.2 + p = 10$ $p =$	6) $9.1 + r = 10.5$ $r =$
7) $14.7 + n = 16.5$ $n =$	8) $n + 16.5 = 18.5$ $n =$	9) $t + 11.4 = 15$ $t =$
10) $22.2 + n = 23.1$ $n =$	11) $16 + t = 21$ $t =$	12) $31.6 + 5 = p$ $p =$
13) $42.6 + n = 44.1$ $n =$	14) $52.8 + 6.2 = n$ $n =$	15) $63.4 + s = 68.5$ $s =$
16) $77.5 + s = 81.5$ $s =$	17) $85.4 + 2.2 = s$ $s =$	18) $18 + n = 20$ $n =$

Word Problem

Solve the questions below

- Jake has 2.5 pizzas left over from last night. His friend brings over some more pizza. They now have 4.5 pizzas. How much pizza did his friend bring?
- Kelly is 1.2 meters tall. She hopes to grow to be 1.7 metres tall. How much will she have to grow?

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Solve the questions below.

Chloe has a rope that is 9.6 meters long. She attaches a small rope to it. It is now 13.3 metres long. How long was the small rope?

Name: _____

Solve the questions below.

Chloe has a rope that is 9.6 meters long. She attaches a small rope to it. It is now 13.3 metres long. How long was the small rope?

Name: _____

Solve the questions below.

Chloe has a rope that is 9.6 meters long. She attaches a small rope to it. It is now 13.3 metres long. How long was the small rope?

Name: _____

Solve the question

Chloe has a rope that is 9.6 meters long. She attaches a small rope to it. It is now 13.3 metres long. How long was the small rope?

Equation Pairs - Addition

When we add numbers or variables (letters) together, we can change the order of the numbers/letters without affecting the answer. This is called the **commutative property**.

Directions: Isaac works at a fast-food truck. He sells burgers (b) and fries (f). His job is to calculate how much the customer owes in total (t) for their order.

Instructions: Write 2 equations for the orders below



#	Fries (f)	Burger (b)	Equation 1 (f + b = t)	Equation 2 (b + f = t)
1	3	8	$3 + 8 = 11$	$8 + 3 = 11$
2	5			
3	3	6		
4	7	8		
5	5	9		
6	7	6		
7	3	4		
8	5	7		
9	7	9		
10	5	8		

Addition Equations – Perimeter of a Rectangle

When we calculate the perimeter of a rectangle, we need to add all the sides together. The order of how we decide to add the sides together will not affect the answer due to the commutative property of addition.

Formula 1: $p = a + b + a + b$

$$p = 12 + 4 + 12 + 4$$

$$p = 32$$

$a = 12\text{cm}$



$b = 4\text{cm}$

Formula 2

$$p = 2(a + b)$$

$$p = 2 \times (12 + 4) = 32$$

Part 1 Using two equations for the side lengths below

#	Side length A	Side Length B	Equation 1	Equation 2
1	7			
2	5			
3	9			
4	11	8		
5	13	16		
6	20	17		
7	17	11		
8	22	14		
9	19	22		
10	27	14		

Part 2 Using multiplication and addition, write two equations for the side lengths

#	Side length A	Side Length B	Equation 1	Equation 2
1	7	3	$2(7 + 3) = 20$	$2(3 + 7) = 20$
2	5	4		
3	9	5		
4	6	8		

Writing Addition Equations – Candy Shop

Alice works at a candy shop. She sells suckers (s), gum (g), and chocolate bars (b). Her job is to calculate how much their order costs (c).

Instructions

Write the equation and find the answer



#	Customers Order (\$)	Equation	Answer
1	$g = 5$ $s = 9$	$c = g + b + s$ $c = 5 + 8 + 9$	22
2	$g =$ $b =$		
3	$g = 7$ $s = 15$		
4	$g = 9$ $b = 8$ $s = 5$		
5	$b = 15$ $s = 12$		
6	$g = 31$ $b = 16$		
7	$g = 24$ $b = 18$ $s = 16$		
8	$g = 38$ $s = 24$		

Word Problems – Writing Addition Equations

Instructions

Answer the questions below

1) Alex and Ryan had 37 points together in a basketball game. Ryan had 21 points. Which equation will tell us how many points Alex had?

$a + 21 = 37$	$37 + 21 = a$
$21 + a = 37$	$21 - a = 37$



2) Bruce and Hank made \$75 together at work. Bruce can't remember how much he made but Hank says he made \$39. Which equation will tell us how much Bruce made?

$b + 39 = 75$	$39 + b = 75$
$39 + b = 75$	$75 + 39 = b$



3) Mary and Brianna found 121 Easter eggs together. Mary found 65. Which equation will tell us how many Brianna found?



$121 + b = 65$	$65 + b = 121$
$b + 65 = 121$	$121 + b = 65$

4) Brad scored 38 points in a basketball game. He had 12 points in the second half. Which equation will tell us how many points he had in the first half?

$p + 38 = 12$	$38 + 12 = p$
$38 + p = 12$	$12 + p = 38$



5) It snowed 31cm in two days. The first day it snowed 14cm. Which equation will tell us how much it snowed the second day?



$s + 14 = 31$	$31 + 14 = s$
$14 + s = 31$	$31 + s = 14$

Word Problems – Solving Addition Equations

Questions

Write the algebraic equations and answer the question

1) Luna drove 321km to get to a friend's house and then they drove to the mall. When they got to the mall, she had driven 418 km in total. How many km did she drive to the mall (m)?



2) Carter got 150 points for beating level 1 in a video game. He got 238 more points in level 2. How many total points (t) did he have after level 2?

Bonus – He had 50 total points for beating level 3. How many points did he get in level 3 (L)?



3) The Lakers scored 122 total points in a game against the Toronto Raptors. Kobe Bryant had 81 points for the Lakers. How many points (p) did the rest of the team have?



4) Wyatt's boat can hold 500 litres of gas. He went out boating for 6 hours. When he docked the boat after he was done, the tank had 128 litres of gas left. How many litres (L) did he use?



5) Leo had \$736 in his bank account. He deposited some more money after gardening for a summer. Now he has \$980. How much money (m) did he make gardening?



Math Basketball: Addition Equations Challenge

Objective

What are we learning about?

To reinforce students' understanding and application of addition through engaging word problems and a fun basketball shooting game.



Materials

What you will need for the activity.

- Small ball (e.g., tennis ball)
- Trash can or hoop to serve as the hoop
- Index cards with addition word problems
- Marker or pen
- Timer or stopwatch

Instructions

How you will complete the activity.

