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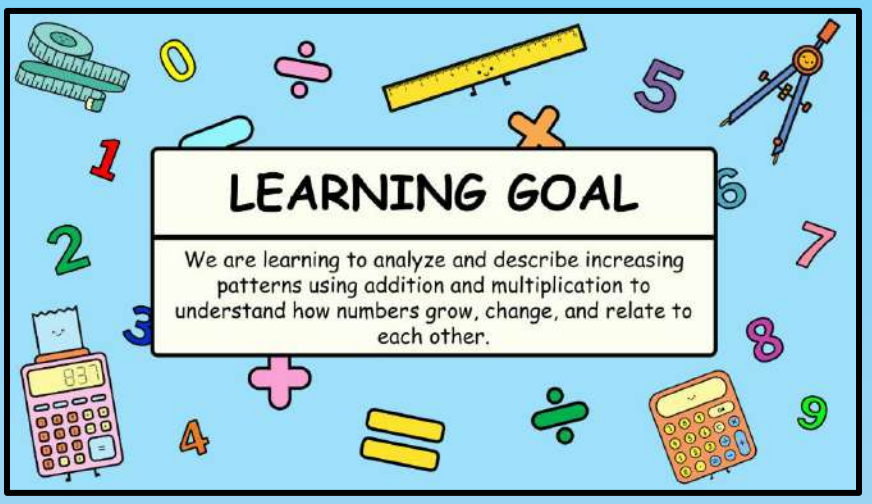
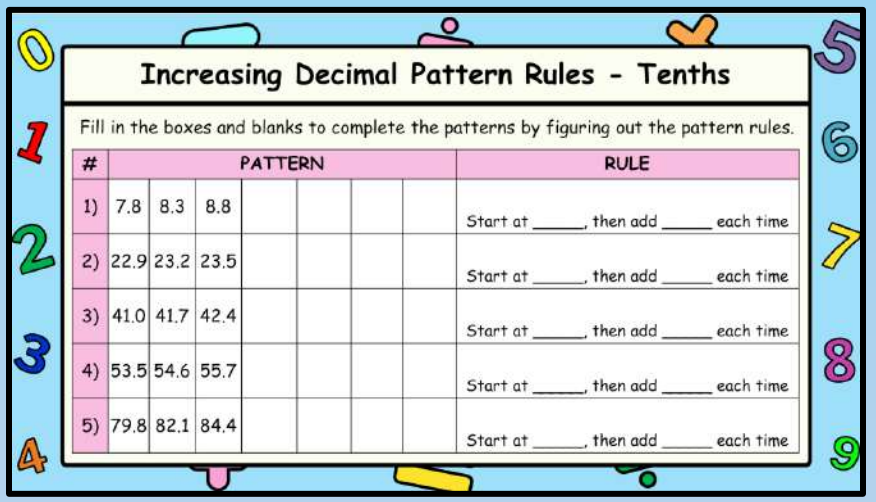
Google Slides Lessons Preview

BC Math Curriculum
Patterning & Equations – Grade 8

3-Part Lesson Format

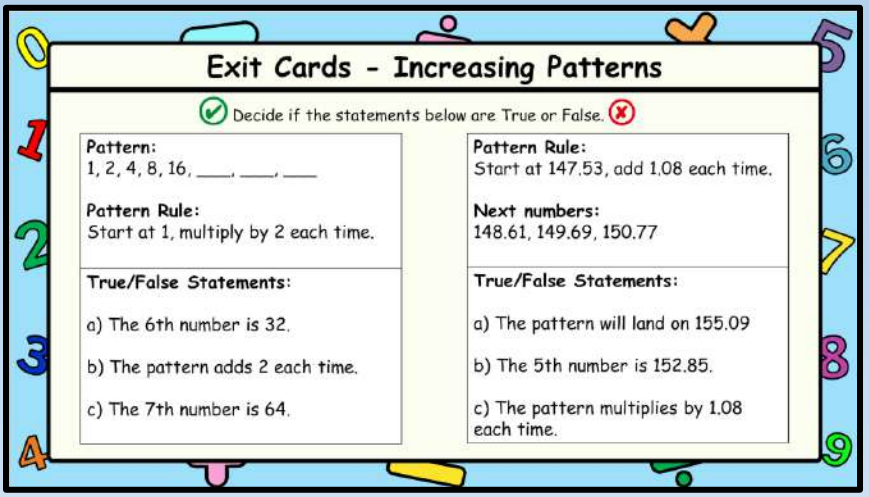
Part 1 – Minds On!
- Learning Goals
- Discussion Questions
- Quotes
- And More!



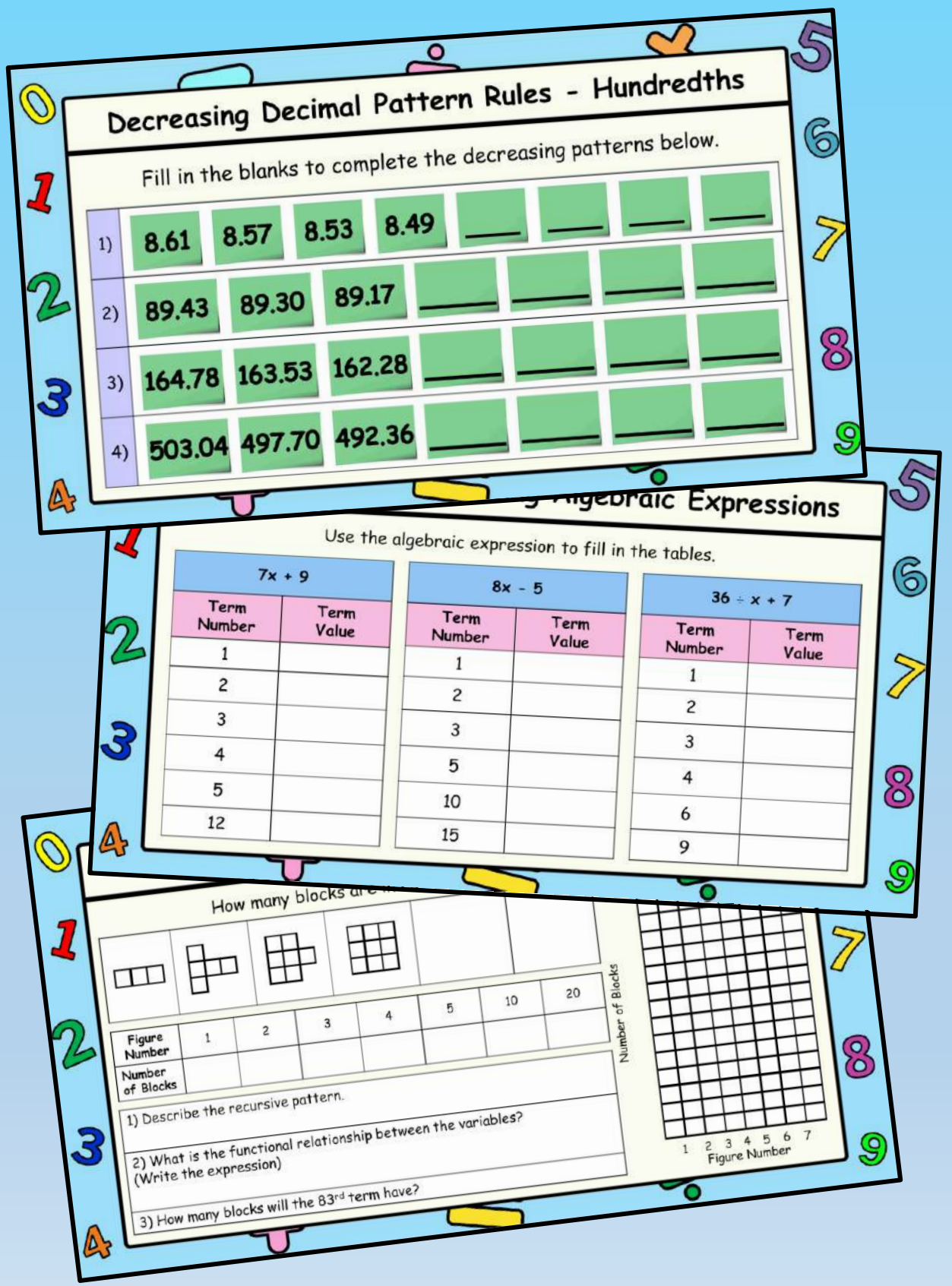


Part 2 – Action!
- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

Part 3 – Consolidation!
- Exit Cards
- Quizzes
- Reflection
- And More!



BC Math Curriculum
Patterning & Equations – Grade 8



BC Math Curriculum
Patterning & Equations – Grade 8

Workbook Preview

Grade 8
Patterning and Equations

Patterns

	Curriculum Expectations	Pages That Cover the Expectations
PE.1		

Name: _____ 6

Curriculum Connection
PE.1

Increasing Pattern Rules - Adding

Part 1 Continue the increasing patterns below.

1) 87, 93, 99, _____, _____, _____

Pattern Rule: Start at 87, add _____ each time

2) 148, 159, 170, _____, _____, _____

Pattern Rule: Start at _____ add _____ each time

3) 287, _____, _____, _____

Pattern Rule: Start at _____ add _____ each time

4) 346, 361, 3_____, _____, _____

Pattern Rule: Start at _____ each time

5) 503, 528, 553, _____, _____, _____

Pattern Rule: Start at _____ _____

BONUS

Nora gets paid based on how fast she works. She is getting faster each day! Check out her paycheque for the last 5 weeks.

Week	Pay
1	120
2	250
3	390
4	540
5	700

Question

How much will she make in week 10 if the pattern continues?

Part 2 Fill in the blanks below using the patte_____ule.

1) Start at 27, add 16 each time

2) Start at 9, add 22 each time

3) Start at 15, add 25 each time

4) Start at 74, add 13 each time

5) Start at 118, add 31 each time

Name: _____ 9

Curriculum Connection
PE.1

Decreasing Subtraction Patterns

Decreasing Patterns

-10 -10 -10 -10 -10

60, 50, 40, 30, 20, 10

-5 -5 -5 -5 -5

45, 40, 35, 30, 25, 20

Part 1 Decreasing Patterns - Subtracting

1) 8_____, _____, _____	2) 122, 116, 110, _____, _____, _____
3) 177, 168, 1_____, _____, _____	4) 264, 253, 242, _____, _____, _____
5) 337, 329, 321, _____, _____, _____	6) 466, 452, 438, _____, _____, _____
7) 597, 574, 551, _____, _____, _____	8) 754, 722, _____, _____, _____
9) 891, 874, 857, _____, _____, _____	10) 9_____80, 9_____, _____, _____

Part 2 Challenging subtraction patterns – f_____ blanks_____.

1)	125	115	106	98	91					
2)	188	168	150	134	120					
3)	300	250	205	165	130					
4)	700	600	510	430	360					
5)	1000	800	625	475	350					

Name: _____ 11

Curriculum Connection
PE.1

Pattern Rule – Multiplication

Part 1 Continue the increasing patterns below.

1) 2, 10, 50, _____, _____, _____, _____, _____

Pattern Rule: Start at 2, multiply by _____ each time

2) 6, 30, _____, _____, _____, _____, _____

Pattern Rule: Start at _____ multiply by _____ each time

3) 3, 9, 27, _____, _____, _____, _____

Pattern Rule: Start at _____ multiply by _____ each time

4) 9, 18, 36, _____, _____, _____

Pattern Rule: Start at _____ each time

5) 10, 100, 1000, _____, _____, _____, _____

Pattern Rule: Start at _____ multiply by _____ each time

Part 2 Write your own patterns using the pattern rule.

1) _____, _____, _____, _____, _____

Pattern Rule: Start at 3, multiply by 4 each time

2) _____, _____, _____, _____, _____

Pattern Rule: Start at 12, multiply by 2 each time

3) _____, _____, _____, _____, _____

Pattern Rule: Start at 5, multiply by 3 each time

4) _____, _____, _____, _____, _____

Pattern Rule: Start at 25, multiply by 4 each time

Name: _____ 13

Curriculum Connection
PE.1

Pattern Rule – Division

Part 1 Continue the decreasing patterns below.

#	Pattern	Rule ÷ __
1)	4096, 2048, 1024, 512, 256, 128, 64	
2)	15625, 3125, 625, 125, 25, 5, 1	
3)	2, 4374, 1458, 486, 162, 54	
4)	9968 888, 648, 108, 18	
5)	16384 56, 32	
6)	26244, 8748, 2 , 324	

Part 2 Write your own patterns using

1) _____, _____, _____, _____, _____, _____

Pattern Rule: Start at 1024, divide by 2 each time

2) _____, _____, _____, _____, _____, _____

Pattern Rule: Start at 1215, divide by 3 each time

3) _____, _____, _____, _____, _____

Pattern Rule: Start at 125 000, divide by 5 each time

4) _____, _____, _____, _____, _____, _____

Pattern Rule: Start at 100 000 000, divide by 10 each time

Name: _____ 18

Curriculum Connection
PE.1

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

Mat W you need for the activity?

- Jeopardy b the n
- Buzzer or bell

Instructions How will you compl activ

1. Print the Jeopardy board on the next p
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: _____ 19

Curriculum Connection
PE.1

Jeopardy Questions | Ask students the questions below.

$100	$200	$300	$400	$500
87, 93, 99, _____	5.2, 5.5, 5.8, _____	Start at 1, multiply by 3 and add 1, what is the fourth term?	A plant grows 3.5 cm every week. If it was 12.3 cm tall at the start, how tall will it be after 3 weeks?	A builder lays 14.5 bricks per hour. If they have already laid 58 bricks, how many bricks will they have laid after 4 more hours of work?
148, 170, _____	15.8, 15.9, _____	rt at 6, divide by 2 add 1, what is 3rd m?	A rabbit population doubles every year. If there are 4 rabbits this year, how many will there be in 5 years?	A runner increases their distance by 1.75 km every week. If they started at 5.25 km, how far will they be running after 10 weeks?
82, 75, 68, _____	18.52, 18.59, 18.66, _____	Start ltipl 2 and ad 3, wh the fifth ter	need increases every hour. d at 40 km/h, speed b 4 h	A teacher's class size increases by 3.5 students every term. If the initial class size was 20 students, what will the class size be after 4 terms?
177, 168, 159, _____	35.7, 35.1, 34.5, _____	Start at 3, multiply by 4 and subtract 2, what is the fourth term?	gavel meters 5 meters on day, and 7.5 me the third day. How will it travel in total by the sixth day?	ives a raise of $1 ery year. If his sta $45,000, wh fter 6
2, 10, 50, _____	17.3, 16.8, 16.3, _____	Start at 7, multiply by 3 and subtract 1, what is the third term?	A train travels 75 km in the first hour, 112.5 km in the second hour, and 150 km in the third hour. How far will it travel in total by the fifth hour?	A swimmer increases their training distance by 2.25 km every week. If they started at 4.75 km, how far will they be swimming after 8 weeks?
9, 18, 36, _____	11.32, 11.53, 11.74, _____	Start at 6, multiply by 5 and add 2, what is the fourth term?	A tree grows 5.5 inches in the first year, 7.5 inches in the second year, and 9.5 inches in the third year. How much will it have grown in total by the sixth year?	A bank account balance increases by $75.50 every month due to interest. If the initial balance was $2500, what will the balance be after 10 months?

Name: _____ 20

Curriculum Connection
PE.1

Recursive vs Functional Relationships

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 two variables in a table of values. For a functional relationship, we look across the table instead of beside.

Part 1 — Is Hanna describing the recursive or functional relationship?

	Pattern				Hanna's Description	Recursive or Functional
1)	x			4	The pattern goes up by 5 each time.	
	y	7		22		
2)	x	5		15	The y variable goes up by 50 each time	
	y	50	100			
3)	x	1	2	3	4	is multiplied by 7 and 1 is added	
	y	8	15	22	29		
4)	x	1	2	3	4		
	y	5	14	23	32		
5)	x	1	2	3	4	Start at 17, add 6 each	
	y	17	23	29	35		

Part 2 — Provide a recursive and functional description of the patterns

	Pattern					Recursive	
1)	x	1	2	3	4	Functional	
	y	4	11	18	25		

	Pattern					Recursive	
2)	x	1	2	3	4	Functional	
	y	20	45	70	95		

Name: _____ 21

Curriculum Connection
PE.1

Table of Values – 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 term number and term value. To do this, we look across the table from the term number to the term value.

Practice Find the pattern rule when you look <u>across</u> the table of values.

Term Number	Term Value
1	6
2	12
3	18
4	
5	
8	

1) <u>6n</u>

Term Number	Term Value
1	3
2	8
3	13
4	
5	
9	

2) <u>5n - 2</u>

Term Number	Term Value
1	4
2	8
3	12
4	16
5	

3) _____

Term Number	Term Value
1	9
2	16
3	23
4	30
5	
9	

4) _____

Term Number	Term Value
1	6
2	9
3	12
4	15
5	
10	

5) _____

Term Number	Term Value
1	4
2	10
3	16
4	22
5	
11	

6) _____

Name: _____ 23

Curriculum Connection
PE.1

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 can represent any number.

Part 1 Use the algebraic expression to fill in the tables.

Term Number	Term Value
1	
3	
4	
5	
8	

1) $5x + 2$

Term Number	Term Value
1	
2	
3	
4	
5	
9	

4)

Term Number	Term Value
1	
2	
3	
4	
5	
11	

3) $t + 9$

Term Number	Term Value
1	
2	
3	
4	
5	
11	

4) $4n - 3$

Term Number	Term Value
1	
2	
4	
5	
10	
20	

5) $20 \div x + 8$

Term Number	Term Value
4	
5	
11	

6) $7x - 6$

Part 2 Write 4 algebraic expressions using:
Variable = n Constant term = 12 Numerical coefficient = 4

1	
2	

3	
4	

Name: _____ 24

Curriculum Connection
PE.1

Pattern Rule – Input/Output Tables

Instructions Fill in the input/output tables below.

1)

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

2)

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

3)

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

4)

In x	Out $5x - 4$
10	
20	
30	
40	
50	

5)

In	Out $10x$
2	
4	
6	
8	
10	

6)

In x	Out $50 + x$
1	
9	

7)

In p	Out $7p + 20$
20	
40	
60	
80	
100	

8)

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

9)

In p	Out $8p + 100$
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: _____

Fill in the input/output tables below.

In *n*	Out 12x ÷ 3
3	
5	
7	
9	
11	

Name: _____

Fill in the input/output tables below.

In *n*	Out 12x ÷ 3
3	
5	
7	
9	
11	

Name: _____

Fill in the input/output tables below.

In *n*	Out 12x ÷ 3
3	
5	
7	
9	
11	

Name: _____

Fill in the input/output tables below.

In *n*	12x ÷ 3
3	
5	
7	
9	
11	

Name: _____ 26

Curriculum Connection
PE.1

Activity Title: Algebraic Adventure Hunt

Objective

What are we learning about?

To help students understand and practice filling in input/output tables using given expressions involving all four operations through a fun and engaging treasure hunt.

Materials

What will you need for the activity?

- St tch or d use a smartphone)
- Index card
- Markers
- Small prizes o s (fo s)
- Tape

Instructions

How will you compl ctiv

1) Cut out the index cards with the input/outp es pr se will be the treasure hunt challenge questions.
2) Hide these cards around the classroom or in a desig fe o are taping them under chairs, desks, or tucked into non-obvious sp
3) Divide the class into small teams and give each team a stopwa or
4) Explain the game: each team will hunt for a card, fill in the table as qu kly as they can, and return to you for verification.
5) Start the timer when you say "Go!" Each team rushes to find their first card.
6) When a team thinks they have the correct answer, they come back to you for verification. If they get it right, the teacher keeps the card. If the answer is wrong, they can try again or hide the card back in its original spot and find a new card.
7) The game continues until all cards are found or you call time. The team with the most correct answers wins.
8) Discuss the game, focusing on the concepts taught on the cards.

Name: _____ 29

Curriculum Connection
PE.1

Instructions Cut out the cards below.

In z	Out z – 5+35	In x	Out x ÷ 5 +300	In v	Out 4v–16+1	In t	Out t + 92–11
10		10		33			
20		20		66		60	
30		30		99		90	
40		40				120	
50		50				150	

In z	Out 16z + 4	In y	Out 8y +	In w	Out 6w + 62	In u	Out u ÷ 4 – 5
1		3				40	
2		5		8		60	
3		7		12		80	
4		9		16		100	
5		11		20		120	

Name: _____ 30

Instructions

Cut out the cards below.

Curriculum Connection
PE.1

In h	Out h ÷ 6 + 5	In f	Out 5f – 51	In e	Out 15e + 20	In b	Out b ÷ 7 - 7
12		15		5		[illegible]	
24		20		9		70	
36		25		13		84	
48		30		[illegible]		98	
60		35		[illegible]		112	

In k	Out k ÷ 4 –18	In g	Out 13g	[illegible]	Out d ÷ 9 – 5	In c	Out 5c + 55
112		7		[illegible]5		3	
240		14		72		5	
304		21		99		7	
368		28		126		9	
432		35		153		11	

Name: _____ 31

Curriculum Connection
PE.1

Increasing Patterns

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

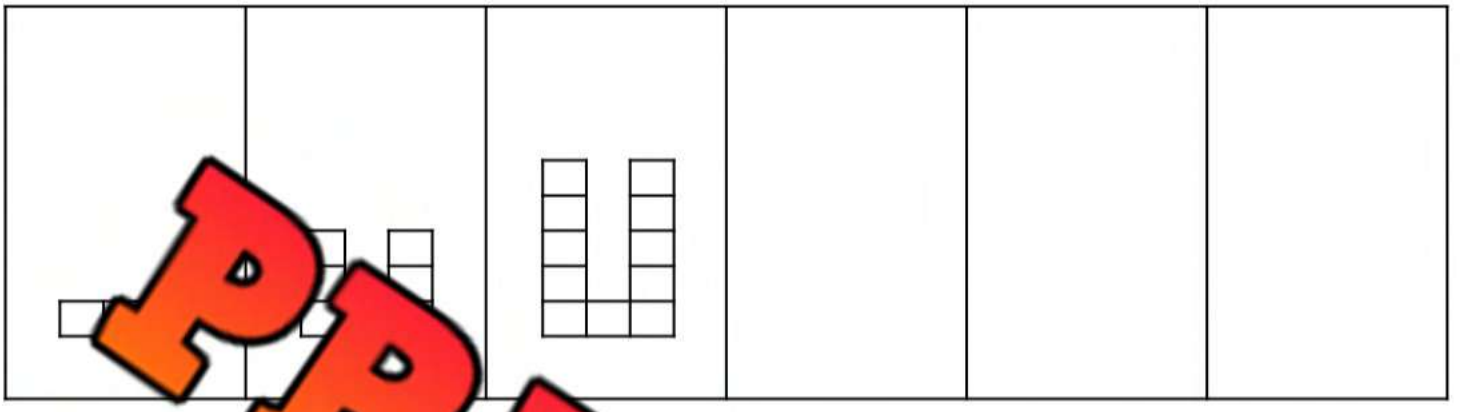
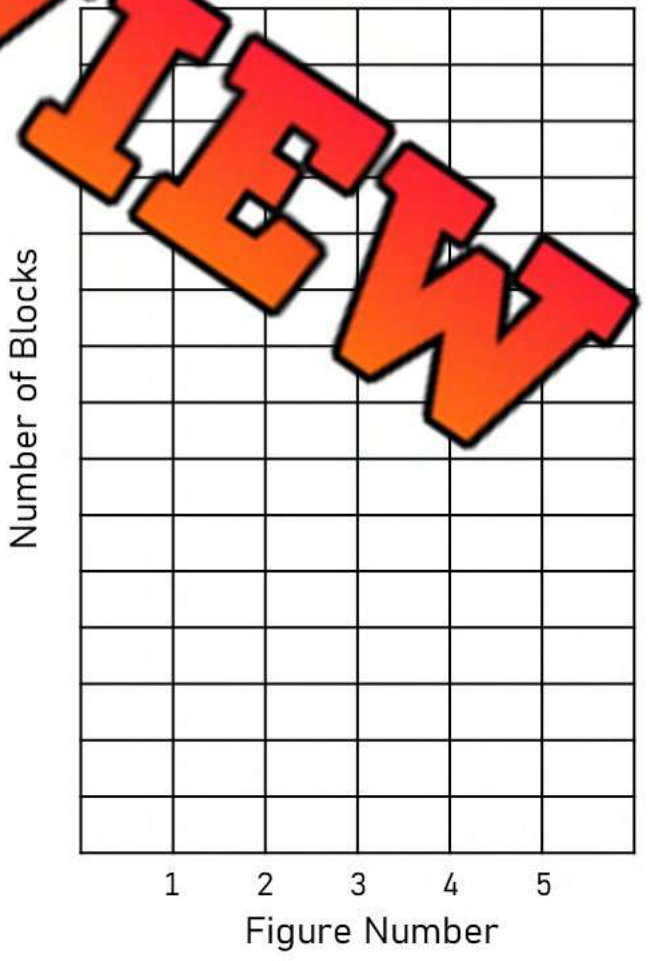


Figure Number			3	4	5	20	50
Number of Blocks							

1) Describe the recursive pattern?

2) What is the functional relationship between the variables? (Write the expression)

3) How many blocks would the 100th figure have?

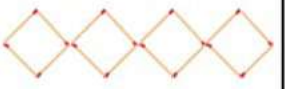


Name: _____ 33

Curriculum Connection
PE.1

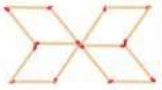
Matchstick Increasing Patterns

Instructions How many matchsticks are in each term? Sketch the next 2/3 terms.

F-1	F-2	F-3	F-4	F-5	F-6
					

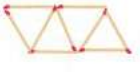
Write the functional relationship:

Figure #	1	2	3	4	5	6	20
# of matchsticks							

F-1	F-2	F-3	F-4	F-5	F-6
					

Write the functional relationship:

Figure #	1	2	3	4	5	6	20
# of matchsticks							

F-1	F-2	F-3	F-4	F-5	F-6
					

Write the functional relationship:

Figure #	1	2	3	4	5	6	20
# of matchsticks							

Name: _____ 34

Curriculum Connection
PE.1

Matchstick Increasing Patterns

Instructions How many matchsticks are in each figure? Draw the next 2 figures.

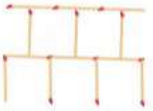
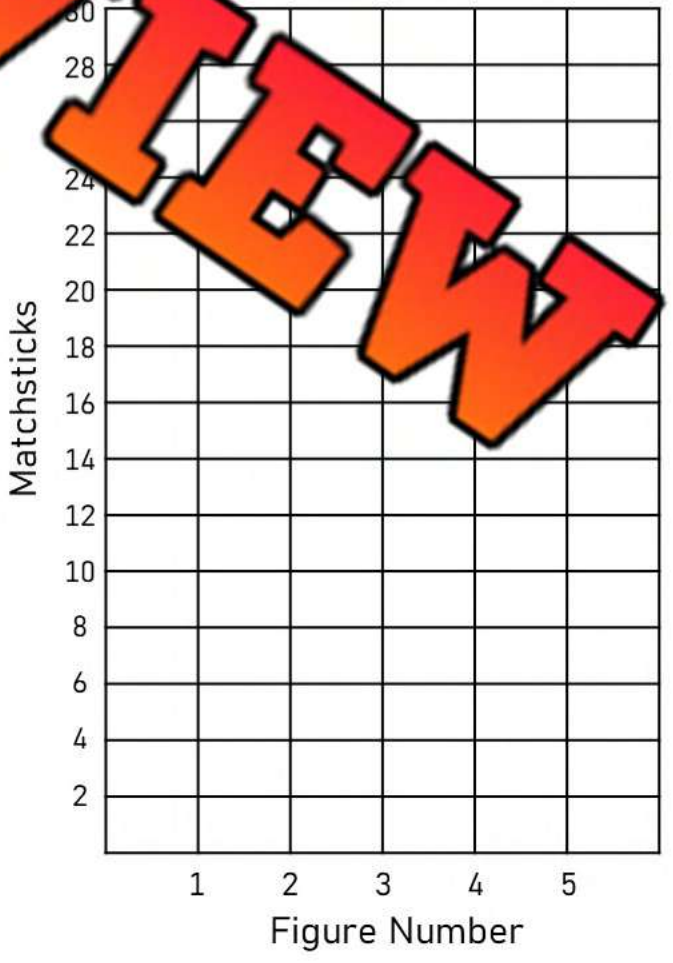
F-1	F-2	F-3	F-4	F-5
				

Figure Number			3	4	5	10	20
Number of Matchsticks							

Questions
1) Write an expression that represents the functional relationship.
2) How many matchsticks will the 7th term have?
3) How many matchsticks will the 10th term have?
4) What figure would use 201 matchsticks?



Name: _____ 36

Curriculum Connection
PE.1

Decreasing Patterns

Instructions How many grey blocks are in each term?

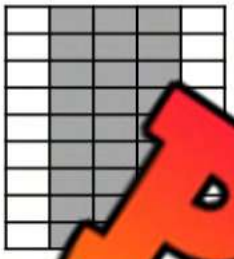
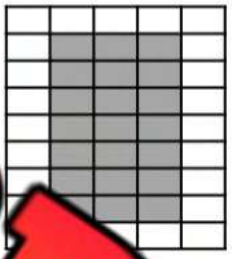
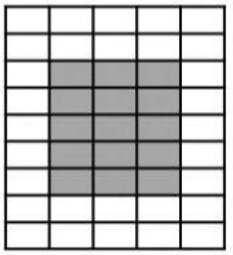
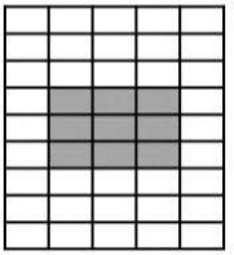
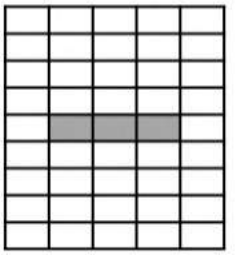
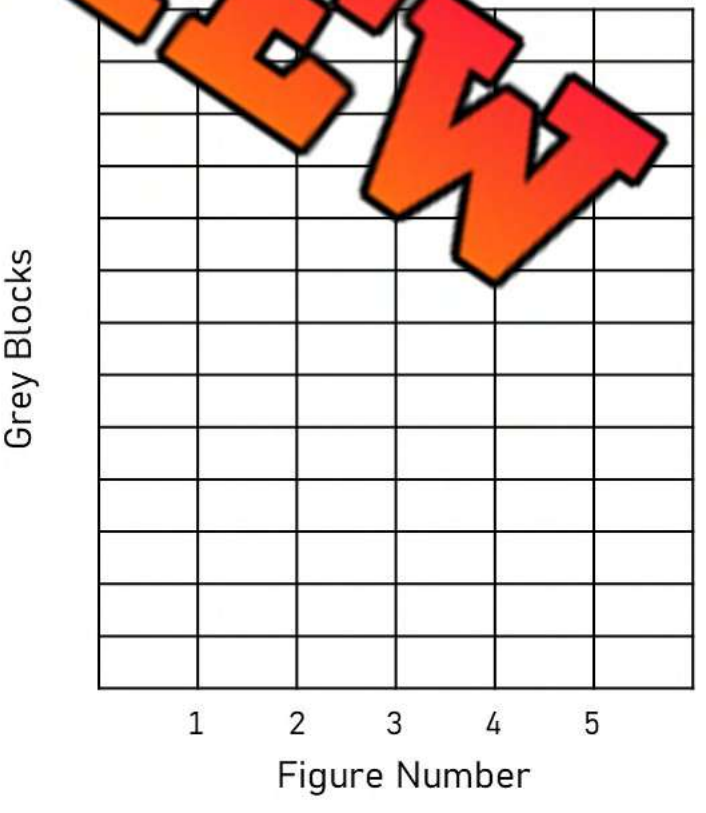
Figure 1	Figure 2	Figure 3	Figure 4	Figure 5
				

Figure Numb	1	2	3	4	5
Number Of Grey Blocks					
Number Of White Blocks					
Number Of Total Blocks					

Write the functional relationship between the two-variables below (Write the expression)
1) Figure number and grey blocks
2) Figure number and white blocks

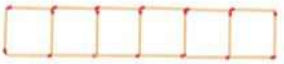
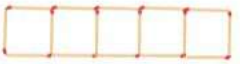


Name: _____ 37

Curriculum Connection
PE.1

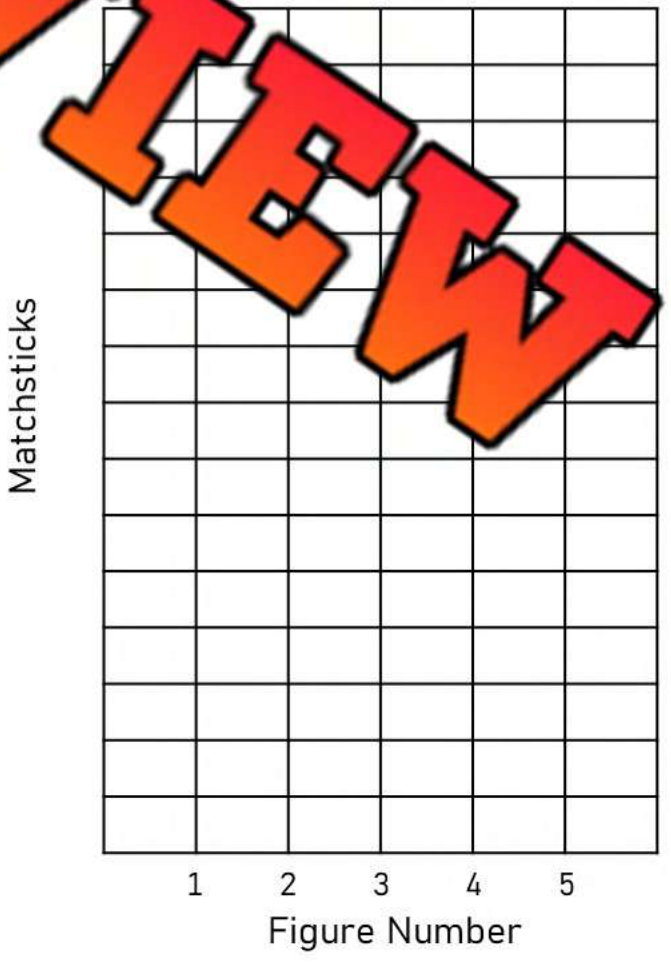
Matchstick Decreasing Patterns

Instructions How many matchsticks are in each figure? Draw the next 2 figures.

F-1	F-2	F-3	F-4	F-5
				

Fun[illegible]al Relationshi[illegible]on:				
Figure Number	1	3	4	5
Number of Matchsticks				

Questions
1) How many matchsticks will the 7th term have?
2) Is the line straight? If so, the relationship between the two variables is linear. Is there a linear relationship between the variables?
3) How many matchsticks in total would you need to make 8 figures?



Name: _____ 38

Curriculum Connection
PE.1

Two-Variable Linear Relationships

A **two-variable linear relationship** is when the increasing or decreasing of one variable causes a corresponding increase or decrease in the other variable. For example, driving 100km/hr would be a linear relationship between time driving and distance driven (for every hour driven, you travel 100km). As you drive longer, you travel further at a predictable distance.

Instructic Fill in the tables and answer the questions.

1) Ch… for today has been represented in the table below

Ho… orked (	1	2	3	4	5	6	7	8
Money Earn		44	66					

a) Is the relati… betw… variables linear? Yes No

b) What is the funct… onshi… een variables? _____

2) John sells cars. He earns a comm… …lls a car. His earnings for last week are represented in … ble be… …e were some days he did not earn commission.

Days Worked (*x*)	0	1	2			6	7
Money Earned (*y*)	0	140	280	620	0	900	240	1280

a) Is the relationship between variables linear? Yes …

b) If you graphed this relationship, would the line be straight … ain.

_____

_____

3) Greg has a membership to a shopping website. He pays a yearly membership fee and orders the same thing each week for 10 weeks. His spending is displayed below.

Weeks (*x*)	0	1	2	3	4	5	6	7
Money Spent (*y*)	50	80	110	140	170	200	230	260

a) Is the relationship between variables linear? Yes No

b) What is the functional relationship between variables? _____

c) If you graphed this relationship, would the line be straight or curved? Explain.

_____

Name: _____ 39

Curriculum Connection
PE.1

Two-Variable Linear Relationships

Instructions Answer the question below.

1) At an ice cream shop, you pay for the cone and then more money for every scoop you add.