1. Divide the class into two teams (or more depending on preference).
2. Prepare a stack of index cards with addition word problems. Arrange the students so they are seated in two groups, with the trash can placed at a reasonable shooting distance.
3. Explain the rules: The teacher will read a word problem. The first team to raise their hand gets to answer.
4. If the team answers correctly, they earn a point and get a chance to shoot the ball into the trash can for an extra point.
5. If they make the basket, they earn an extra point for their team. If they miss, no extra point is awarded.
6. Alternate turns between the teams, ensuring that each student gets a chance to answer and shoot.
7. Continue the game until all word problems have been answered or the designated game time is up.
8. Tally the points to determine the winning team.
9. Conclude by discussing the strategies used to solve the word problems and reinforcing the concept of addition.

Name: _____

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Index Cards

Use the following table for the game.

Maria has 24 apples in total. She picked 10 apples from one tree and 8 apples from another. How many apples did she pick from the third tree (a)?

Jason collected 50 marbles in total. He found 20 marbles in the park and 15 marbles at home. How many marbles did he find at school (m)?

Emily read 74 pages of her book in total. She read 40 pages on Monday and 30 pages on Tuesday. How many pages did she read on Wednesday (p)?

Daniel has 60 toy cars in total. He received 20 toy cars for his birthday and 25 toy cars from his friends. How many toy cars did he already have (c)?

Sarah saw 71 birds in the park. She saw 20 sparrows and 15 robins. How many pigeons did she see (b)?

Liam built 105 Lego structures in total. He built 30 houses and 40 cars. How many towers did he build (t)?

Olivia has 28 books. She has 10 novels and 8 comic books. How many picture books does she have (p)?

Noah drew 77 pictures in total. He drew 30 landscapes and 22 pictures of animals. How many animal pictures did he draw (a)?

Ava has 33 school supplies. She has 15 pencils and 12 pens. How many erasers does she have (e)?

James collected 200 stamps in total. He collected 123 stamps from his travels and 50 stamps from friends. How many stamps did he buy (s)?

Mia baked 80 cookies. She baked 33 chocolate chip cookies and 25 oatmeal cookies. How many sugar cookies did she bake (c)?

Ethan has 150 toy soldiers in total. He has 75 green soldiers and 54 red soldiers. How many blue soldiers does he have (b)?

Name: _____

85

Index Cards

Use the following table for the game.

Emma has 43 stickers in total. She received 15 stickers from her friend and 10 stickers from her teacher. How many stickers did she already have (s)?

Lucas collected 115 seashells in total. He found 40 seashells on the beach and 35 seashells in the sand. How many seashells did he find in the water (w)?

Sophia built 50 sandcastles in total. She built 27 sandcastles on Monday and 25 sandcastles on Tuesday. How many sandcastles did she build on Wednesday (s)?

Jack has 32 toy trains in total. He got 13 toy trains for Christmas and 9 toy trains for his birthday. How many toy trains did he already have (t)?

Ella saw 65 animals at the zoo. She saw 23 monkeys and 19 lions. How many giraffes did she see (a)?

Ryan has 90 blocks. He has 30 red blocks and 42 blue blocks. How many green blocks does he have (b)?

Lily has 57 crayons. She has 20 red crayons and 15 blue crayons. How many yellow crayons does she have (c)?

Oliver drew 80 pictures in total. He drew 37 animals and 15 cars. How many houses did he draw (h)?

Chloe has 47 balloons. She has 18 red balloons and 15 blue balloons. How many yellow balloons does she have (b)?

Mason collected 120 baseball cards in total. He got 53 cards from his dad and 48 cards from his friend. How many cards did he already have (c)?

Grace read 154 pages in total. She read 68 pages in the morning and 52 pages in the afternoon. How many pages did she read at night (p)?

Benjamin has 77 cars. He has 22 toy cars and 25 model cars. How many remote control cars does he have (r)?

Subtraction – Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal

$16 - 8 = 8$

$95 - 11 \neq 86$

$105 - 12 = 93$

InstructionsPut a slash through the equal sign ($\neq$) if it is not balanced

1) $5 - 6 = 1$	2) $46 - 4 = 42$	3) $57 - 6 = 51$
4) $68 - 10 = 57$	5) $6 - 1 = 57$	6) $75 - 13 = 63$
7) $84 - 14 = 70$	8) $92 - 16 = 76$	9) $108 - 12 = 95$
10) $135 - 15 = 110$	11) $126 - 20 = 109$	12) $138 - 14 = 124$
13) $168 - 22 = 144$	14) $174 - 13 = 161$	15) $157 - 16 = 142$
16) $189 - 0 = 0$	17) $192 - 11 = 180$	18) $181 - 15 = 166$
19) $195 - 30 = 165$	20) $197 - 16 = 182$	21) $171 - 26 = 155$

Subtraction – Find the Variable

A **variable** is a letter that represents an unknown number. When we don't know a number, we can use a letter to take the place of the unknown number.

Example: $39 - n = 25$

We can figure out the unknown number by balancing the equation. In this equation, $n = 14$.



Part 1 Find out the value of the variable

1) $46 - n = 17$ $n =$	2) $n - 15 = 20$ $n =$	3) $47 - n = 35$ $n =$
4) $68 - 16 = p$ $p =$	5) $74 - p = 53$ $p =$	6) $p - 16 = 50$ $p =$
7) $76 - y = 61$ $y =$	8) $74 - y = 0$ $y =$	9) $92 - 13 = y$ $y =$
10) $105 - t = 91$ $t =$	11) $114 - t = 1$ $t =$	12) $131 - t = 119$ $t =$
13) $153 - a = 137$ $a =$	14) $168 - a = 145$ $a =$	15) $172 - a = 159$ $a =$

Part 2 Calculate the change a customer gets when they buy something

When a customer buys something, the formula for calculating their change (c) is money given (m) subtract the price (p) of the item. Therefore, $c = m - p$

$m = 20$ $p = 15$	$c = 20 - 15$	$c = 5$	$m = 60$ $p = 51$	$c = \underline{\quad} - \underline{\quad}$	$c =$
$m = 30$ $p = 19$	$c = \underline{\quad} - \underline{\quad}$	$c =$	$m = 100$ $p = 77$	$c = \underline{\quad} - \underline{\quad}$	$c =$
$m = 50$ $p = 27$	$c = \underline{\quad} - \underline{\quad}$	$c =$	$m = 100$ $p = 61$	$c = \underline{\quad} - \underline{\quad}$	$c =$

Subtracting Decimals – Solve the Variable

Practice

Find the value of the variables below



1) $6.5 - n = 3$ $n =$	2) $n - 2.5 = 4$ $n =$	3) $s - 3.2 = 2$ $s =$
4) $\quad = p$	5) $9.1 - p = 7$ $p =$	6) $12.1 - r = 10.5$ $r =$
7) $16.3 - \quad = n$	8) $n - 3.5 = 11.5$ $n =$	9) $t - 4.4 = 15$ $t =$
10) $22.7 - n = 20.1$ $n =$	11) $\quad = t$	12) $34.6 - 6 = p$ $p =$
13) $47.6 - n = 44.4$ $n =$	14) $58.8 - \quad = 1.4$ $n =$	15) $67.2 - s = 62.4$ $s =$
16) $75.5 - s = 71.4$ $s =$	17) $88.4 - 2.3 = s$ $s =$	18) $\quad = n$

Word Problem

Solve the questions below

- 1) Zara has 1.5 birthday cakes leftover from her party. She eats some the next morning and now there is only 0.9 of the cake left. How much did she eat?
- 2) Randy works for 7.5 hours today. He only has 2 hours left to work. How much time has elapsed?

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Solve the questions below.

Noah had _____ of flour. He now has 3.4 kg after baking bread. How much flour did he use?

Name: _____

Solve the questions below.

Noah had 8.9 kg of flour. He now has 3.4 kg after baking bread. How much flour did he use?

Name: _____

Solve the questions below.

Noah had 8.9 kg of flour. He now has 3.4 kg after baking bread. How much flour did he use?

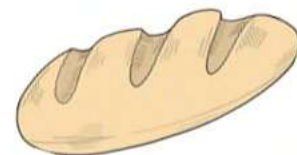
Name: _____

Solve the question

Noah had 8.9 kg of flour. He now has 3.4 kg after baking bread. How much flour did he use?

Writing Subtraction Equations - Bakery

Alice works at a bakery. Her job is to provide change (c) to customers when they pay for their baked goods (g). She must subtract their order from their payment (p).



Instructions

Write the equations and find the answer

#	Payment (p)	Baked Goods (g)	Equation	Answer
1	50	32	$c = p - g$ $c = 50 - 32$	c = 18
2	80	45	_____	
3	100	72	_____	
4	120	103	_____	
5	100	86	_____	
6	150	94	_____	
7	200	118	_____	
8	150	137	_____	

Word Problems – Writing Subtraction Equations

Questions

Answer the questions below

1) Harry bought 24 donuts. Him and a friend ate 9 of them. Which equation will tell us how many donuts there are left?

$$d - 9 = 24$$

$$24 - 9 = d$$

$$d - 24 = 9$$

$$24 - d = 9$$



2) Sarah is doing a running challenge. She needs to run 42km in 5 days. It is the last day and she has 8km left to run. Which equation will tell us how many km she has run in the last day?



$$42 - r = 8$$

$$8 - r = 42$$

$$42 - 8 = r$$

$$r - 8 = 42$$

3) Tom collected 142 shells on the beach. He gave some to his sister. Now he has 94 shells left. Which equation tells us how many shells Tom gave to his sister?

$$142 - 94 = s$$

$$142 - s = 94$$

$$s - 94 = 142$$

$$s - 94 = 142$$



4) Courtney saved 125 dollars to buy new shoes. She now has 45 dollars left. Which equation tells us how much the shoes cost?



$$s - 45 = 125$$

$$125 - 45 = s$$

$$45 + s = 125$$

$$125 - s = 45$$

5) The movie is 118 minutes long. They have watched 31 minutes. Which equation tells us how many minutes are left?

$$m - 31 = 118$$

$$118 - 31 = m$$

$$31 + m = 118$$

$$31 - m = 118$$



Word Problems – Solving Subtraction Equations

Instructions

Write the equation using the variable and then solve the equation

1) Sofia started the weekend with \$421 in her bank account. She went shopping (s) at the mall and now has \$76. How much did she spend at the mall?



2) Cheryl is running in a race. She has run 2931m already. How many metres does she have left (e) to finish the race?



3) Michael is driving to an amusement park today. The park is 573km away. He will need to stop for gas at the 350km mark. How many km will he have left (L) after he stops?



4) Jacob is climbing Mount Everest to Base Camp. It is 5,464m high. He took a break with 1,650m left. How many metres has he climbed (c) already?



5) Willow is driving to her cottage in northern Saskatchewan. The total distance is 801km. She has driven 427km already. How much more distance (d) does she need to drive?



Solving Subtraction Equations - Vacation

Questions

Solve the problems below. The first one is done for you

1) Ron is driving 1,350km (x) to a resort with his family. They drive 415km on the first (f) day and 480km on the second (s) day. How many km do they have left (L)?

Equation : $L = x - f - s$ or $x - f - s = L$

$L = 1350 - 415 - 480$

$L = 455$ Therefore, Ron and his family have 455km remaining to drive.



2) The family decides to budget \$400 on dinner out for 3 nights. They spent \$95 on the first (f) dinner, and \$100 on the second (s) dinner. How much do they have left for the third dinner (t)?

Equation : _____



3) The family heads to the waterslide park. They bring \$100 in total (t). The two adults (a) cost \$48 each. The two kids (k) cost \$25 each. How much do they have left (L)?

Equation : _____



4) The family buys a 50 pack of gummies (g). Ron (r) has 6 and his sister (s) has 8. The kids (k) eat 26 together. How many gummies are left (L)?

Equation : _____



5) On the drive home, they take a short cut. The drive is 981km (d). They drive 311km the first day (f) and 511km the second (s) day. How many km do they have left (L)?

Equation : _____



Math Activity Title: Algebraic Bottle Flip Challenge**Objective**

What are we learning about?

To practice and reinforce understanding of basic one-step and two-step subtraction algebra problems through the engaging and physically active bottle flip game.

**Materials**

What you will need for the activity.

- 1 bottle (or cup) (pair/group) filled to approximately one-third with water
- Set of subtraction algebra question cards
- Answer sheet for each group

Instructions

How you complete the activity

1. Start with a short lesson on one-step subtraction algebra problems, using examples like $x - 3 = 4$.
2. Arrange the students into pairs or small groups and give each group a bottle and a set of question cards to each.
3. Each pair or group receives an answer sheet to record their answers.
4. Explain the rules: One student draws a question card and solves the subtraction algebra problem.
5. Once they believe they have the correct answer, they write it on the answer sheet.
6. The student then gets to attempt a bottle flip. After answering each question, the student gets only one flip. After they flip their bottle, they should keep track of successful flips and unsuccessful flips.
7. Alternate turns within each group or pair until they have completed all the question cards.
8. Groups or pairs tally their successful flips and compare with the rest of the class to determine the winning team (team with the most successful flips/correct answers). For incorrect answers, deduct a point from their successful bottle flips.
9. Go through the answer sheet with the class to ensure understanding and correct any misconceptions.
10. Discuss the strategies used to solve the subtraction problems and how this type of algebra is used in real-life situations.