Scoops (*x*)	0	1	2	3	4	5
Cost (*y*)	$2.00	$2.50	$3.00	$3.50	$4.00	$4.50

a) What is the functional relationship between the two variables (algebraic expression)?

b) How much does a cone cost?

c) How much would a scoop cost on a cone?

2) It costs $15 for admission to the museum. Once inside, you pay for each additional ride you go on.

Rides (*x*)	0	1	2		4	5
Total Cost (*y*)	$15.00	$17.50	$	$	25.00	$27.50

a) What is the functional relationship between the two (algebraic expression)

b) How much would it cost to go on 50 rides?

3) Roger rents a truck and pays a set rate for every 10km he drives.

KM Driven (*x*)	0	10	20	30	40	50	60	70	80
Cost (*y*)	$50	$55	$60	$65	$70	$75	$80	$85	$90

a) What is the functional relationship between the two variables (algebraic expression)

b) How much would it cost to drive 250km?

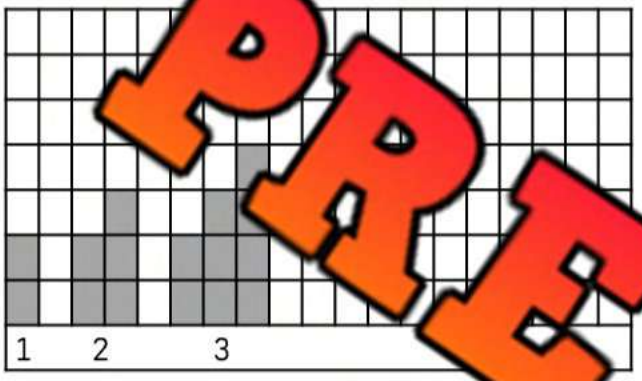
Name: _____ 41

Curriculum Connection
PE.1

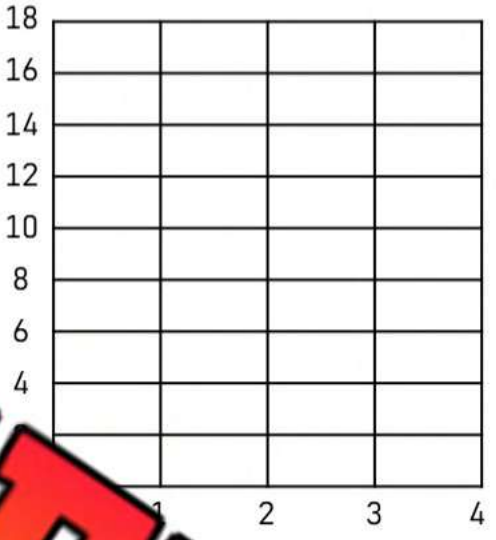
Linear and Non-Linear Patterns

Not all patterns are linear. Some patterns increase/decrease by the same amount each time, while others grow/shrink at different rates. When the pattern grows or shrinks by different amounts, it is called **non-linear.**

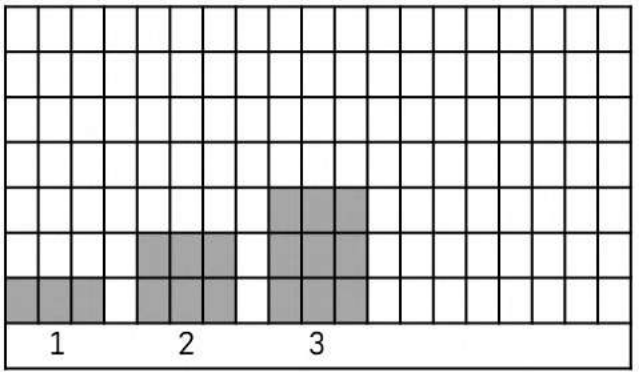
Instruction Look at the patterns below and fill in the table of values. Then complete the graph. Is the line straight?



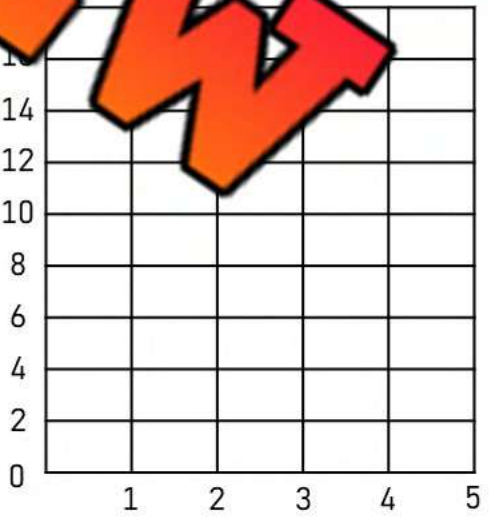
Term Number	Term Value
1	
2	
3	



1) Is this pattern linear or non-linear? Explain.



Term Number	Term Value
1	
2	
3	
4	
5	



1) Is this pattern linear or non-linear? Explain.

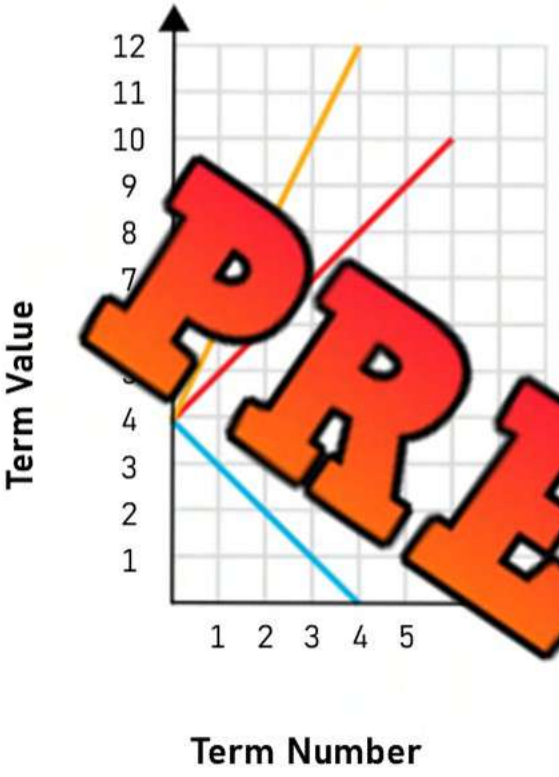
2) How many blocks would be in term number 10?

Name: _____ 42

Curriculum Connection
PE.1

Linear and Non-Linear Patterns

Instruction Look at the graphs closely. Answer the questions below.



1) How are the lines the same?

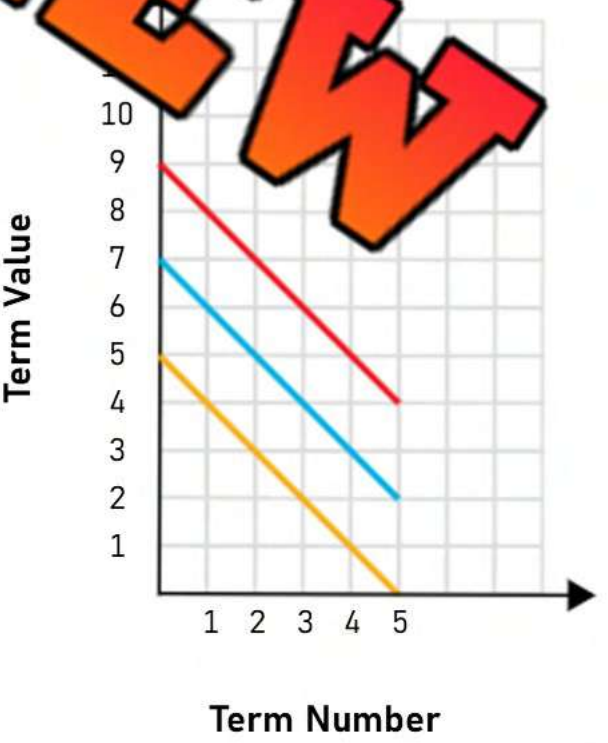
2) How are the lines different?

3) What could these three lines represent?

1) How are the lines the same?

2) How are the lines different?

3) What could these three lines represent?

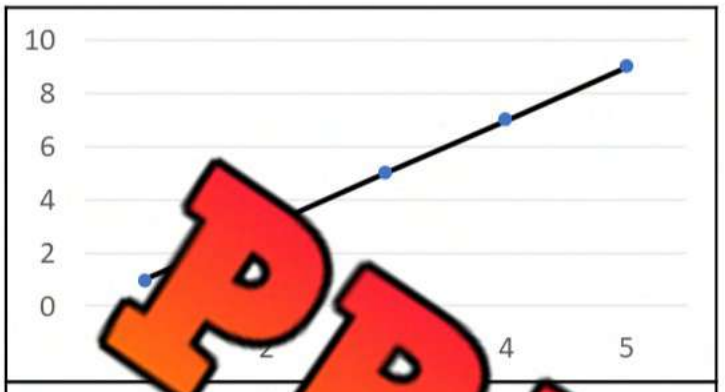


Name: _____ 43

Curriculum Connection
PE.1

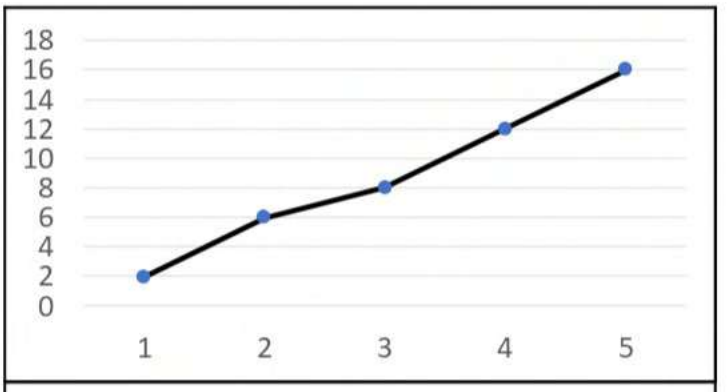
Increasing Linear Patterns – Yes or No?

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



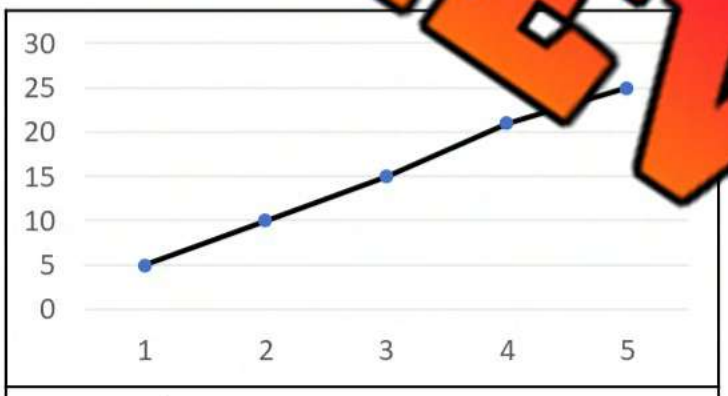
1) Linear Non-Linear

Rate of change =



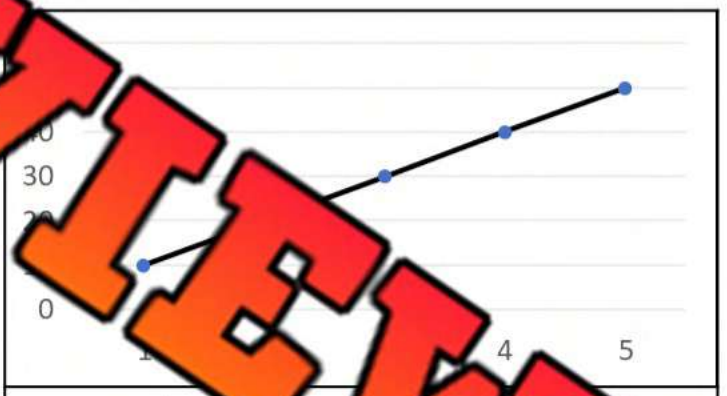
2) Linear Non-Linear

Rate of change =



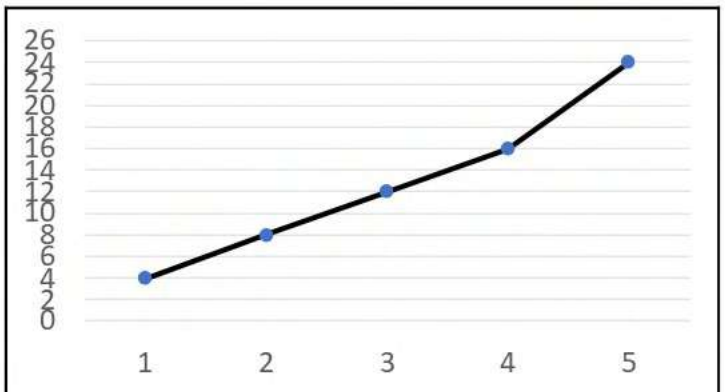
3) Linear Non-Linear

Rate of change =



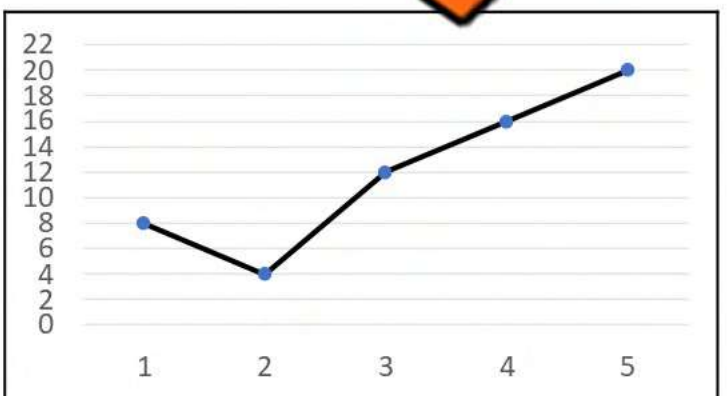
4) Linear Non-Linear

Rate of change =



5) Linear Non-Linear

Rate of change =



6) Linear Non-Linear

Rate of change =

Name: _____ 44

Curriculum Connection
PE.1

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	5
2	9
3	13
4	
5	
Linear	Non-Linear

Term Number	Term Value
1	37
2	44
3	51
4	57
5	64
Linear	Non-Linear

Term Number	Term Value
1	88
2	96
3	104
4	112
5	120
Linear	Non-Linear

Term Number	Term Value
1	2.5
2	4.5
3	6.5
4	8.5
5	10.5
Linear	Non-Linear

Term Number	Term Value
1	
2	
3	
4	
5	21.5
Linear	Non-Linear

Term Number	Term Value
1	200
2	275
3	350
4	425
5	
	n-Linear

Term Number	Term Value
1	44.0
2	47.5
3	50.5
4	54.0
5	57.5
Linear	Non-Linear

Term Number	Term Value
1	140
2	280
3	420
4	580
5	720
Linear	Non-Linear

Term Number	Term Value
1	112.1
2	112.3
3	112.5
4	112.7
5	112.9
Linear	Non-Linear

Name: _____ 48

Curriculum Connection
PE.1

Integer Pattern – Adding Word Problem

-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Instructions Answer the word problem below.

Richard is playing football. He plays defense, so he is often running backwards. He decides to track his steps forwards and backwards. For every step forward, he adds 1. For every step backward, he adds -1.

a) Each quarter he plays takes 75 steps forwards, and -150 steps backwards. If every step forward he takes is a step forwards, how many steps did Richard take in the first 3 quarters of the game?

b) Fill in the table of values that represents how many steps Richard takes in two games (8 quarters).

Term Number (Quarter)							
Term Value (Steps)							

c) Write an algebraic expression to help you solve how many steps Richard took in n number of quarters.

d) In 5 games, does Richard take more steps forward or backward?

e) How many steps does Richard take in 5 games?

Name: _____ 49

Curriculum Connection
PE.1

Pattern Rule – Input/Output Tables - Integers

Instructions Fill in the input/output tables below.

1)

In n	Out $n + (-5)$
1	
2	
4	
5	

2)

In n	Out $2n + (-3)$
1	
2	
3	
4	

3)

In n	Out $n + 9$
-1	
-2	
-3	
-4	
-5	

4)

In x	Out $x + (-3)$
-2	
-4	
-6	
-8	
-10	

In	Out
4	
6	
8	
10	

6)

In x	Out $x + 13$
-1	

7)

In p	Out $2p + (-12)$
20	
40	
60	
80	
100	

8)

In p	Out $p + (-15)$
-3	
-6	
-9	
-12	
-15	

9)

In p	Out $p + (-12)$
-3	
-1	
2	
4	
6	

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.

In n	Out $5n + (-7)$
-2	
2	
5	
10	
20	

Name: _____

Fill in the input/output tables below.

In n	Out $5n + (-7)$
-2	
2	
5	
10	
20	

Name: _____

Fill in the input/output tables below.

In n	Out $5n + (-7)$
-2	
2	
5	
10	
20	

Name: _____

Fill in the input/output tables below.

In n	$5n + (-7)$
-2	
2	
5	
10	
20	

Name: _____ 52

Curriculum Connection
PE.1

Integer Patterns – Writing Subtraction Rules

-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Part 1 Write the subtraction pattern rule and complete the pattern.

1)						
7	4	1	-2			

2)						
	-6	-2	2			

3)						
-19			-1			

4)						
17	12					

5)						
-20	-16	-12	-8			

6)						
-18	-16	-14	-12			

7)						
-3	0	3	6			

Part 2 Write your own pattern and pattern rule by filling in the table.

1)						

2)						

3)						

Name: _____ 53

Curriculum Connection
PE.1

Pattern Rule – Input/Output Tables

Instructions Fill in the input/output tables below.

1)

In n	Out $n - (-4)$
1	
2	
4	
5	

2)

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

3)

In n	Out $n - 7$
-1	
-2	
-3	
-4	
-5	

4)

In x	Out $x - (-9)$
-2	
-4	
-6	
-8	
-10	

5)

In	Out
4	
6	
8	
10	

6)

In x	Out $x - 7$
-1	

7)

In p	Out $7p - 15$
20	
40	
60	
80	
100	

8)

In p	Out $p - (-14)$
-3	
-6	
-9	
-12	
-15	

9)

In p	Out $p - (-22)$
-3	
-1	
1	
3	
5	

Name: _____ 54

Curriculum Connection
PE.1

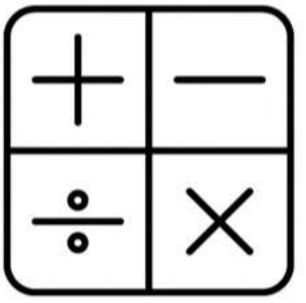
Task Cards: Patterning – All Operations

Objective What are we learning about?