Questions

Cut out the questions below and use for the game

$x - 15 = 85$	$b - 20 = 50$	$200 - d - 10 = 162$	$190 - 30 - 54 = w$
$122 - g = 75$	$b - 33 = 67$	$180 - 25 - k = 110$	$e - 144 - 30 = 82$
$150 - 10 = p$	$150 - c = 100$	$170 - j - 30 = 98$	$193 - t - 40 = 122$
Dylan had 150 candies and gave away some. Now he has 55. How many did he give away?	Eva had 93 crayons and gave away some. Now she has 34. How many did she give away?	Sarah had 210 stickers, she gave 52 to one friend and 36 to another. How many stickers does she have left?	Sara set aside \$400 for school supplies. She spent \$90 on notebooks, \$125 on textbooks, and some amount on art supplies. She has \$125 left for pens and pencils. How much did she spend on art supplies?
Max had 158 marbles and lost some. Now he has 92. How many did he lose?	Ben had 187 pencils and gave some to his friends. Now he has 139. How many did he give away?	Jane had 100 books. She sold 25 and donated 86. How many books does she have left?	Emma saved \$515 for a vacation. She spent \$285 on a flight, \$110 on accommodation, and some amount on food. She has \$55 left. How much did she spend on food?
Lily had 139 stickers and used some. Now she has 91. How many did she use?	Charlie had 183 toys and gave some to charity. Now he has 126. How many did he give away?	Mike had 255 coins, he spent 71 and lost 53. How many coins does he have left?	Jack set aside \$625 for a new computer. He spent \$312 on the computer, \$126 on accessories, and some amount on software. He has \$55 left. How much did he spend on software?

Name: _____

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Algebraic Bottle Flip Challenge

Answers

Record your answers below

1	
2	
4	
5	
6	
7	
8	
9	
10	
11	
12	

13	
14	
15	
16	
19	
20	
21	
22	
23	
24	

Multiplication – Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal.

$6 \times 3 \neq 16$

$3 \times 8 = 24$

$7 \times 6 \neq 49$

InstructionsPut a slash through the equal sign ($\neq$) if it is not balanced

1) $5 \times 4 = 20$	2) $5 \times 4 = 25$	3) $8 \times 3 = 21$
4) $7 \times 5 = 35$	5) $6 \times 3 = 18$	6) $7 \times 4 = 21$
7) $10 \times 3 = 30$	8) $6 \times 5 = 40$	9) $9 \times 4 = 38$
10) $9 \times 10 = 90$	11) $2 \times 7 = 16$	12) $10 \times 8 = 80$
13) $6 \times 4 = 24$	14) $6 \times 6 = 42$	15) $5 \times 9 = 40$
16) $6 \times 7 = 42$	17) $4 \times 9 = 36$	18) $3 \times 10 = 30$
19) $8 \times 7 = 57$	20) $7 \times 7 = 49$	21) $8 \times 4 = 31$

Pre-Algebra – Balancing Multiplication Equations

Balancing equations means both sides of the equal sign must be the same.

Examples:

$$\begin{array}{c} 24 \\ \wedge \\ 8 \times 3 = 24 \end{array}$$

$$\begin{array}{c} 42 \\ \wedge \\ 7 \times 6 = 42 \end{array}$$

Instructions

Fill in the missing number to balance the equation

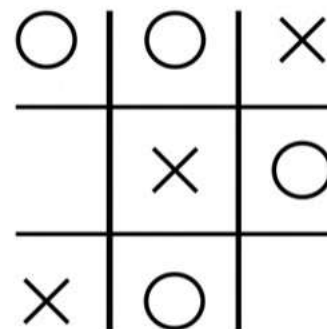
1) $6 \times \square =$	2) $5 \times 7 = \square$	3) $4 \times 5 = \square$
4) $8 \times \square = 16$	5) $\square \times 9 = 18$	6) $4 \times \square = 28$
7) $\square \times 5 = 25$	8) $\square \times 6 =$	9) $\square \times 3 = 18$
10) $9 \times 4 = \square$	11) $7 \times \square = 56$	12) $\square \times 5 = 40$
13) $3 \times \square = 33$	14) $10 \times 9 = \square$	15) $6 \times \square = 54$
16) $8 \times \square = 48$	17) $20 \times 3 = \square$	18) $4 \times \square = 44$
19) $12 \times \square = 48$	20) $14 \times 4 = \square$	21) $11 \times \square = 110$

Math Tic-Tac-Toe: Solving Variables

Objective

What are we learning about?

To help students practice solving multiplication equations involving variables in a fun and interactive way through a Tic-Tac-Toe game.



Materials

What will you need for the activity?

- Tic-Tac-Toe boards

Instructions

How you will complete the activity

1. Find a partner to play the game with.
2. The goal is to solve the algebraic equations in each square and place your marker (X or O).
3. One player will be "X" and the other will be "O".
4. Take turns choosing a square and solving the equation in that square and the value of the variable.
5. Write down the solution below the equation and place your marker (X or O) in the square.
6. If a player chooses a square and solves the equation incorrectly, they do not get to place their marker in that square. The other player gets a chance to solve it correctly and place their marker.
7. The first player to get three markers in a row (horizontally, vertically, or diagonally) wins the game. Continue playing with different tic-tac-toe grids on the sheet.

Tic-Tac-Toe

Use the following tic-tac-toe grids for the game.

$4p = 32$	$6 \times 10 = q$	$5n = 20$
$8s = 48$	$3 \times 9 = g$	$7k = 56$
$9q = 81$	$4 \times 16 = t$	$10r = 80$

$3p = 24$	$7 \times 9 = x$	$6m = 18$
$5t = 25$	$4 \times 10 = e$	$8n = 48$
$2k = 16$	$9 \times 7 = l$	$10b = 60$

$5p = 35$	$6 \times 12 = w$	$4n = 20$
$8s = 64$	$3 \times 14 = z$	$4m = 36$
$9r = 63$	$2 \times 15 = f$	$10a = 30$

$7p = 28$	$5 \times 9 = m$	$6m = 30$
$9s = 81$	$4 \times 12 = c$	$8n = 72$
$2z = 12$	$3 \times 11 = v$	$10r = 100$

$4p = 16$	$6 \times 11 = h$	$5n = 15$
$8s = 56$	$3 \times 8 = l$	$7k = 49$
$9q = 72$	$2 \times 14 = d$	$10b = 90$

$3p = 27$	$7 \times 10 = r$	$6m = 24$
$5t = 50$	$4 \times 13 = b$	$8n = 40$
$2k = 18$	$9 \times 6 = y$	$10r = 70$

Tic-Tac-Toe

Use the following tic-tac-toe grids for the game.