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

Materials What will you need for the activity?

- 24 t
- S ets er for answers
- Pe



Instructions ll yo the activity?

1. Introduce the concept o s in perations and their relevance to problem-solving in everyda e.
2. Organize the students into pairs an ovide e air their sets of task cards.
3. Give each pair an answer recording sheet t dow ir ses.
4. Encourage teamwork by having students collabora ir p on finding solutions.
5. Allow students to select any task card to begin with, emphasiz n complete the cards in any order they prefer.
6. Instruct students to record the letter of their chosen answer (A, B, or C) on their answer sheet beside the task card's number.
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.

Name: _____ 56

Curriculum Connection
PE.1

Task Cards | Cut out the task cards below.

Card 9:
Start with 55. Add 30 and then subtract 20 for the next number. What is the fourth number?

a) 65
b) 75
c) 85

Card 13:
Start at -15, add 10 each time. What is the fifth number?

a) 25
b) -5
c) 15

Card 10:
Begin with 1[illegible] 50 [illegible] then divide by 2 fo[illegible] numb[illegible]t is the thi[illegible]mbe[illegible]

a) 10
b) 35
c) -7.5

Card 14:
Start with -50. Multiply by 2 and then add 30 for the next number. What is the fourth number?

a) -40
b) -110
c) -190

Card 11:
Begin with 85. Subtract 45 and then multiply by 2 for the next number. What is the fifth number?

a) 0
b) 80
c) 10

Card 15:
Sta[illegible]vi[illegible]b[illegible]and then add 25 fo[illegible]num[illegible]What is the [illegible]d n[illegible]

a)
b) 34
c) 35

Card 12:
Start with 25. Multiply by 4 and then subtract 20 for the next number. What is the third number?

a) 80
b) 320
c) 300

Card 16:
Begin with 160. Divide by 8 and then subtract 5 for the next number. What is the second number?

a) 15
b) 20
c) 10

Name: _____ 57

Curriculum Connection
PE.1

Task Cards | Cut out the task cards below.

Card 17:
Start with 45. Add 25 and then subtract 30 for the next number. What is the sixth number?

a) 40
b) 25
c) 20

Card 21:
Start at -25, add 20 each time. What is the seventh number?

a) 100
b) -35
c) 95

Card 18:
Begin with 2[illegible] 80[illegible] then divide by 4 fo[illegible] numb[illegible]t is the sec[illegible]umb[illegible]

a) 30
b) 25
c) 20

Card 22:
Start with -45. Multiply by 3 and then add 25 for the next number. What is the third number?

a) -110
b) -220
c) -305

Card 19:
Begin with 75. Subtract 35 and then multiply by 3 for the next number. What is the fourth number?

a) 1875
b) 660
c) 255

Card 23:
Sta[illegible]id b[illegible]nd then add 9 for the [illegible]ber. [illegible]s the fourth [illegible]umb[illegible]

a)
b) 11
c) 19

Card 20:
Start with 50. Multiply by 2 and then subtract 25 for the next number. What is the third number?

a) 75
b) 125
c) 100

Card 24:
Begin with 170. Divide by 5 and then subtract 10 for the next number. What is the second number?

a) 20
b) 24
c) 34

Name: _____ 58

Curriculum Connection
PE.1

Linear Equations – Table of Values

A **linear equation** is an equation that is written for two different variables. The variables have a relationship where they increase or decrease at the same rate. This means when the variables are plotted on a graph, the line will be straight.

It is helpful to use a table of values to represent the values of both variables. This allows us to see the relationship between the variables. We can find any missing value by using an equation that represents the relationship between the variables. A related pair of *x* and *y* values is called an ordered pair.

Practice Complete the tables using the equations below.

x	*y*
1	
2	14
3	20
4	
5	
6	

x	*y*
	-2
2	1
3	
4	
5	
9	

x	*y*
1	
2	
3	
4	
5	

1) $y = 6x + 2$

2) $y = 3x - 5$

x	*y*
1	
2	
3	
4	
5	
9	

x	*y*
1	
2	
3	
4	
5	
10	

x	*y*
1	
2	
3	
4	
5	
11	

4) $y = 4x - 7$

5) $y = -3x - 4$

6) $y = 5x - (-8)$

Name: _____ 59

Curriculum Connection
PE.1

Linear Equations – Table of Values

Practice Write the equation that represents the relation between x and y.

x	y
1	2
2	9
3	16
4	
5	
6	

1) _____

x	y
1	-7
2	-11
3	-15
4	-19
5	
9	

_____

x	y
1	-3
2	0
3	3
4	6
5	
11	

3) _____

x	y
1	5
2	0
3	-5
4	-10
5	
9	

4) _____

x	y
1	-2
2	
3	
4	16
5	
10	

5) _____

x	y
1	-7
2	-18
3	-29
	-40

6) _____

Practice Read the problem and represent it in the table of values.

An ice cream shop sells cones for $3 and toppings for $2 each. An equation for this relation is $y = 2x + 3$ where the 3 dollars is constant, and the x represents how many toppings are chosen.

a) Fill in the table of values

b) Fill in the ordered pairs below – Remember (x, y)

(1, ___) (2, ___) (3, ___) (8, ___) (12, ___) (20, ___)

x	y
1	
2	
3	
4	
5	

Name: _____ 61

Curriculum Connection
PE.1

Linear Equations – Table of Values

Practice Make a table of values for each relation.

1) $y = 3x + 2$

2) $y = 5x - 6$

3) $y = -2x + 3$

4) $y = 4x - 2$

6) $y = -7x - 8$

Challenge Can you determine the equation using the

These ordered pairs are in the same linear relation: (-2, -4), (0, 4), (2, 12), (4, 20)

a) What is the equation that represents the values in the ordered pairs?

b) Fill in the missing value in the ordered pairs.
(1, ___), (3, ___), (8, ___), (-4, ___), (-8, ___), (___, 56) ,(___, -56)

c) Fill in the table of values for the linear relation.

x	-6	-3	0	5	7	12	15	20
y								

Name: _____ 62

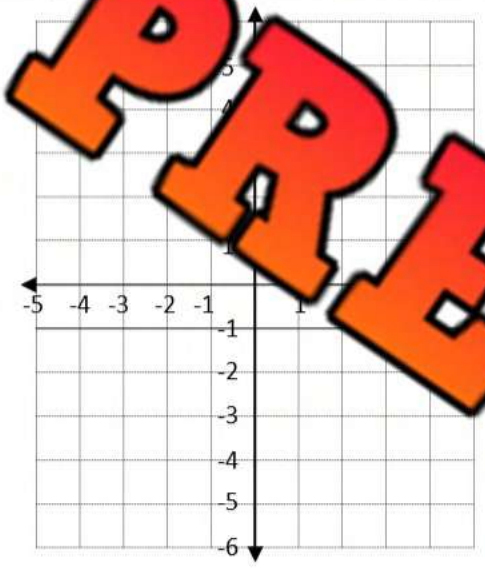
Curriculum Connection
PE.1

Linear Equations – Graphing 2 Variables

Instructions Fill in the table of values and then graph the results using ordered pairs.

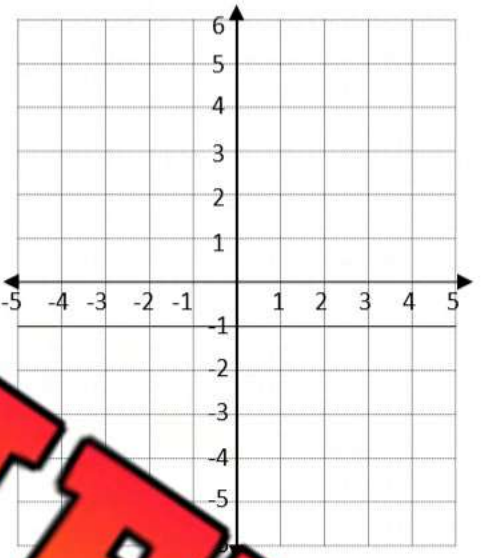
1) $y = 2x - 2$

x	0	1	2	3	4
y					



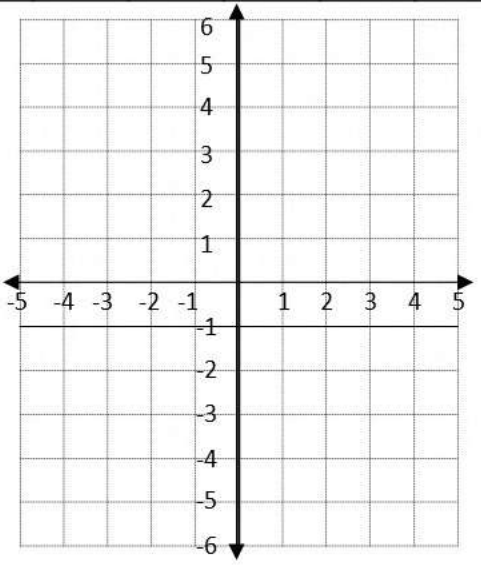
2) $y = 3x - 6$

x	0	1	2	3	4
y					



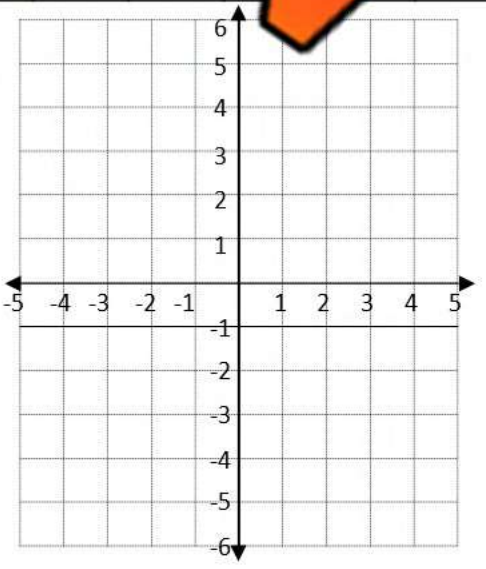
3) $y = -x + 2$

x	0	1	2	3	4
y					



4) $y =$ 3

x		1			
y					



Name: _____ 63

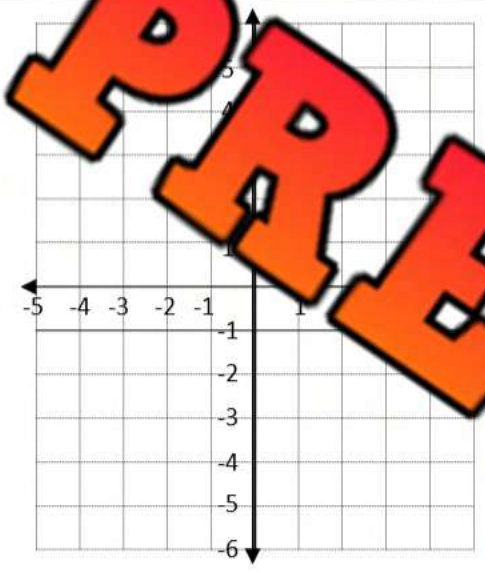
Curriculum Connection
PE.1

Linear Equations – Graphing 2 Variables

Instructions Fill in the table of values and then graph the results using ordered pairs.

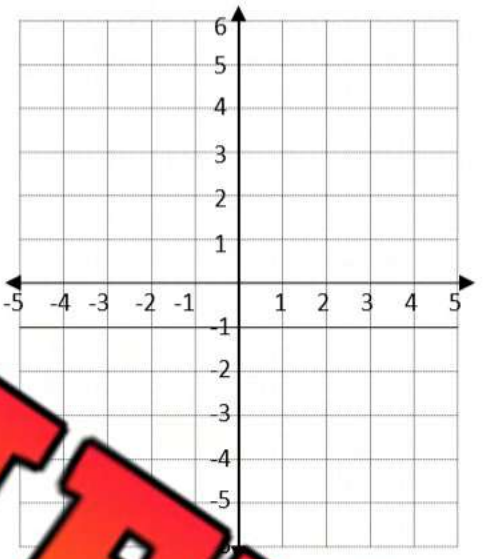
1) $y = -2x - 2$

x	0	1	2	3	4
y					



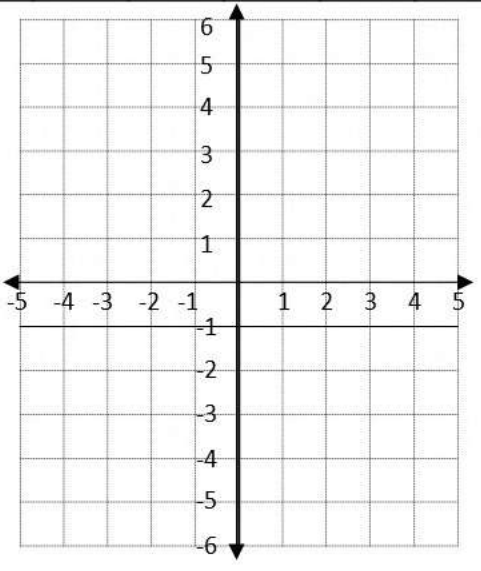
2) $y = -x + 4$

x	0	1	2	3	4
y					



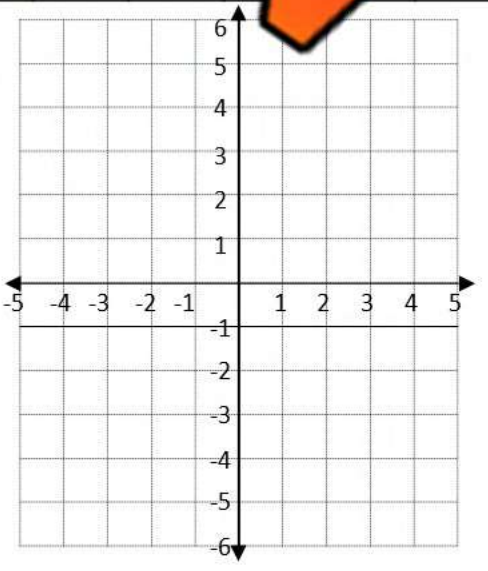
3) $y = -3x + 4$

x	0	1	2	3	4
y					



4) y [illegible] $- 4$

x	[illegible]	1	[illegible]	[illegible]	[illegible]
y					



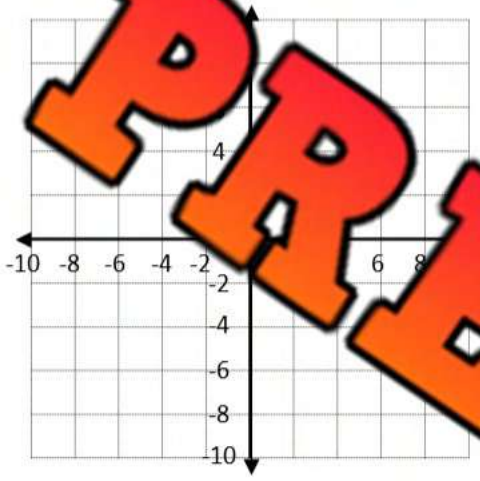
Name: _____ 64

Curriculum Connection
PE.1

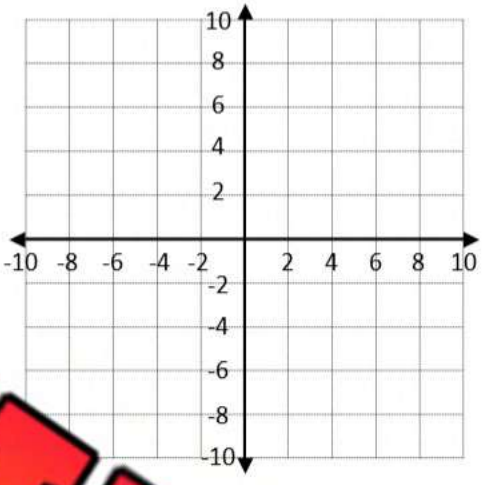
Linear Equations – Graphing 2 Variables

Instructions Graph the equations below. Create a table of values if necessary.

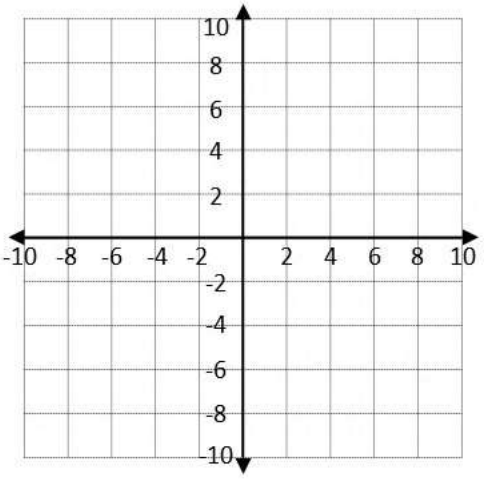
1) $y = 3x - 4$



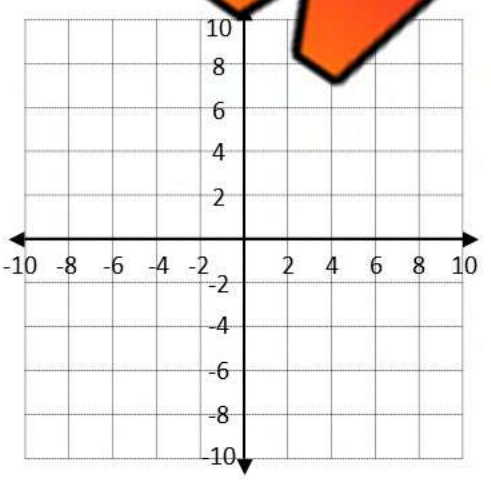
2) $y = -4x + 10$



3) $y = -3x + 8$



4) $y = 4$



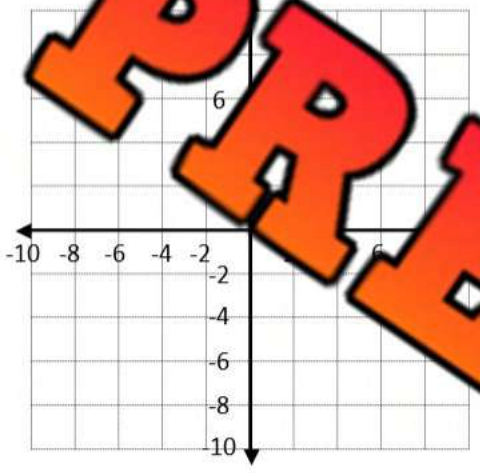
Exit Cards

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

Name: _____

Graph the equations below.

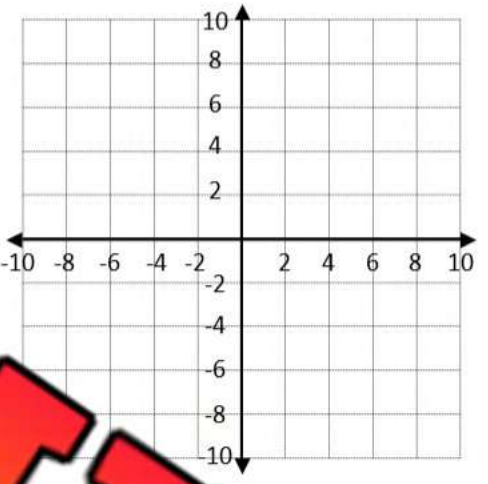
y = -6x +



Name: _____

Graph the equations below.

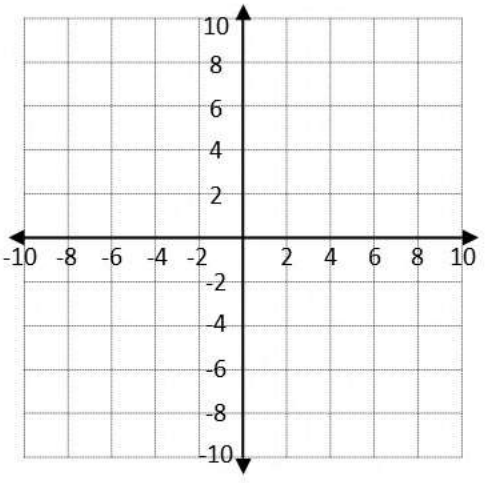
y = -6x + 4



Name: _____

Graph the equations below.

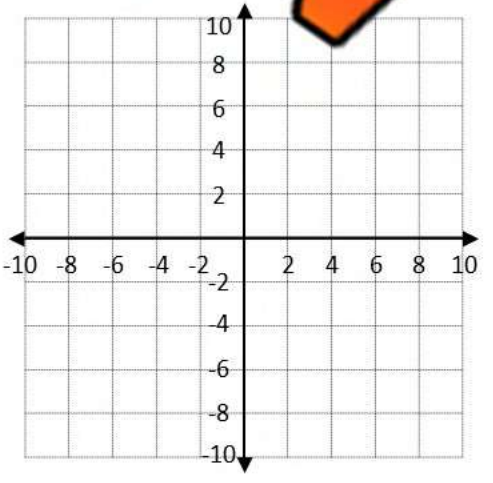
y = -6x + 4



Name: _____

Graph the equation

y = -6x + 4



Name: _____ 67

Curriculum Connection
PE.1

Two-Variable Linear Relationship - Scientist

Challenge Answer the word problem below.

Mrs. Ferrety teaches a grade 8 class. She invited a scientist to join her class to do some experiments with them. The scientist charges $40 for the materials they use for the experiments, plus an additional $3 per student who is in the class.

a) Fill in the table of values below using the linear equation: $y = 3x + 40$

# of Students						
Cost						

b) Graph the table of values

Questions

a) Fill in the missing values in the ordered pairs below:

(25, _____), (50, _____), (100, _____)

(_____, 67), (_____, 85), (_____, 106)

b) If 28 students are in the class, how much money will the scientist earn for their presentation?

c) If the scientist earned $136, how many students were in the class?

Name: _____ 68

Curriculum Connection
PE.1

Two-Variable Linear Relationship - Working

Word Problems Investigate the relationship between the two-variables.

Stephanie earns $15 for every hour she works. She received a starting bonus of $50 before even working an hour.

1) Fill in the table of values to represent the linear relationship between hours worked and money earned.

2) Graph the table of values.

3) Questions

a) Write the linear equation that represents this situation.

b) Stephanie is scheduled to work 35 hours this week. How much will she earn with her bonus?

c) Fill in the missing values in the ordered pairs below.

(10, _____), (42, _____), (75, _____)

(____, 320), (____, 1055), (____, 3050)

d) Stephanie earned $1580 in her first month of work, including her bonus. How many hours did she work?

Name: _____ 69

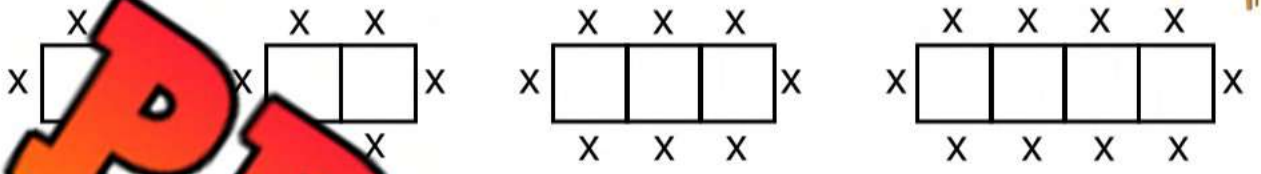
Curriculum Connection
PE.1

Graphing Linear Equations - Tables

Challenge Answer the word problem below.

You have been put in charge of organizing the end of 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.



Fill in the table below to represent the relationship between the number of tables and seats.

Tables (*x*)				4	5	10	20	50
# of Seats (y)								

Questions
a) Write the linear equation that represents this problem.
b) If you had 61 tables, how many seats would you have?
c) Fill in the missing values in the ordered pairs below (15, _____), (75, _____), (135, _____) (_____, 132), (_____, 174), (_____, 500)
d) If you had 100 people attending the banquet, how many tables would you need?

Name: _____ 70

Curriculum Connection
PE.1

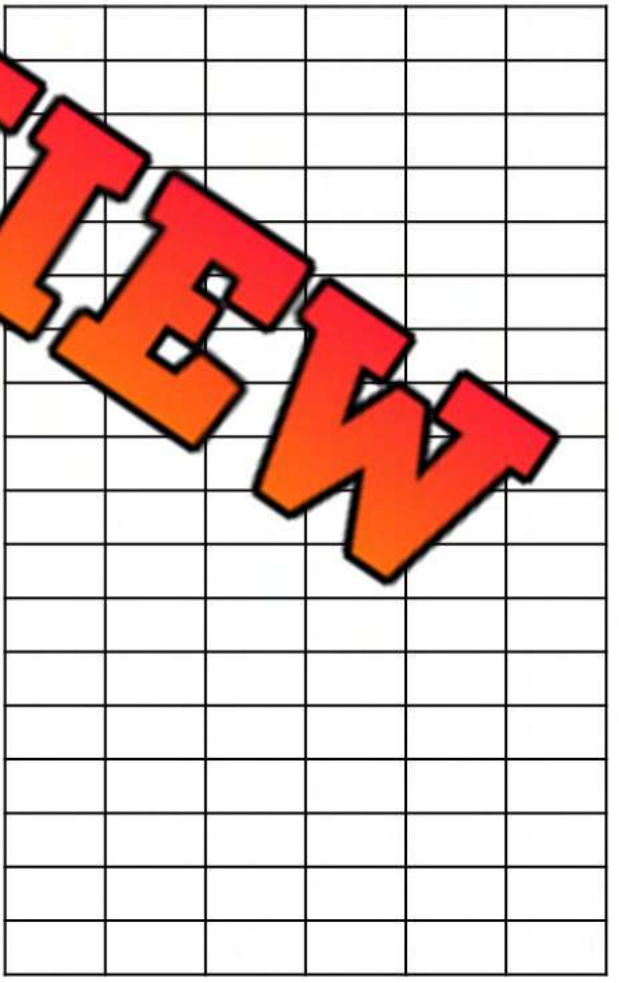
Two-Variable Linear Relationship – Moving Day

Challenge Answer the word problem below.

Aiden's family is moving. They rented a moving truck for $50 a day. They are charged an additional $0.50 for every 1km they drive.

1) Fill in the table of values below.

2) Graph the



3) Questions

a) Write the linear equation that represents this problem.

b) If Aiden's family drove 330km in one day, how much would they need to pay?

c) Fill in the missing values in the ordered pairs below.

(15, _____), (75, _____), (135, _____)

(_____, 130), (_____, 240), (_____, 500)

d) Aiden's family owes $660 to the moving company. How far did they drive?

Name: _____ 71

Curriculum Connection
PE.1

Linear Equations – Graphing 2 Variables

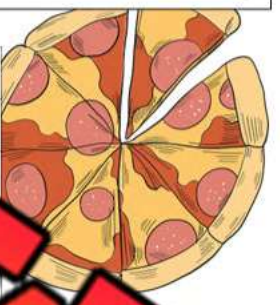
Instructions Fill in the table of values and then graph the results using ordered pairs.

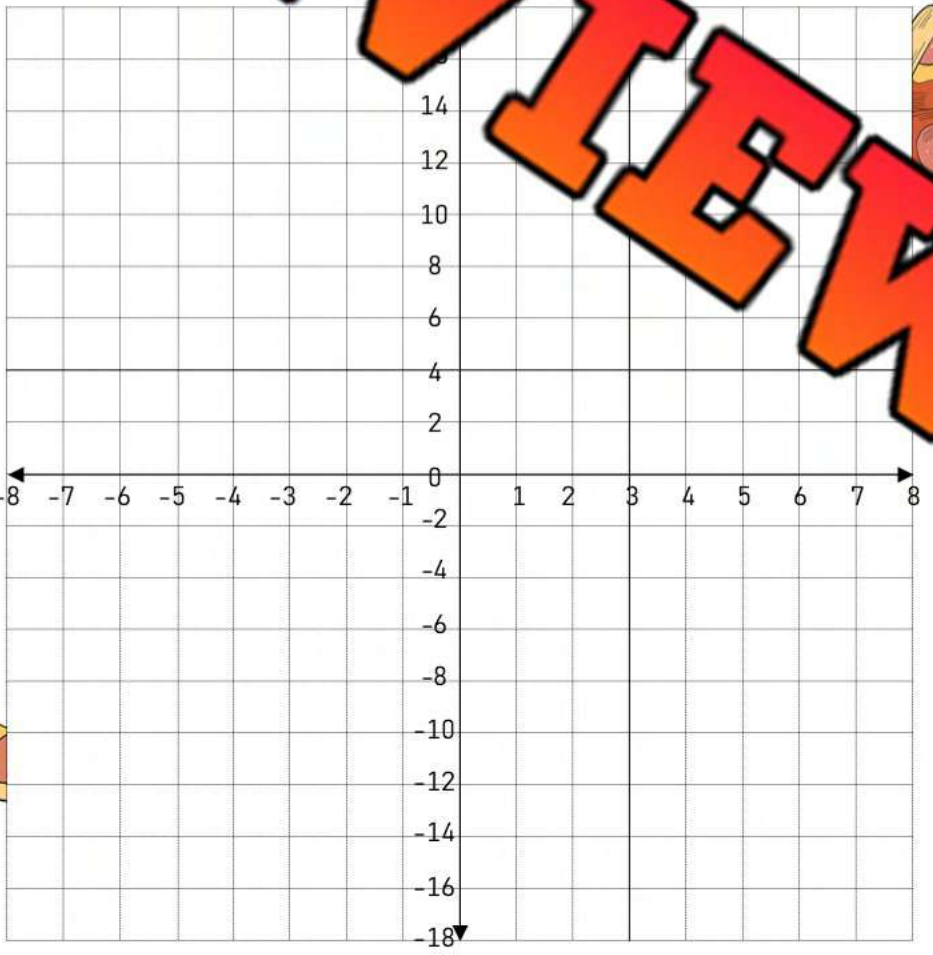
Matt is hosting a pizza party. He will buy 2 slices for each person coming and 4 extra slices in case someone shows up unexpectedly. He determined an equation that will help him decide how many slices to buy: $y = 2x + 4$

a) Fill in the table of values using the equation above.

x	0	1	2	3	4	5	6
y							

b) Represent the values on the graph. Connect the dots using a line. Is the relation linear? Explain.





Name: _____ 72

Curriculum Connection
PE.1

Linear Equations – Graphing 2 Variables

Instructions Fill in the table of values and then graph the results using ordered pairs.

Hadley sells her homemade scarfs at a flee market. It costs her $10 to rent a table but she makes $5 each hour she is there. She uses the following equation to represent her earnings: $y = 5x - 10$

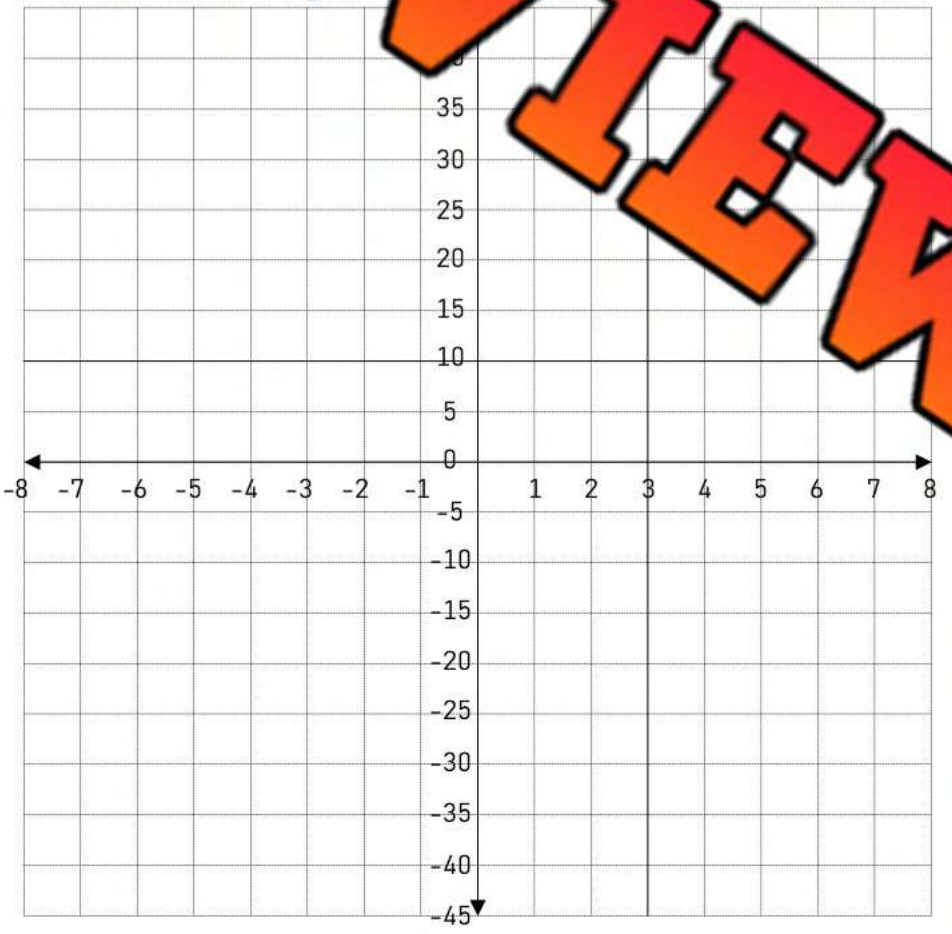
a) Fill in the table of values using the equation above.

x		2	3	4	5	6	7	8
y								

b) Represent the values in the table on the graph. Connect the dots using a line.

c) Fill in the missing values in the ordered pairs below

(10, ___), (20, ___), (, ___), (, 80), (___, 100), (___, 150)



Name: _____ 73

Curriculum Connection
PE.1

Graphing Linear Equations - Exercise

Instructions Answer the questions below.

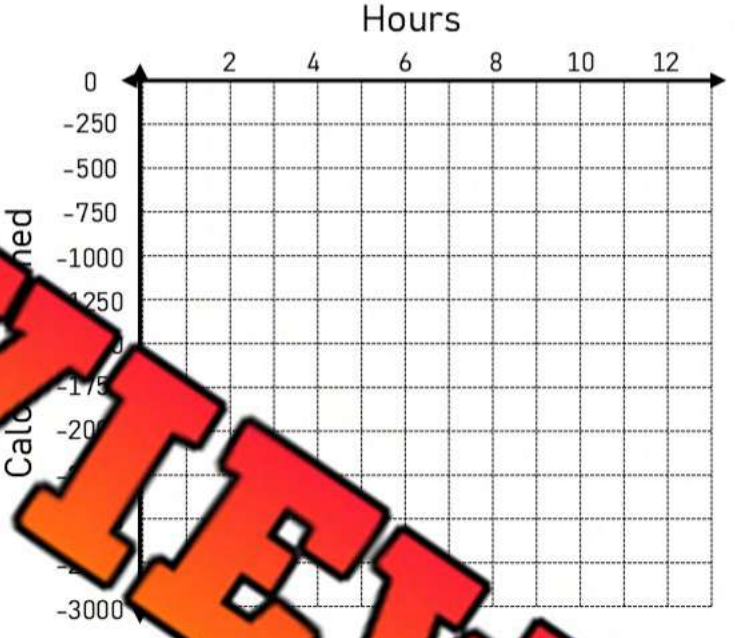
For every 1-hour Logan exercises, he burns 250 calories. Use negative integers to fill in the table of values that tracks Logan's calorie burn.

1-Hour	2-Hours	3-Hours	4-Hours	5-Hours	6-Hours	7-Hours

a) If Logan exe... hours a week, ho... burn?

b) Write the linear equation that represents the situation. Use multiplication and a negative integer.

c) If Logan has already burned 750 calories this week, how many more hours will he need to exercise to burn 2250 calories? Write an equation that represents the situation.



d) Describe the re... the two variab... words.

e) Fill in the missing values in the ordered pairs below

(14, _____), (20, _____), (32, _____)

(____, -4250), (____, -6500), (____, -9750)

Name: _____ 74

Curriculum Connection
PE.1

Graphing Linear Equations - Advertising

Instructions Answer the questions below.

Chloe has an advertising budget of $150. She decides to spend $15 a day. Use negative integers to fill in the table of values that tracks her advertising spending. Display the table of values as a graph as well.