$5p + 3 = 43$	$6 \times 9 = g$	$7n - 5 = 16$
$8s = 64$	$3 \times 12 = f$	$4m = 28$
$9r + 6 =$	$\times 15 = x$	$10a - 1 = 19$

$7p + 9 = 44$	$5 \times 8 = w$	$6m + 6 = 42$
$9s = 63$	$4 \times 11 = c$	$8n = 56$
$2t - 7 = 7$	$3 \times 14 = z$	$10b - 8 = 72$

$4p + 7 = 35$	$6 \times$	$l =$
$8s = 72$	$3 \times 10 = m$	$7k = 4$
$9q + 8 = 62$	$2 \times 16 = v$	$10r - 8 = 82$

$3p + 2 = 23$	$7 \times 11 = q$	$6m - 15 = 3$
$5t =$	$4 \times 9 = j$	$8n = 64$
$2k - 1 =$	$9 \times 8 =$	$10a + 9 = 79$

$2p + 27 = 41$	$5 \times 10 = d$	$7n - 15 = 34$
$9s = 81$	$3 \times 13 = e$	$4m = 32$
$8r - 8 = 32$	$6 \times 7 = y$	$6b + 14 = 86$

$6p - 15 = 15$	$4 \times 12 =$	$9s + 8 = 35$
$5k = 25$	$3 \times 14 = r$	$7m = 21$
$8q - 13 = 51$	$2 \times 15 = b$	$10a + 11 = 61$

Equation Pairs – Area of a Rectangle - Multiplication

Liam believes you can find the area of a rectangle in two different ways. Can you write the two equations you could use to solve the area of a rectangle?

Remember – $a = l \times w$



3cm

7cm

Option 1

$$a = 7 \times 3$$

$$a = 21\text{cm}^2$$

Option 2

$$a = 3 \times 7$$

$$a = 21\text{cm}^2$$

Instructions Write two equations that represent the area of a rectangle

#	Length	Width	Equation 1	Equation 2
1	7m	3m		
2	5cm	4cm		
3	9km	6km		
4	10cm	8cm		
5	7m	4m		
6	9m	5m		
7	6cm	12cm		
8	8km	11km		
9	4cm	9cm		
10	7m	6m		

Writing Multiplication Equations – Lottery Tickets

Amelia is selling lottery tickets for \$15 a ticket. She needs to calculate how much money her customers owe her for her tickets.



Part 1

Use a multiplication equation to fill in the table

#	# of Tickets (t)	Equation
1	6	
2		
3		
4	8	
5	7	

Part 2

Amelia sells tickets to two different people in the same transaction

#	# of Tickets Person 1	# of Tickets Person 2	Equation
1	5	3	$15 \times 5 = 75$ $15 \times 3 = 45$ $75 + 45 = 120$
2	4	7	
3	9	2	
4	2	5	
5	6	6	
6	12	3	
7	8	11	
8	10	10	

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Solve the questions below.

a) Jason sells bags of buns at his bakery. Each bag has 6 buns. Write a multiplication expression that represents his sales.

b) Jason sells 4 packs of buns and 8 packs of buns in the same transaction. Write the equation.

Name: _____

Solve the questions below.

a) Jason sells bags of buns at his bakery. Each bag has 6 buns. Write a multiplication expression that represents his sales.

b) Jason sells 4 packs of buns and 8 packs of buns in the same transaction. Write the equation.

Name: _____

Solve the questions below.

a) Jason sells bags of buns at his bakery. Each bag has 6 buns. Write a multiplication expression that represents his sales.

b) Jason sells 4 packs of buns and 8 packs of buns in the same transaction. Write the equation.

Name: _____

Solve the questions below.

a) Jason sells bags of buns at his bakery. Each bag has 6 buns. Write a multiplication expression that represents his sales.

b) Jason sells 4 packs of buns and 8 packs of buns in the same transaction. Write the equation.

Using Variables to Solve Multiplication Equations

There are some instances where we know the values of variables and need to plug them into an equation. For example:

$$ab = c$$

$$a = 6$$

$$b = 8$$

$$6 \times 8 = c$$

$$c = 48$$



Instructions Find out the value of the variable

$ab = c$ $a = 4$ _____ x _____ = c $c =$	$en = f$ $e = 3$ $n = 6$ _____ x _____ = f $f =$
$ry = p$ $r = 5$ $y = 4$ _____ x _____ = p $p =$	$th = g$ $t = 3$ $g = 7$ _____ x _____ = h $h =$
$ab = c$ $a = 6$ $b = 8$ _____ x _____ = c $c =$	$en = f$ $e = 3$ $n = 8$ _____ x _____ = f $f =$
$ry = k$ $r = 4$ $y = 9$ _____ x _____ = k $k =$	$tg = h$ $t = 3$ $g = 4$ _____ x _____ = h $h =$
$ab = c$ $a = 6$ $b = 7$ _____ x _____ = c $c =$	$en = f$ $e = 3$ $n = 8$ _____ x _____ = f $f =$
$ry = p$ $r = 4$ $y = 12$ _____ x _____ = p $p =$	$tg = h$ $t = 11$ $g = 4$ _____ x _____ = h $h =$

Multiplying Decimals – Solve the Variable

Practice

Find the value of the variables below

1) $1.5n = 3$ $n =$	2) $n \times 2.5 = 5$ $n =$	3) $s \times 2.2 = 6.6$ $s =$
4) $2 = p$ $p =$	5) $5.3p = 15.9$ $p =$	6) $12.1r = 48.4$ $r =$
7) $1.3n =$ $n =$	8) $n \times 3.5 = 17.5$ $n =$	9) $t \times 4.4 = 22$ $t =$
10) $6.7n = 20.1$ $n =$	11) $ = t$ $p =$	12) $3.4 \times 2 = p$ $p =$
13) $7.6n = 38$ $n =$	14) $.5n = 45$ $n =$	15) $10.1s = 50.5$ $s =$
16) $7.5s = 45$ $s =$	17) $4.2 \times 3 = s$ $s =$	18) $ \times 4 = n$

Word Problem

Solve the questions below

- 1) Rylan has grown 32.5cm since she was born. She grew 6.5cm each year. How many years has she been alive?
- 2) It rained 3.3mm every hour. In total, it rained 26.4mm. How many hours did it rain?



Activity: Multiplication Race

Objective

What are we learning about?