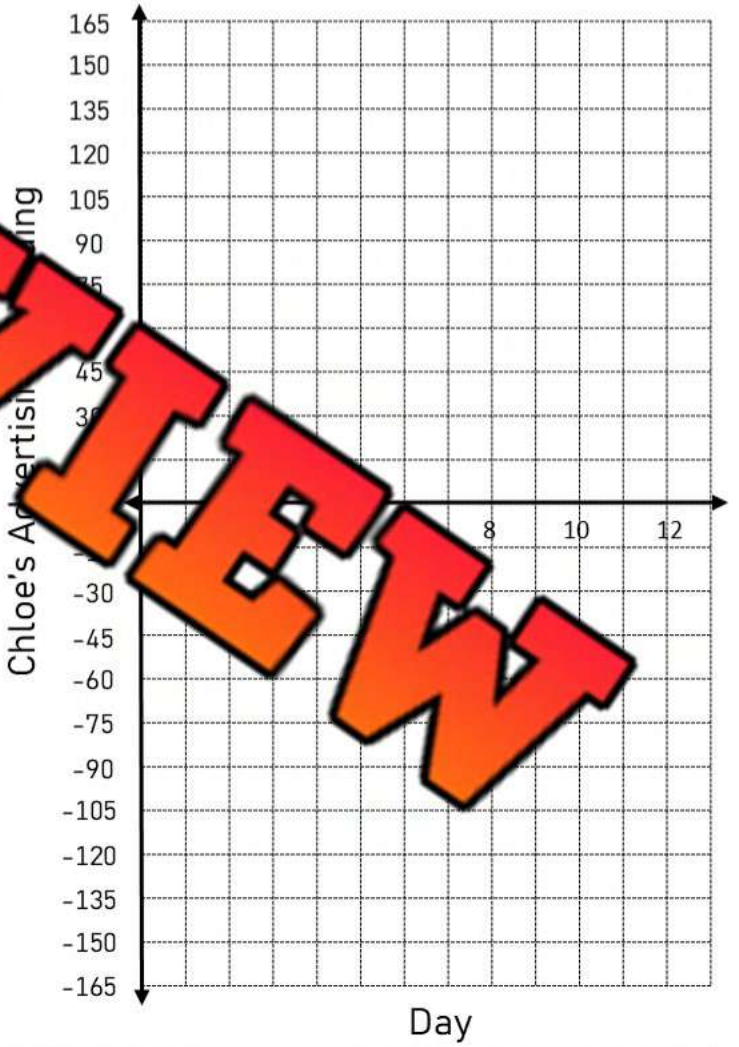
Qu

1) After 20 da… …of a …et will Chloe have … …gative…

2) Write the linear equation that represents the situation. Use multiplication and a negative integer.

3) Chloe has discovered that she earns $20 a day from people buying her products after seeing her advertisements. Use the numbers/operations below to write a new linear equation that represents the situation.

y x -15 20 + =



4) Matthew answered the question above using this equation: y = x(-15) + 20 but he isn't getting the correct answer. How could he move one bracket to get the correct answer? Why was he wrong before?

Name: _____ 75

Algebra Quiz - Patterning

Part 1 How many matchsticks are in each term? Sketch the next 3 terms

F-1	F-2	F-3	F-4	F-5	F-6
					

What i[illegible]tional p	Expression:					
F[illegible]#	2	3	4	5	6	20
# of Matchsti[illegible]						

Part 2 [illegible]nd answer the questions

1) Cole's pay for today has [illegible] re[illegible] table below

Hours Worked	0	1	[illegible]	3	[illegible]	6	7	8
Money Earned ($)	0	27	54	8[illegible]				

a) Is the relationship between the variables linea[illegible]s No

b) What is the functional relationship between variable[illegible]

2) It costs $30 for admission to an amusement park. Once inside, yo[illegible]or each additional ride you go on.

Rides	0	1	2	3	4	5
Total Cost	$30.00	$31.50	$33.00	$34.50	$36.00	$37.50

a) What is the functional relationship between the two variables (algebraic expression)?

b) If you graphed the table of values, would the line be straight or curved? Explain.

c) How much would it cost if you went on 25 rides?

Part 3 Fill in the tables using the equations below

x	Y
1	10
2	16
3	22
4	
5	
6	

x	y
1	-1
2	2
3	5
4	
5	
9	

2) $y = 3x - 4$

x	y
1	
2	
3	
4	
5	
11	

3) $y = -2x + 4$

Part 4 Writ... equ...n that represents the relation between x and y

x	y
1	3
2	10
3	17
4	24
5	
6	

x	y
1	-8
2	
3	-1
4	
5	
9	

x	y
1	-4
2	-1
3	2
4	5

1)_____ 2)_____ 3)_____

Part 5 Make a table of values for each relation

1) $y = 2x + 3$

2) $y = 4x - 5$

3) $y = -3x + 3$

Part 6 Answer the questions below

1) Cameron went to an amusement park. He paid $22 to get in and then $3 per ride he went on.

a) Write a linear equation that represents the situation.

b) Fill in the table of values below.

c) Gra[illegible] the tab[illegible]es.

2) If Cameron wen[illegible]5 rid[illegible] much would it cost hi[illegible]

3) Cameron ended up paying $118 at the amusement park. How many rides did he go on?

4) Fill in the missing values in the ordered pairs below

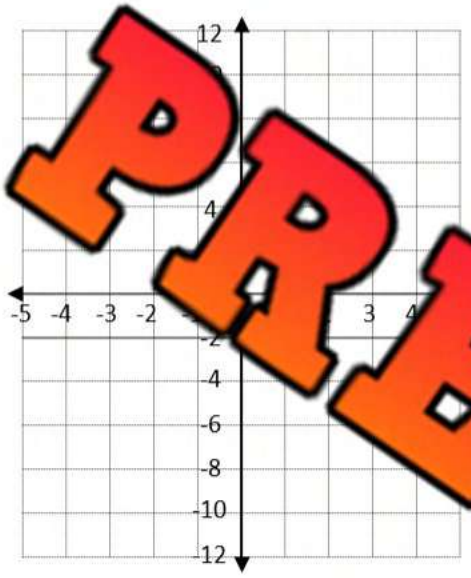
(18, _____), (35, _____), (110, _____)

(_____, 100), (_____, 136), (_____, 937)

Part 7 Fill in the table of values and then graph the results using ordered pairs

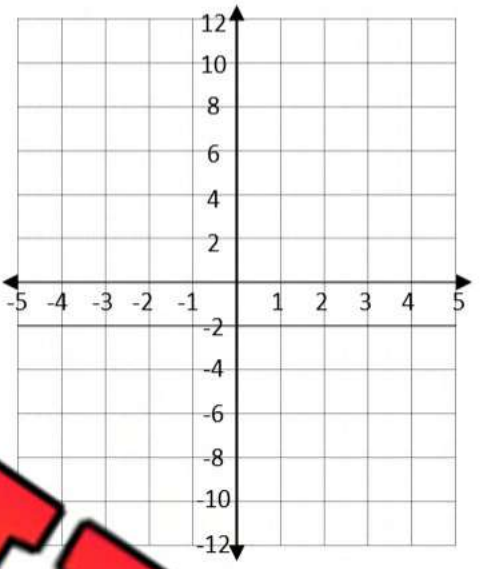
1) $y = -2x - 2$

x	0	1	2	3	4
y					



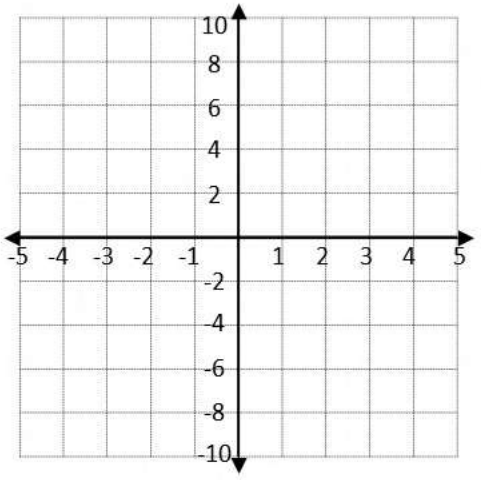
2) $y = -x + 4$

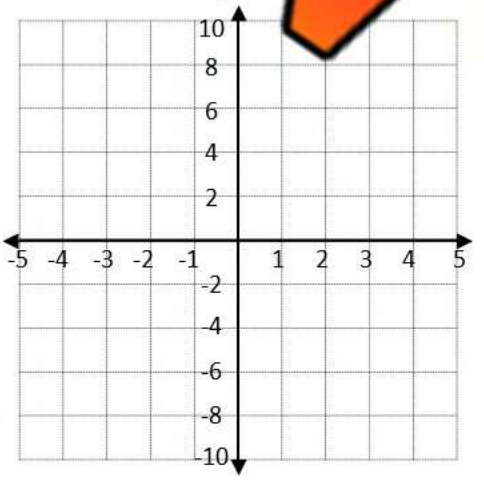
x	0	1	2	3	4
y					



Part 8 Graph the linear equations below. C[illegible] necessary

3) $y = -3x + 8$





Grade 8

Expressions and Equations

	Curriculum Expectations	Pages That Cover the Expectations
PE.2	Expressions- writing and evaluating using substitution	80 – 97
PE.3	Two-step equations with integer coefficients, constants, and solutions	98 - 169

Name: _____ 81

Curriculum Connection
PE.2

Equation or Expression?

Instructions Is the number sentence an expression or equation?

1) Paul has 5 cookies but needs enough for 10 people. $5 + c = 10$	Equation	Expression
2) The pa[illegible]s the following rule: $3n - 1$	Equation	Expression
3) Maria want[illegible]n th[illegible]week. She has already run 22km. $22 +$ [illegible]0	Equation	Expression
4) The cost to enter an a[illegible]t pa[illegible]ner ticket. $t20$	Equation	Expression
5) Jeff works at a garden centre and earns $15[illegible]lour. He can figure out his pay by using the follo[illegible]tion $15h$	[illegible]tion	Expression
6) Bailey made $200 last week working with her mom. She worked 10 hours. $10w = 200$	Eq[illegible]	[illegible]sion
7) Jane had 150 candies to give away on Halloween. She has 30 left. $150 - c = 30$	Equation	Expression
8) Ashley had 200 candies to give away on Halloween. She will give 2 candies to each kid. How many kids can she give candy to? $200 \div 2 = k$	Equation	Expression
9) Candy bags come in 30 packs. The total number of candies is represented below: $30b$	Equation	Expression

Name: _____ 85

Curriculum Connection
PE.2

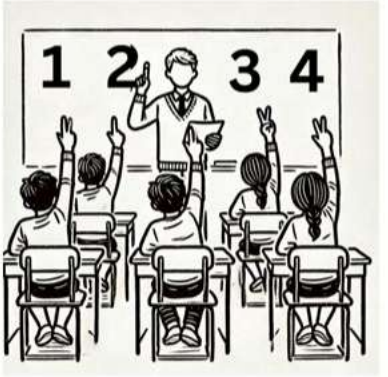
Finger Signals Quiz - Understanding Algebraic Expressions

Objective What are we learning about?

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

Materi ...u will need for the activity.

- A list of q...



Instructions How y... ...mple... ...ctivity

1. Prepare a list of questions with ...nswer... ...abeled A, B, C, and D.
2. Explain the finger signals for each ansv... ...ice: ... for A, two fingers for B, three fingers for C, and four fingers ... D.
3. Inform the students they will show their answer u... ...e fi... ...n... ...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: _____ 86

Curriculum Connection
PE.2

Question	A	B	C	D
A student reads r pages each day for 6 days. What is the total number of pages read?	6 + r	6 - r	6r	r ÷ 6
A photographer takes p photos, takes 4 more each day for 6 days, and then deletes 8. How many photos are there now?	p + (4 × 6)	(p + 24) - 8	p + 24	p + (4 x 6) - 8
A farmer has f cows, buys 18 more, and sells 7. How many cows are there now?	f + 18 – 7	f × 18 - 7	f + 18 + 7	f ÷ 18 - 7
A librarian shelved 40 books over the course of h hours. Wha[illegible] average number of books shelved per h[illegible]	40 + h	40 - h	40h	40 ÷ h
A farmer p[illegible] h row and has 6 rows. W[illegible] n[illegible] trees?	6 + f	6 - f	6f	f ÷ 6
A worker[illegible] w doll[illegible] for 7 hours. What is the total e[illegible]	7 + w	7 - w	7w	w ÷ 7
A library has b boo[illegible] more, a[illegible] loses 20. How many bo[illegible] there	b + 50 - 20	b × 50 - 20	b + 50 + 20	b ÷ 50 - 20
A factory produces p product[illegible] 10 days. What is the total productio[illegible]	[illegible]	10 - p	10p	p ÷ 10
A librarian has b books, receives 7 mo[illegible]ch hour for 8 hours, and then donates 10. How many books are there now?	[illegible] 8) - [illegible]	[illegible]56) - 10	b + (7 × 8)	b ÷ 7 x 8 - 10
A runner runs 40 kilometres over the course of d days.	40[illegible]	40[illegible]	40d	40 ÷ d
A school has s students but loses 20. What is the total number of students?	s + 20	[illegible]	[illegible]	s ÷ 20
A gardener has g plants, plants 5 more each day for 3 days, and then removes 4. How many plants are there now?	(g + 15) – 4	g + (5[illegible]) – 4	[illegible]	[illegible] × 3)
A chef cooked 120 meals over the course of m days. What is the average number of meals cooked per day?	120 + m	120 - m	120m	120 ÷ m
A baker makes b batches of cookies each day for 4 days. What is the total number of batches?	4 + b	4 - b	4b	b ÷ 4
Sarah has s apples and buys 5 more. How many apples does she have now?	s + 5	s - 5	5s	s ÷ 5
A store has k kites but sells 30. What is the total number of kites left?	k + 30	k - 30	30k	k ÷ 30
An artist has p paintings, paints 2 more each day for 5 days, and then sells 6. How many paintings are there now?	a + (2 × 5)	(a + 10) - 6	a + (2 x 5)	a + (2 x 5) - 6

Name: _____ 87

Curriculum Connection
PE.2

Distributive Property - Addition

The distributive property is used to make difficult problems simpler. It means that when we multiply a number by the sum of two or more addends, we get the same result as multiplying each addend separately by the number.

You can use the distributive property of multiplication to rewrite expressions that have a number outside of a parenthesis.

Example 1

7(5
7 x 5

7	5	3
	35	21

Example 2

4(y + 8)
4 x y + 4 x 8
4y + 32

4	y	8
	4y	32

Evaluate

Fill i del epresent the distributive property of the expressions.

1) 9(4 + 6)	2) 6(3 + *n*)
3) 8(7 + 3)	4) *n*)
5) 6(*f* + 11)	6) -3(5 + *p*)

Expand

Evaluate the expressions below.

1) 9(t + 7)	2) -2(8 + 12)	3) -6(x + 3)
4) 8(y + 4)	5) 5(-11 + *n*)	6) -4(-12 + *k*)

Name: _____ 88

Curriculum Connection
PE.2

Distributive Property - Subtraction

To subtract using the distributive property, we follow the same steps as with addition questions. If the number outside of the parenthesis is positive, we can simply distribute it to the numbers inside the parenthesis, as done in example 1.

In some situations, it may be easier to "add the opposite." This is especially true if the number outside of the parenthesis is negative, like in examples 2 and 3.

Exam
5(*y*
5*y*

Example 2
-4(*n* - 8)
-4*n* – (-4)(8)
-4*n* – (-32) or -4*n* + 32
-4*n* + 32

Example 3
-4(-*t* - 3)
-4(-*t*) – (-4)(3)
4t + 12

Part 1 Expand the expressions below.

1) 9(5 - 7)	2) 3(8 –	3) 7(*x* - 6)
4) 8(*y* - 4)	5) 5(1	6) 4(11 - *k*)
7) 10(*b* – 6)	8) 8(11 – *c*)	9) 6(*m*

Part 2 Expand the expressions below.

1) -3(5 - *t*)	2) -7(*n* - 4)	3) 8(*x* - 7)
4) -4(*y* - 8)	5) -6(12 - *n*)	6) -4(10 - *k*)
7) 10(*k* – 8)	8) -7(9 – *c*)	9) -5(*m* – 12)

Name: _____ 89

Curriculum Connection
PE.2

Distributive Property – Equivalent Expressions

Match Write the letter from column 2 beside the equivalent expression from column 1.

1

Answer	Column 1	Letter	Column 2
	3(9 – 5)	a	15 + 27
	-3(9 + 5)	b	(-15) + 27
	3(5 + 9)	c	3 x 9 – 3 x 5
	-3(5 - 9)	d	(-27) + (-15)

2

Answer	Colu	Letter	Column 2
		a	-63 - 7t
		b	7t + 63
	7(t +)		-7t + 63
	-7(t - 9)		63 - 7t

3

Answer	Column 1	Lett	n 2
	8(11 – n)	a	
	-8(n + 11)	b	
	8(11 + n)	c	-8 8
	-8(11 - n)	d	88 + 8n

4

Answer	Column 1	Letter	Column 2
	3(y – 5)	a	3y + 15
	-3(y + 5)	b	-3y + 15
	3(y + 5)	c	3y - 15
	-3(y - 5)	d	-3y - 15

Name: _____ 92

Curriculum Connection
PE.2

Evaluating Algebraic Expressions - Subtraction

Subtraction Integers Rules

To subtract integers, it is easiest to change the operation to addition and then follow the addition rules. We can do this by using the rule – Keep, Flip, Change. We keep the first number the same, flip the operation from subtraction to addition, and then change the third number's sign.

Example: 5 – (-6) = ? becomes 5 + 6 = 11

Keep the first integer

Flip the operation

Change the sign of the next integer

Part 1

Eva[illegible]tow[illegible]pressions for x = -8

1) x - 15	2) [illegible]	3) 27 - x	4) x - 31
5) 47 - x	6) 61 - x	7) [illegible] - 16	8) 94 - x - 14

Part 2

Evaluate the following expressions for y = -12 and n = -5

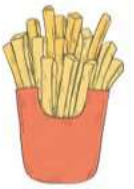
1) y - n	2) (16 - n) - y	3) 15 – (y - n)	4) y - 11 - n
5) 21 - y - n	6) (n – y) - 36	7) y – (n – 43)	8) (28 – n) - y

Name: _____ 93

Curriculum Connection
PE.2

Evaluating Expressions – Food Truck

Walker works at a food truck selling burgers, hot dogs, fries, and pogos. He uses algebraic expressions to determine the cost of his customer's orders.



Menu	
Burger (b)	$4.50
Hot Dog (h)	$2.75
Fries (f)	$3.25
Pogo (p)	$3.50

Solve Write t… …aic expression and then evaluate using the menu prices.

Customer Orde…	Expression	Answer
1) 2 burgers, 1 fry	2 x b + f …0 + 3.25	
2) 4 hot dogs, 2 pogos		
3) 5 fries, 2 pogos		
4) 3 burgers, 2 fries, 2 pogos		
5) 3 fries, 5 burgers, 4 hot dogs		
6) 10 burgers, 10 fries		
7) 5 hot dogs, 7 fries, 3 pogos		
8) 4 burgers, 9 hot dogs		

Name: _____ 95

Curriculum Connection
PE.2

Evaluating Algebraic Expressions – (x ÷)

Part 1 Evaluate for x = -3. Use brackets to separate the numbers.

1) $7x$	2) $6x$	3) $4x - 5$	4) $12x + 7$
5) $17x$	6) $15x - 10$	7) $8x - x$	8) $13x + 6 - x$

Part 2 Evaluate the following expressions for y = -8

1) $\frac{y}{2}$	2) $\frac{32}{y}$		4) $\frac{y}{2} + 5$
5) $\frac{48}{y} + 7$	6) $\frac{88}{y} + y$	7) $\frac{0}{y}$	x y

Challenge! Use three -5s and any operation or brackets to write an expression with the values provided.

	Your Expressions	Value
1)		-125
2)		-5
3)		0
4)		50

	Your Expressions	Value
5)		5
6)		30
7)		20
8)		-6

Name: _____ 96

Curriculum Connection
PE.2

Representing Situations - Division

Part 1 Solve the expressions below using n = 6 and y = 3

	Expression	Answer
1)	$(7 + 11) \div y$	
2)	$\frac{(n + 3)}{}$	
3)		
4)	12	

	Expression	Answer
5)	$\frac{(n + y + 6)}{y}$	
6)	$8 + \frac{(5n - 6)}{y}$	
7)	$\frac{n}{y}$	
8)	$\frac{(11 + 4)}{y}$	

Part 2 Write an exp si th le in brackets to represent the situations.

1) Gianna and her friends sold brac celet. They divided the earnings up equally amongst her (f) friend

a) Write an expression that represents t situation

b) If Gianna worked with 2 other friends, how mu uld

2) Zoey made 3 trays of cookies with 12 cookies on each t he up equally between (n) number of friends.

a) Write an expression that represents the situation.

b) If Zoey split the cookies with 8 friends, how much would each friend get?

3) Mrs. Hubert has 8 packs of pencil crayons that have 12 crayons inside each pack. She divides the pencil crayons into (g) number of groups.

a) Write an expression that represents the situation.

b) If Mrs. Hubert gave 6 crayons to each group, how many groups did she give to?

Name: _____ 97

Curriculum Connection
PE.2

Evaluating Expressions - BEDMAS

Part 1 Evaluate the following expressions for t = 6

1) $t + 16 \times 2$	2) $10t - (t + 4)$	3) $63 - (t)\frac{t}{3}$	4) $4t \div (2 + 10)$
5) $4t \div$	6) $12 + \frac{2t}{3} - 5$	7) $\frac{4t - t}{3}$	8) $18 + t \div 3$

Part 2 Evaluate the following expressions for y = -8 and n = 2

1) $y + n \div (-2)$	2) $6n$ –	$(2n - 6)$	4) $y \div (-2 - n)$
5) $4n + 40 \div y$	6) $\frac{24n}{y} + 12$	7)	(15 + n)(y)

Part 3 Evaluate the following expressions for x = -10 and p = -5

1) $2x(p + 5)$	2) $4x + (2p - x)$	3) $(-25) - (x)(p)$
4) $90 \div (p + -5x)$	5) $22 + 8x - (p + 5)$	6) $12 - \frac{5x}{p} + 5p$

Name: _____ 101

Curriculum Connection
PE.3

Matching Game: Do The Equations Match?

Objective What are we learning about?

To enhance students' understanding of equivalent equations. Students will identify and match pairs of equations that yield the same result, fostering critical thinking and prob lving skills in a collaborative group setting.

Mat W you need for the activity?

- Pre-prepar re-c g cards.
- Small bags or envel ld t ts for each group

Instructions How will you complete the a ?

1. Before the class, the teacher will cut out the p ed m ng game cards.
2. Divide the students into small groups and give each group ag elope containing a set of the matching cards.
3. In their groups, students will spread out the cards face down on their table.
4. 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).
5. 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.
6. The activity continues until all pairs are correctly matched within each group.

Name: _____ 104

Curriculum Connection
PE.3

Cards | Matching Game Cards

71 + (–26)	155 – 110
328 + [illegible] 10	313 – (–10)
160 – 75 – 30	1[illegible] + [illegible]20) – 25
–73 + 145	192 – 1[illegible]0
102 – 28 + 17	147 + (–19) – 37

Name: _____ 105

Curriculum Connection
PE.3

Cards | Matching Game Cards

$98 + (-43)$	$75 + 20 - 40$
$-67 - 25$	$290 - 99$
$89 - 49 + 18$	$6 \quad 12 + 14$
$-83 + 249$	$199 + (-66) + 33$
$77 - 25 + 12$	$40 + 24 - 0$

Name: _____ 107

Curriculum Connection
PE.3

Addition Equations – Golf Tournament - Challenge

Zack hosted a 4-round golf tournament. He has the results and needs to find out who won the tournament. The leaderboard is below but is missing numbers.

Directions Fill in the leaderboard.

Player	Round 1	Round 2	Round 3	Round 4	Final Score
Ri		-6	4	-5	
Charlie		-2	5		-5
Dominic				9	-6
Kayden	-3	-7	-1	-5	
Silas	5	3			-1
Lillian	5	8			9
Brooklyn	-4	-2			-5
Natalie		7	2	-6	-4
Andrew	-5	4	1		
Santiago		-3	-8		-22

Results Who won the golf tournament?

1) Who won the golf tournament?	
2) The entry fee for the tournament was $75. All the money went to the prize (p). Write an equation that determines the value for (p).	
3) More golfers joined the tournament. The prize ended up being $1125. Write an equation that determines how many golfers (g) participated in the tournament.	

Name: _____ 108

Curriculum Connection
PE.3

Integer Patterns – Average Temperatures

Directions Answer the questions below.

6 friends participated in a 4-round golf tournament. The table below shows what each friend scored.

Player	Round 1	Round 2	Round 3	Round 4	Final Score
Kylie (	-3	-5	+4	-4	
Finn	-3	+2	+5	-6	
M		-3	+1	+7	
Daws (*d*)		-9	-2	-4	
Zayn (*z*)			-8	+5	
Leon (*l*)			-6	+4	

a) Fill in their final sco

b) Write an equation that sh s th etween Finn's (*f*) final score and Zayn's (*z*) final score. e vari efore you solve.

c) Suppose Kylie and Maggie played on a te gai nn. Write an equation that shows the difference between t a score

d) Suppose Dawson and Zayn were on a team against Leon a M rite an equation that shows the difference between their team scores.

e) Suppose Kylie, Finn, and Maggie played on a team against Dawson, Zayn, and Leon. Write an equation that shows the difference between their team scores.

f) Use the variables *b* for best round and *w* for worst round to write an equation that finds the difference between the best and worst players.

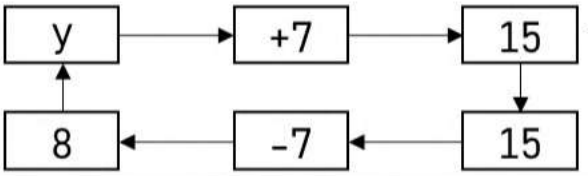
Name: _____ 109

Curriculum Connection
PE.3

Adding and Subtracting Equations – Flow Chart

We can use a reverse flow chart to calculate the value of a variable in an equation.

Example: $y + 7 = 15$



- Equation represented the same

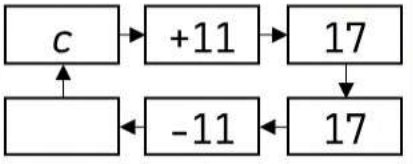
- Use the opposite operation in the middle and solve for the last box

Direction Use the flow chart to find the value of the variable.

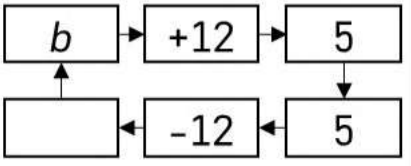
1) $t - 7 = 12$

2) $r - 9 = 16$

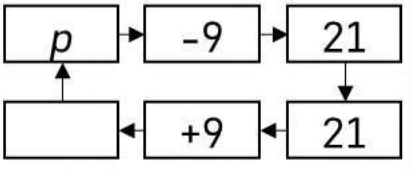
3) $c + 11 = 17$



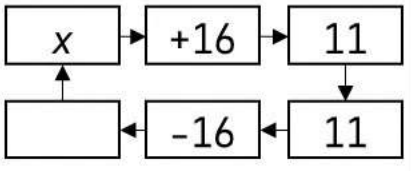
4) $b + 12 = 5$



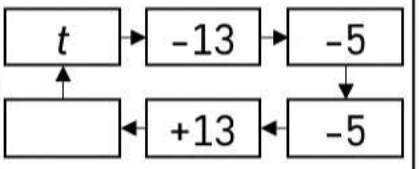
5) $p - 9 = 21$



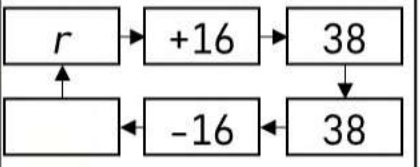
6) $x + 16 = 11$



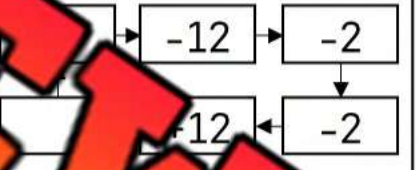
7) $t - 13 = -5$



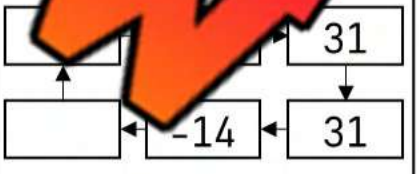
8) $r + 16 = 38$



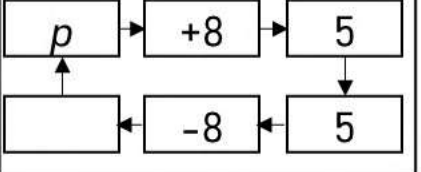
9) $c - 12 = -2$



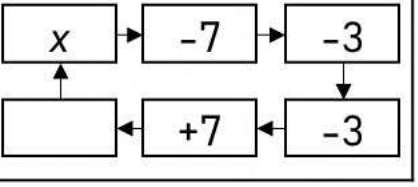
10) $b + 14 = 31$



11) $p + 8 = 5$



12) $x - 7 = -3$

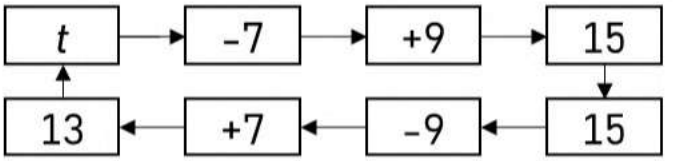
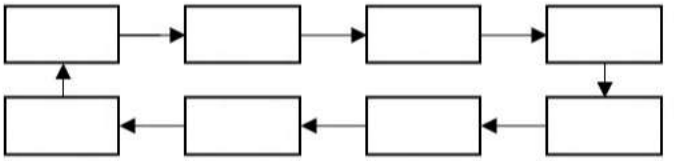
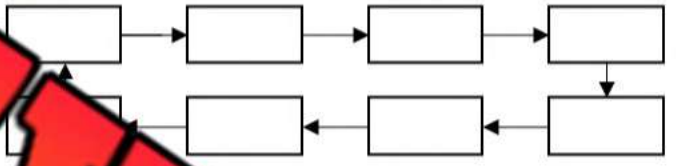
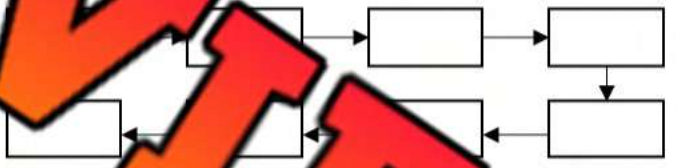
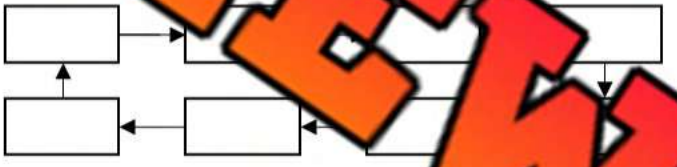
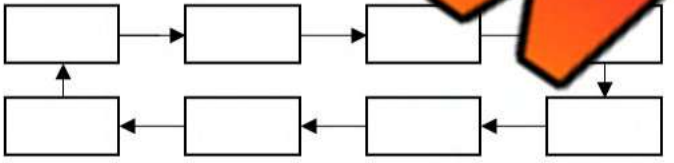
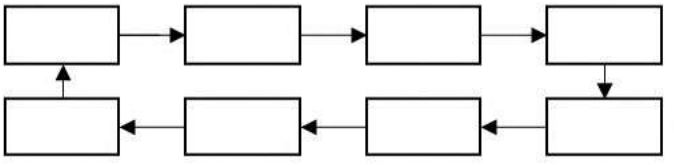
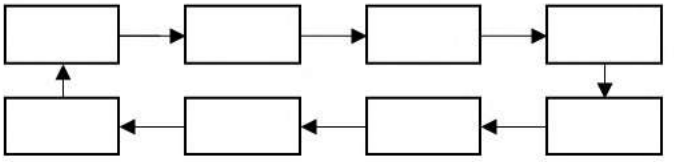


Name: _____ 111

Curriculum Connection
PE.3

Adding and Subtracting Equations – Flow Chart

Directions Fill in the blanks in the flow chart.

1) $t - 7 + 9 = 15$	
2) r	
3) $c + 7 - 14 = 1$	
4) $b - 11 + 7 = -5$	
5) $p - 5 + 13 = 2$	
6) $c + 16 - 13 = -4$	
7) $b + 11 + 6 = 15$	
8) $p - 9 - 15 = -13$	

Name: _____ 112

Curriculum Connection
PE.3

Are They Equal - x ÷

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

6 x (-3) ≠ 18 (-3) x 8 = 24 $\frac{42}{-6} \neq 7$

Part 1 Put a slash through the equal sign (≠) if it is not balanced.

1) [illegible]	2) (-8) x 4 = 32	3) (-8) x (-3) = 24
4) $\frac{50}{10}$ = [illegible]	[illegible] $\frac{36}{9}$ = (-4)	6) $\frac{48}{-8}$ = 6
7) 8 x (-7) = 56	8) [illegible]	9) $\frac{64}{-8}$ = -8
10) $\frac{-42}{-6}$ = 7	11) $\frac{77}{7}$ = [illegible]	[illegible] (-4) x 9 = (-36)

Part 2 Fill in the missing number to balanc[illegible]uatio[illegible]

1) (-6) x 7 = ☐	2) 12 x (-4) = ☐	3) (-8) x ☐
4) ☐ ÷ 12 = 7	5) ☐ ÷ (-5) = 9	6) ☐ ÷ (-11) = 7
7) 6 x ☐ = (-78)	8) ☐ x (-4) = 32	9) (-12) x ☐ = 48
10) 63 ÷ (-7) = ☐	11) 96 ÷ ☐ = (-12)	12) ☐ ÷ (-6) = (-9)

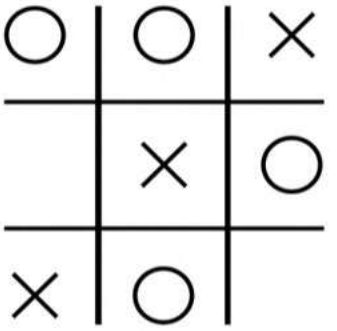
Name: _____ 114

Curriculum Connection
PE.3

Math Tic-Tac-Toe: Balance The Equations

Objective — What are we learning about?

To help students practice solving and balancing equations involving variables in a fun and interactive way thro[illegible] Tic-Tac-Toe game.



Mate[illegible] — W[illegible]ll you need for the activity?

- Tic-Tac-T[illegible] [illegible]oards [illegible]ided

Instructions — How wi[illegible]s[illegible]aplet[illegible]ivity?

1. Find a partner to play the game[illegible]
2. The goal is to solve and balance the alg[illegible] equ[illegible]s[illegible]ch square to 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 t[illegible]s[illegible] find 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, and diagonally) wins the game. Continue playing with different tic-tac-toe grids on the sheet.

Name: _____ 116

Curriculum Connection
PE.3

Tic-Tac-Toe

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

96 ÷ ___ = 16	(-12) x ___ = 60	___ ÷ 6 = 12
(-42) x ___ = 84	48 ÷ (-8) = ___	___ x 5 = 35
180 ÷ ___ = (	x (-4) = ___	___ ÷ 9 = (-9)

128 ÷ ___ = 16	(-18) x ___ = 72	___ ÷ 4 = 8
(-36) x ___ = 108	75 ÷ (-15) = ___	___ x 6 = 36
110 ÷ ___ = (-11)	(-25) x (-8) = ___	___ ÷ 10 = (-6)

192 ÷ ___ = 16	(-24 = 48	÷
(-30) x ___ = 90	54 ÷ (-6) = ___	___ x 12 =
200 ÷___ = (-10)	(-44) x (-3) =___	___÷ 2 = (-10)

72 ÷ ___ = 9	(-15) x ___ = 60	__ ÷ 4 = 10
(-22) x	80 ÷ (-8) = ___	___ x 14 = 98
135	32) x (	___ ÷ 6 = (-5)

48 ÷ ___ = 8	(-21) x ___ = 105	___ ÷ 7 = 9
(-16) x ___ = 48	60 ÷ (-10) = ___	___ x 11 = 88
72 ÷ ___ = (-6)	(-40) x (-4) = ___	___ ÷ 3 = (-8)

64 ÷ ___ = 16	(-20) x ___	___ ÷ 8 = 5
(-28) x ___ = 56	100 ÷ (-25) = ___	___ x 7 = 28
90 ÷ ___ = (-9)	(-36) x (-2) = ___	___ ÷ 12 = (-6)

Name: _____ 117

Curriculum Connection
PE.3

Finding The Value of a Variable

When we multiply a number by a variable, we do not need to use the multiplication sign. It is known that any variable next to a number means the operation we are using is multiplication.
Example: 7n = 14 means 7 x n = 14
We can figure out the unknown number by balancing the equation: n = 2.