Students will practice multiplication algebra questions by racing to solve equations quickly and accurately.

Materials

What you will need for the activity.

- Index cards
- Markers or pens
- Timer (optional)



Instructions

How to play the activity

1. Prepare a stack of index cards with multiplication and one-step algebraic equation questions. Include a mix of problems for variety.
2. Have students line up in a single file.
3. Call the first two students in line to the front to play a multiplication race to answer the multiplication algebraic equation question that the teacher pulls from the stack.
4. Pull a card from the stack and read the question aloud.
5. The first student to answer correctly wins the round. If a student says the wrong answer, they are out and go to the end of the line.
6. The student who answers correctly stays at the front to compete against the next student in line.
7. The student who loses goes to the end of the line.
8. Optional: If a student wins five rounds in a row, they move to the back of the line to give others a chance to play.
9. Continue the game until all students have had a chance to compete multiple times or until the designated game time is up.

Name: _____

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Curriculum Connection
P6.3

Multiplication Equations

Use these for the race

$5x = 25$

$4y = 16$

$3z = 9$

$2.5a = 10$

$7b = 49$

$0.5c = 1$

$1.5x = 4.5$

$6y = 36$

$1.5z = 6$

$8x = 40$

$4y = 16.5$

$2c = 20$

$10x = 50$

$3y = 21$

$6z = 18$

$4x = 12$

$2.2y = 1$

$1.5c = 9$

$1.5x = 7.5$

$9y = 27$

$1.5c = 9$

$5x = 45$

$7.5y = 22.5$

$3.5c = 7$

$2x = 10$

$6.5y = 32.5$

$8z = 32$

$0.6x = 3$

$5.2y = 36.4$

$2.5z = 15$

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Solve the questions below.

Emma saved \$11.50. She saves \$5.50 every week. How many weeks did it take her to save this amount?

Name: _____

Solve the questions below.

Emma saved \$60.50. She saves \$5.50 every week. How many weeks did it take her to save this amount?

Name: _____

Solve the questions below.

Emma saved \$60.50. She saves \$5.50 every week. How many weeks did it take her to save this amount?

Name: _____

Solve the question

Emma saved \$60.50. She saves \$5.50 every week. How many weeks did it take her to save this amount?

Solving Multiplication Equations

Questions

Solve the problems below. The first one is done for you

1) The Mighty Bears play 3 games (g) a week for 7 weeks (w). How many games in total did they play (p)?

Equation : $p = g \times w$ or $g \times w = p$

$p = 3 \times 7$

$p = 21$ Therefore, the Mighty Bears played 21 games in total.



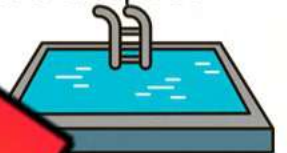
2) John picked 6 apples (a) from each tree at an apple orchard. He picked 72 apples in total (p). How many trees (t) did he pick apples from?

Equation : _____



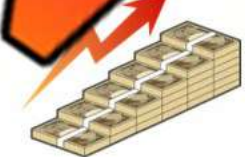
3) Kai puts 8 small chlorine pucks (p) in his pool each week. He went through 96 total (t) chlorine pucks last summer. How many weeks (w) did he have the pool running last summer?

Equation : _____



4) Isaiah invests (i) 225 each week for 10 weeks (w). How much money (m) does he have invested after 10 weeks?

Equation : _____



5) Ivy paid (p) \$525 for her lawn to be cut for the summer. She was charged \$25 per time (t). How many times was her lawn cut (c)?

Equation : _____



Therefore, _____

Matching Game: Do The Variables Match

Objective

What are we learning about?

To enhance students' understanding of equality within addition, subtraction, and multiplication equations. Students will identify and match pairs of equations that yield the same result, fostering critical thinking and problem-solving skills in a collaborative group setting.

Materials

What will you need for the activity.

- Pre-prepared pre-constructed cards.
- Small bags or envelopes to hold the cards for each group

Instructions

How you will complete the activity

1. Preparation: Before the class, the teacher will create the pre-prepared matching game cards. Each card will have an equation with a variable to solve for.
2. Setup: Divide the students into small groups and give each group a bag or envelope containing a set of the matching cards.
3. Gameplay: In their groups, students will spread out the cards face down on their table. Each person takes a turn to try to match two cards. They will need to solve both equations to see if they match (equal the same value for the variable). If they find a correct match, they keep the cards out and continue with their next turn. If the cards don't match, they turn them back over in the same place, and the next player takes a turn.
4. The activity continues until all pairs are correctly matched within each group.



Name: _____

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Curriculum Connection
P6.3

Cards

Matching Game Cards

$$2x + 4 = 20$$

$$5x = 40$$

$$3 + 11$$

$$15 - n = 7$$

$$5p = 25$$

$$5p + 10 = 25$$

$$18 - r = 2$$

$$r + 8 = 14$$

$$8 + a = 14$$

$$2a + 2 = 14$$

Cards

Matching Game Cards

$$7c = 21$$

$$3c + 6 = 15$$

$$m - 12 = 12$$

$$20 - m = 12$$

$$4y + 2 = 18$$

$$2y - 6 = 14$$

$$6 + z = 14$$

$$3z = 2$$

$$9b - 3 = 24$$

$$5b = 15$$

Cards

Matching Game Cards

$$5 + k = 17$$

$$20 - k = 8$$

$$3h + 7 = 21$$

$$2h + 3 = 21$$

$$4 + q = 16$$

$$q + 9 = 21$$

$$2w + 3 = 13$$

$$w + 7 = 12$$

$$10 - t = 3$$

$$2t + 1 = 15$$

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Cards

Matching Game Cards

$$6d - 2 = 16$$

$$d + 8 = 11$$

$$3f - 2 = 22$$

$$7v + 1 = 29$$

$$v + 8 = 12$$

$$5 + u = 11$$

$$3u - 2 = 16$$

$$3 + g = 18$$

$$2g + 1 = 31$$

PREVIEW

Division – Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal.

$8 \div 2 \neq 5$

$9 \div 3 = 3$

$15 \div 3 \neq 3$

InstructionsPut a slash through the equal sign ($\neq$) if it is not balanced

1) $16 \div 4 = 4$	2) $25 \div 5 = 4$	3) $32 \div 4 = 8$
4) $36 \div 6 = 6$	5) $9 \div 3 = 3$	6) $28 \div 4 = 8$
7) $50 \div 5 = 10$	8) $48 \div 4 = 12$	9) $36 \div 4 = 8$
10) $99 \div 11 = 10$	11) $35 \div 7 = 5$	12) $42 \div 6 = 7$
13) $24 \div 4 = 8$	14) $49 \div 7 = 6$	15) $45 \div 9 = 5$
16) $72 \div 8 = 8$	17) $81 \div 9 = 9$	18) $36 \div 3 = 12$
19) $56 \div 7 = 9$	20) $48 \div 12 = 3$	21) $63 \div 9 = 7$

Pre-Algebra – Balancing Division Equations

Balancing equations means both sides of the equal sign must be the same.

Examples

$$\begin{array}{c} 5 \\ \wedge \\ 25 \div 5 = \boxed{5} \end{array}$$

$$\begin{array}{c} 6 \\ \wedge \\ 18 \div \boxed{3} = 6 \end{array}$$

Instructions

Fill in the missing number to balance the equation

1) $36 \div \boxed{} = \boxed{}$	2) $35 \div 7 = \boxed{}$	3) $20 \div 5 = \boxed{}$
4) $24 \div \boxed{} = 8$	5) $8 \div \boxed{} = 3$	6) $35 \div \boxed{} = 7$
7) $\boxed{} \div 5 = 4$	8) $\boxed{} \div 6 = \boxed{}$	9) $\boxed{} \div 3 = 9$
10) $36 \div 4 = \boxed{}$	11) $56 \div \boxed{} = 8$	12) $63 \div \boxed{} = 7$
13) $24 \div \boxed{} = 3$	14) $99 \div 9 = \boxed{}$	15) $64 \div \boxed{} = 8$
16) $48 \div \boxed{} = 6$	17) $20 \div 4 = \boxed{}$	18) $48 \div \boxed{} = 12$
19) $49 \div \boxed{} = 7$	20) $36 \div 3 = \boxed{}$	21) $72 \div 6 = \boxed{}$

Division – Find the Variable

A **variable** is a letter that represents an unknown number. When we don't know a number, we can use a letter to take the place of the unknown number.

Example: $27 \div n = 3$

We can figure out the unknown number by balancing the equation: $n = 9$.

Part 1

Find out the value of the variable.

1) $18 \div n = 3$ $n =$	2) $n \div 9 = 3$ $n =$	3) $s \div 5 = 3$ $s =$
4) $24 \div p = 6$ $p =$	5) $24 \div p = 6$ $p =$	6) $48 \div r = 8$ $r =$
7) $36 \div n = 6$ $n =$	8) $72 \div n = 8$ $n =$	9) $t \div 11 = 5$ $t =$
10) $90 \div n = 9$ $n =$	11) $72 \div 8 = t$ $t =$	12) $81 \div 9 = p$ $p =$
13) $64 \div n = 8$ $n =$	14) $77 \div n = 11$ $n =$	15) $99 \div s = 11$ $s =$
16) $48 \div s = 4$ $s =$	17) $42 \div 7 = s$ $s =$	18) $72 \div s = 9$ $s =$

Part 2

Solve the question below.

Servers at a restaurant share tips (t) equally at the end of the day. The number of people that share the tips depends on how many servers (s) were working. We can use a formula to find out how much money (m) each server takes home: $m = t \div s$

t = 150 s = 5	m = $150 \div 5$	m = 30
t = 180 s = 3	m = $\div$	m =
t = 250 s = 5	m = $\div$	m =

t = 120 s = 3	m = $\div$	m =
t = 210 s = 7	m = $\div$	m =
t = 320 s = 4	m = $\div$	m =

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: _____

Solve the questions below.

Workers at a construction site share their daily earnings (e) equally at the end of the day. The number of workers that share the earnings depends on how many workers (w) were working. We can use a formula to find out how much money (m) each worker takes home: $s = e \div w$

e = 300 w = 6	s = $\div$	s =
e = 480 w = 8	s = $\div$	s =
e = 360 w = 4	s = $\div$	s =

Name: _____

Solve the questions below.

Workers at a construction site share their daily earnings (e) equally at the end of the day. The number of workers that share the earnings depends on how many workers (w) were working. We can use a formula to find out how much money (m) each worker takes home: $s = e \div w$

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Name: _____

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e = 300 w = 6	s = $\div$	s =
e = 480 w = 8	s = $\div$	s =
e = 360 w = 4	s = $\div$	s =

Name: _____

Solve the questions below.

Workers at a construction site share their daily earnings (e) equally at the end of the day. The number of workers that share the earnings depends on how many workers (w) were working. We can use a formula to find out how much money (m) each worker takes home: $s = e \div w$

e = 300 w = 6	s = $\div$	s =
e = 480 w = 8	s = $\div$	s =
e = 360 w = 4	s = $\div$	s =

Writing Division Equations - Sharing

Riley is the best boss! Every week, she brings in treats for her staff to share. Each week, there are different treats and a different number of staff members working at the office.



Instructions

Use a formula to find out how many treats (t) each person gets

#		# of Staff (s)	Formula	Answer
1	16 donuts (d)	8	$d \div s = t$	$16 \div 8 = 2$
2	12 cookies (c)	5	$c \div s = t$	
3	20 muffins (m)	5		
4	16 slices of pizza (p)	4		
5	10 bagels (b)	10		
6	15 donuts (d)	5		
7	24 cookies (c)	8		
8	18 muffins (m)	6		
9	28 pastries (p)	4		
10	32 cookies (c)	8		
11	36 slices of pizza (p)	9		
12	24 bagels (b)	3		
13	25 muffins (m)	5		

Algebra Jeopardy

Objective

What are we learning about?

To reinforce students' understanding of basic algebraic concepts and their application to solve simple equations and word problems in a fun and competitive game for

Materials

What you will need for the activity.

- Jeopardy board and questions
- Buzzer or bell



Instructions

How you will complete the activity

1. Print the Jeopardy board on the next page.
2. Divide the class into two teams.
3. Ask one team to go first by selecting a point value.
4. Read the question aloud from the point value.
5. The first team to ring the bell or buzzer gets to answer.
6. If they answer correctly, award them the points. If not, another team can answer.
7. Continue the game until all questions have been answered.
8. Tally the points to determine the winning team.
9. Conclude by discussing what they learned about the topic in the questions.

Name: _____

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Jeopardy Questions

Ask students the questions below

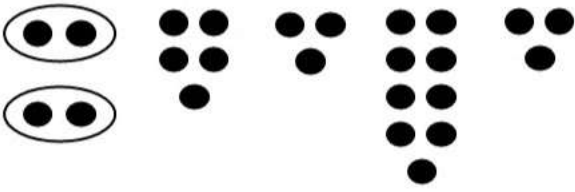
\$100	\$200	\$300	\$400	\$500
$45 \div n = 5$	$1.5x = 7.5$	$4x - 5 = 15$. Find x.	If 5 apples cost \$20, what is the cost of one apple?	Sarah is 4 years older than twice her sister's age. If Sarah is 28, how old is her sister?
$n \div 6 = 8$	$n + 7 = 35$	$24 = 3x + 18$. Find x.	If 3 muffins cost \$18, how much does each muffin cost?	Tom has 3 times as many books as Jerry. Together they have 44 books. How many books does each have?
$n \div 4 + 3 = 13$	$12n + 10.5$	$n = 51$.	Sarah bought 3 books for \$15. How much did each book cost?	Sarah has 5 times as many marbles as Ben. Together they have 42 marbles. How many marbles does each have?
$74 - p = 53$	$8.2 + p = 10$	$21n + 7 = 51$. Solve for n?	John bought 4 pens for \$3 and a ruler for \$2. How much did the pens cost?	A triangle's perimeter is 30 cm. One side is twice the other, and the third side is 6 cm. Find the length of the sides.
$85 + y = 101$	Ryan has 90 blocks. He has 38 red blocks and 42 blue blocks. How many green blocks does he have (b)?	$12r - 4 = 32$. What is r?	If a book costs \$8 and a notebook costs \$12, and you buy two of each, what is the total cost?	Two pieces of rope are 5 times as long as the other. Together, they are 72 meters long. How long is each piece?
$5 = x - 3$. What is x?	$2x + 3 = 13$. Find x.	$4x - 5 = 15$. Find x.	A box contains 32 candies. You eat 2 and then decide to give 6 to each friend, how many friends can you give candies to?	In a garden, the number of roses is 2 times the number of tulips. If there are 45 flowers in total, how many roses and tulips are there?

Equivalent Forms of an Equation

When we add or subtract the same amount from both sides of an equal sign, the equation does not change. Investigate this theory below.

Instructions

Draw circles to represent the equations

#	Original Equation	Change	New Equation
1	$2n + 5 = 9$ 	Add 3	$2n + 5 + 3 = 9 + 3$ 
2	$5 + n$		
3	$12 - n = 7$	Add 3	
4	$3n + 4 = 13$	Subtract 5	
5	$3 + 4n = 15$	Add 7	

Equivalent Forms of an Equation

Instructions

Write four equivalent forms of the equations below

#	Original Equation
1	$4n = 20$
	Add 6 to each side
	Subtract 2 from each side
	Multiply each side by 2
	Divide each side by 4

#	Original Equation
2	$3x - 8 = 2$
	Add 8 to each side
	Subtract 13 from each side
	Multiply each side by 3
	Divide each side by 6

#	Original Equation
3	$5n - 5 = 25$
	Add 50 to each side
	Subtract 20 from each side
	Multiply each side by 4
	Divide each side by 5

Equivalent Forms of an Equation

When we change an equation by adding, subtracting, multiplying, and dividing the same amount from both sides, does the equation change? Investigate below!

Instructions

Fill in the table below

#	Original Equation	Change	New Equation
1	$5n = 20$ $n =$	Add 10 to each side	$5n + 10 = 20 + 10$ $n = 4$
2	$8 - n = 15$ $n =$	Add 7 to each side	
3	$15 + n = 2$ $n =$	Subtract 2 from each side	
4	$6n = 12$ $n =$	Multiply each side by 3	
5	$2n = 16$ $n =$	Divide each side by 2	
6	$52 - n = 34$ $n =$	Subtract 15 from each side	
7	$68 + n = 85$ $n =$	Add 13 to each side	
8	$5n = 50$ $n =$	Multiply each side by 4	
9	$3n = 27$ $n =$	Divide each side by 3	

Unit Test - Algebra

Part 1

Calculate the value of the variable

$9 + n = 15$ $n =$	$124 + 15 = y$ $y =$	$p + 48 = 79$ $p =$
$97 - y = 12$ $y =$	$76 - y = 61$ $y =$	$p - 16 = 50$ $p =$
$3n = 27$ $n =$	$\frac{36}{n} = 12$ $n =$	$6s = 48$ $s =$

Part 2

Solve the equation

$a + b + c = d$ $a = 9$ $b = 10$ $c = 8$ $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = d$ $d =$	$t + h = g$ $t = 12$ $g = 6$ $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = g$ $h =$
$r \div y = t$ $r = 28$ $y = 7$ $\underline{\hspace{1cm}} \div \underline{\hspace{1cm}} = t$ $t =$	$en = f$ $e = 2$ $f = 12$ $\underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = f$ $f =$
$ab = c$ $a = 6$ $b = 8$ $\underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = c$ $c =$	$e + c + g = t$ $e = 9$ $c = 6$ $g = 14$ $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = t$ $t =$
$a - b = c$ $a = 108$ $b = 11$ $\underline{\hspace{1cm}} - \underline{\hspace{1cm}} = c$ $c =$	$e - n = f$ $e = 125$ $n = 22$ $\underline{\hspace{1cm}} - \underline{\hspace{1cm}} = f$ $f =$

Part 3

Solve the word problems below

1) Jacob picked 15 apples (a) from each row of apple trees. He picked 75 apples in total (t). How many apples did he pick in each row (r)?

Equation : _____

Therefore, _____

2) They decided to budget (b) \$400 on dinner out for 4 nights. They spent \$90 on the first (f) dinner, \$110 on the second (s) dinner and \$85 on the third (t) dinner. How much do they have left for the fourth dinner (f)?

Equation : _____

3) A family of 6 (f) buy 24 (d) donuts. If each family member gets 4 donuts (d). How many donuts were there in total (t)?

Equation : _____

Therefore, _____

4) Hailey spent \$475 total (t) at a sporting goods store. She bought a new pair of sneakers (s) for \$275, new gloves (g) for \$130, and a new stick for (s) \$70. How much is s worth?

Equation : _____

Therefore, _____

Part 4

Use two different equations to find the area using the given measurements

#	Length	Width	Equation 1	Equation 2
1	10m	7m		
2	7cm	8cm		
3	9km	4km		

Part 5

Evaluate the following expressions for $x = 6$

1) $x + 11 - 3$	2) $4 + 3x$	3) $40 - 2x$
4) $6 + 12$	5) $4x - (5 + 5)$	6) $x + 3 \times 6$

Part 6

Emma and Savanna have answered the questions below. Circle who's right

	Question	Emma's Answer	Savanna's Answer
1	$y = 4$ $3 + (y + 5)$	7	14
2	$y = 3$ $20 - 5y$	5	5
3	$y = 2$ $y + 3 \times 3$	15	11
4	$y = 4$ $y + 16 \div 2$	12	10
5	$y = 8$ $y - 4 \times 2$	0	8