Part 1 Find out the value of the variable.

1) [illegible]	2) (-4n) = 16 n =	3) (-9s) = 54 s =
4) [illegible] x (-4) p	5) $\frac{-77}{p}$ = -11 p =	6) $\frac{-28}{k}$ = -7 k =
7) (-3n) = (-1[illegible] n =	[illegible] (-42)	9) $\frac{n}{8}$ = -9 n =
10) $\frac{-40}{5}$ = n n =	11) [illegible]	12) $\frac{p}{15}$ = -5 p =
13) (-8n) = 96 n =	14) $\frac{110}{n}$ = n =	15) 7d = 56 d =

Part 2 Calculate the area of a circle and a triangle [illegible] the [illegible]ow.

The formula for calculating the area of a circle is: A = [illegible] = ~3.14
Calculate the area in the questions below using the values for radius and pi

	Radius	Area - Circle
1)	r = 9cm	A =
2)	r = 6cm	A =

	Radius	Area - Circle
3)	r = 12cm	A =
4)	r = 7cm	A =

	Radius	Area - Circle
5)	r = 13cm	A =
6)	r = 11cm	A =

The formula for calculating the area of a triangle is: A = $\frac{(b)(h)}{2}$

	b	h	Area - Triangle
1)	6	2	A =
2)	9	6	A =

	b	h	Area - Triangle
3)	8	4	A =
4)	7	5	A =

	b	h	Area - Triangle
5)	3	4	A =
6)	8	6	A =

Name: _____ 118

Curriculum Connection
PE.3

Writing Multiplication Equations – Gas Station

Tyler works at a gas station. He sells fuel by the litre, chips, drinks, and chocolate bars.

Fuel (f)	Chips (c)	Drinks (d)	Chocolate Bars (b)
$1.33/L 	$1.75 	$1.25 	$1.99 

Instructi Complete the table below. The first one is done for you.

#	f	C	d	b	Equation	Answer
1	20	2		0	20f + 2c	t = 20 x 1.33 + 2 x 1.75 t = 26.6 + 3.50 t = $30.1
2	50	0	3	2		
3	0	2	1	0		
4	60	1	2	2		
5	0	2	0	0		
6	0	1	1	0		
7	25	2	1	2		
8	70	0	1	3		

Name: _____ 123

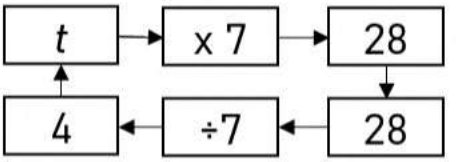
Curriculum Connection
PE.3

Multiplying Equations – Flow Chart

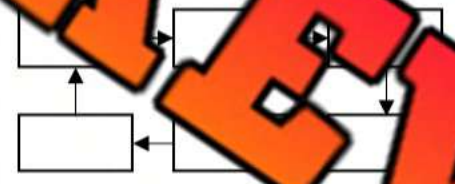
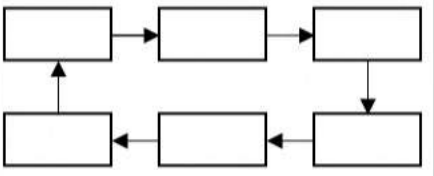
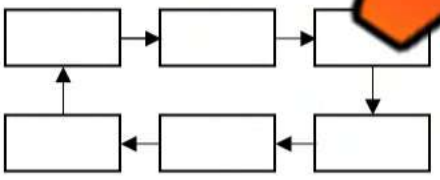
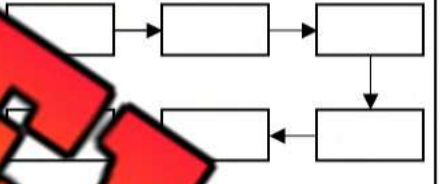
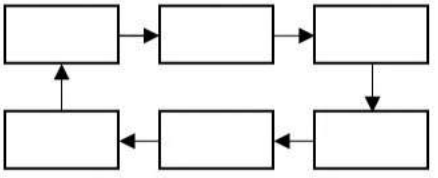
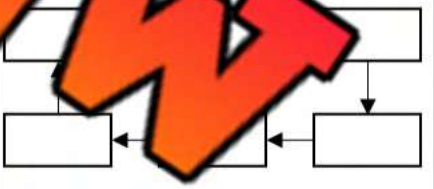
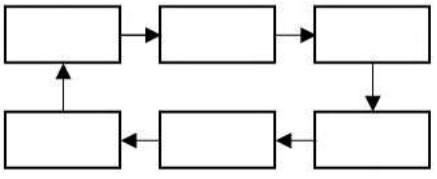
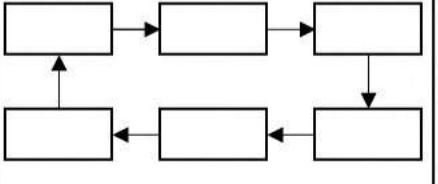
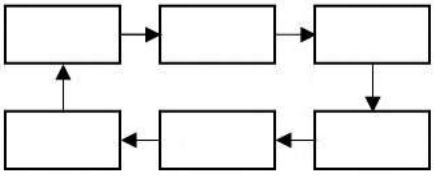
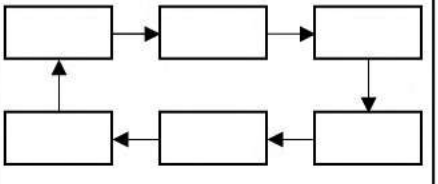
Steps to fill in a flow chart:

1) Write the variable in the first box
2) Write the second value in the second box
3) Write the answer in the third box
4) We are working in reverse now. Write the answer in the first box
5) We d[illegible] opposite to the next box as we did with the second box
6) Fill i[illegible]t box to find the value of the variable, which it points to

Example: $7t = 28$



Direc[illegible] [illegible]he blanks in the flow chart.

1) $7t = 28$		$12t = -84$	
2) $3r = 15$		[illegible] $= -55$	
3) $-9c = 36$		8) $-7c = 63$	
4) $-6b = -42$		9) $-12b = -132$	
5) $8p = -72$		10) $-9n = 63$	

Name: _____ 125

Curriculum Connection
PE.3

Writing Division Equations - Sharing

Mark is the best boss! Every week, he brings in treats for his 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	18 donuts (d)	6	$\frac{d}{s}$ = t	$\frac{18}{6}$ = 3
2	16 cookies (c)	2	$\frac{c}{s}$ = t	$\frac{12}{6}$ = 2
3	28 muffins (m)	4		
4	88 slices of pizza (p)	22		
5	56 bagels (b)	7		
6	48 donuts (d)	12		
7	12 cookies (c)	4		
8	72 muffins (m)	9		
9	25 pastries (p)	10		
10	50 cookies (c)	20		
11	64 slices of pizza (p)	8		
12	30 bagels (b)	20		
13	75 muffins (m)	50		

Name: _____ 126

Curriculum Connection
PE.3

Writing Division Equations - Investments

An investment club is a group of investors who pool their money to make investments. Each member of the group helps study new investment opportunities. When an investment earns money, they split the earnings. When an investment loses money, they split the losses.

Instructions Use a formula to find out the balance for each person in the club.

#	Investment (i)	# of People in the Club (n)	Formula	Answer
1	$400 loss	8	$\frac{i}{n}$ = t	$\frac{-400}{8}$ = -50
2	$600 gain			
3	$800 loss	5		
4	$1200 loss	8		
5	$ 750 gain	5		
6	$5000 gain	20		
7	$2500 loss	25		
8	$3600 loss	24		
9	$12500 gain	5		
10	$8000 gain	40		
11	$6800 loss	17		
12	$25000 loss	20		
13	$84000 gain	16		

Name: _____ 127

Curriculum Connection
PE.3

Division Equations – Flow Chart

Directions Fill in the blanks in the flow chart.

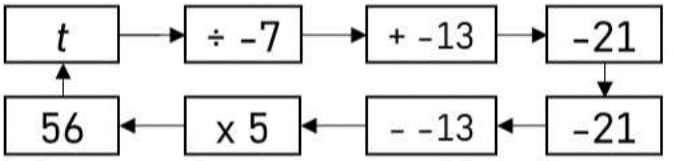
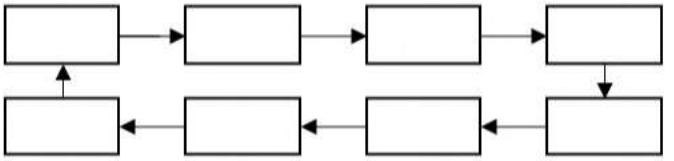
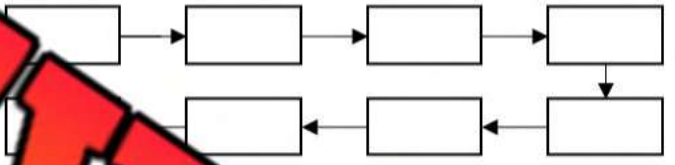
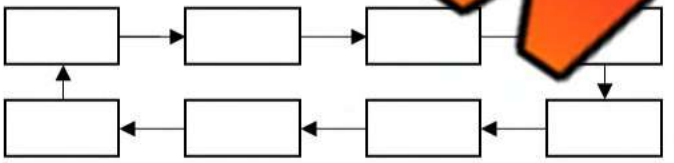
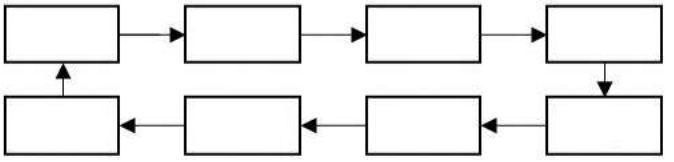
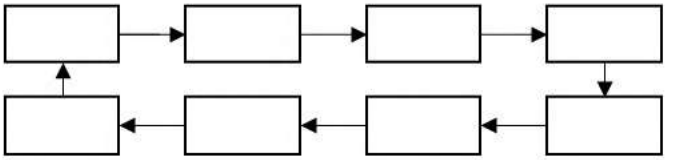
1) $\frac{t}{-6} = 4$	t → ÷ -6 → 4 -24 ← x -6 ← 4	7) $\frac{t}{8} = -4$	
2) $\frac{r}{-7} = 8$		8) $\frac{r}{-12} = 9$	
3) $\frac{c}{4} = -7$		9) $\frac{c}{-6}$	
4) $\frac{b}{11} = 6$		10) $\frac{b}{-15} = 4$	
5) $\frac{p}{-7} = -12$		11) $\frac{p}{8} = 12$	
6) $\frac{n}{-2} = -33$		12) $\frac{n}{-13} = -6$	

Name: _____ 128

Curriculum Connection
PE.3

Division Equations – Flow Chart

Directions Fill in the blanks in the flow chart.

1) $\frac{t}{-7} + -13 = -21$	
2) $\frac{r}{}$	
3) $\frac{c}{-9} + (-6) = 1$	
4) $\frac{b}{8} - 5 = 8$	
5) $\frac{p}{-6} - 7 = -2$	
6) $\frac{n}{-7} + (-17) = -6$	
7) $\frac{t}{12} - 6 = -11$	
8) $\frac{r}{-9} + 9 = 17$	

Name: _____ 130

Curriculum Connection
PE.3

Evaluating Equations

Instructions Evaluate the equations below

1) $x = 9 + 14 - 5$

2) $x = 7 \times 4 - 11$

3) x [illegible] 5

4) $x = 25 - 4 \times 3$

5) $x = 6 + 5 - 5 \times 3$

6) [illegible] + 3 - 23

7) $x = 8 \times 5 \div (-2)$

8) $x = (2 - 5)$ [illegible]

9) $x = 24 \div 6 \times (-5)$

10) $x = 61 - 6 + (-15)$

Name: _____ 132

Curriculum Connection
PE.3

Evaluating Equations – Isolating The Variable

Steps to isolate a variable:

1. Add or subtract the same amount from both sides so that the variable is by itself
2. If the number that is with the variable is positive, you will subtract the same number from both sides.
3. If it is negative, you will add the number to both sides.
4. Leave your answer with the variable on the left (examples 2/3)

Example 2

$15 = x + 9$

$15 - 9 = x + 9 - 9$

$6 = x$

$x = 6$

Example 3

$-34 = 6x - 4$

$-34 + 4 = 6x - 4$

$\frac{-30}{6} = \frac{6x}{6}$

$-5 = x$

$x = -5$

Instructions Ev ation below

1) $x - 5 = 15$

$x + 17 = 31$

3) $x + 12 = 25$

4)

5) $9 = x + 13$

6) $24 = x - 15$

7) $x + 32 = 25$

8) $48 = x + 56$

Name: _____ 133

Curriculum Connection
PE.3

Evaluating Equations – Isolating The Variable

Instructions Evaluate the equations below

1) $(-6) + x = 3$

2) $x - 7 = -4$

3) $x - [illegible] = -5$

4) $(-7) + x = 15 - 7$

5) $14 + x = 11 \times 4 - 5$

6) [illegible]

7) $x + 6 = 6 \times (-2)$

8) $x + (3 \times 4) = 60 \div (-10)$

Name: _____ 137

Curriculum Connection
PE.3

Representing Linear Equations (ax = b)

Instructions Write a pictorial representation of the linear equations provided

#	Linear Equation ($ax = b$)	Pictorial Representation
Ex)	$4x = 28$ $x = 7$	(7) (7) (7) (7) = (28) 4 groups of 7 = 28
1)	$5x$	
2)	$7x =$ $x =$	
3)	$9x = 72$ $x =$	
4)	$8x = 96$ $x =$	
5)	$2x = 144$ $x =$	
6)	$6x = 84$ $x =$	
7)	$4x = 64$ $x =$	

Name: _____ 138

Curriculum Connection
PE.3

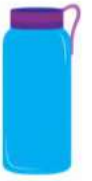
Representing Problems with Linear Equations (ax = b)

Instructions Represent the problems with linear equations (ax = b) and solve for x

1) Gianna drove 110km per hour for many hours to get to her cottage that is 770km away. How many hours did she drive for?

Linear equation: $x =$

2) S… full bottles of water each day. She drinks a total of 4500mL of …os… s. How many mL are in her bottle?



L… quati… $x =$

3) Avery ran 7 laps a… he neigh… d. She ended up running 4200m in total. What is the distance … ar… ghbourhood?

Linear equation:

4) Mason just finished a video game he had ju… … … ryday for 10 days. He played for a total of 1250 minutes. Ho… …inutes… play each day?

Linear equation: $x =$

5) Levi finished recording 6 songs with his band. It took them 174 minutes to record all 6 songs. On average, how many minutes did it take them to record each song?

Linear equation: $x =$

6) Owen types 32 words per minute. He typed an essay that was 256 words long. How many minutes did it take him to type the essay?

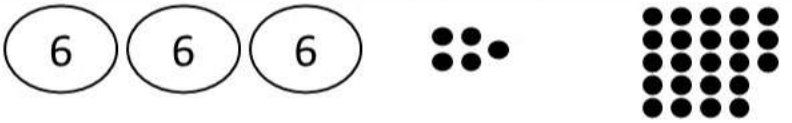
Linear equation: $x =$

Name: _____ 140

Curriculum Connection
PE.3

Representing Linear Equations (ax + b = c)

Instructions Write a pictorial representation of the linear equation provided

#	Linear Equation	Pictorial Representation
Ex)	$3x + 5 = 23$ $x = 6$	 3 groups of 6 + 5 = 23
1)	$3x +$	
2)	$8x + 9$ = 9 $x =$	
3)	$5x + 8 = 43$ $x =$	
4)	$7x + 8 = 50$ $x =$	
5)	$2x + 12 = 42$ $x =$	
6)	$4x + 22 = 66$ $x =$	
7)	$8x + 15 = 79$ $x =$	

Name: _____ 141

Curriculum Connection
PE.3

Representing Problems with Linear Equations (ax + b = c)

Instructions Represent the problems with linear equations (ax + b = c) and solve for x

1) Dylan went to an arcade. He had to pay for each game he played. He ended up playing 8 games. He also had to pay $12 to enter the arcade. In total, it cost him $36 at the arcade. How much does each game cost?

Linear equation: $x =$

2) For babysitting, Ashley charges a fee of $10, plus $4 per hour. Ashley earned $46 babysitting. How long did she babysit for?

Linear equation: $x =$

3) Riley has $30 saved to buy a new coat. She is able to save $7 a week from her allowance. How many weeks will it be until she has the $128 she needs for her new coat?

Linear equation: $x =$

Exit Cards

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

Name: _____

Represe[illegible]e problems with linear equation[illegible]b = c) and solve for x.

A c[illegible]arges a flat fee o[illegible] plus [illegible]r for renting a car[illegible]cos[illegible] renting the ca[illegible]0, for many hours did t[illegible]stor[illegible] car?

Name: _____

Represent the problems with linear equations (ax + b = c) and solve for x.

A car rental company charges a flat fee of $25 plus $5 per hour for renting a car. If the total cost for renting the car was $60, for how many hours did the customer rent the car?

Name: _____

Represent the problems with linear equations (ax + b = c) and solve for x.

A car rental company charges a flat fee of $25 plus $5 per hour for renting a car. If the total cost for renting the car was $60, for how many hours did the customer rent the car?

Name: _____

Represent the pro[illegible]ear equations (ax + b = c) a[illegible]e for x.

A car rental company charges a flat fee of $25 plus $5 per hour for renting a car. If the total cost for renting the car was $60, for how many hours did the customer rent the car?

Name: _____ 145

Curriculum Connection
PE.3

Solving Linear Equations (ax=b, ax+b=c)

Instructions Solve the linear equations below by determining the value of x

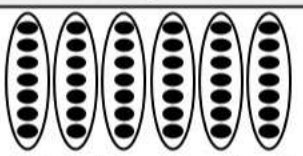
1) $8x = 56$ $x =$	2) $6x + 8 = 50$ $x =$	3) $9x + 11 = 83$ $x =$
4) [illegible] $x =$	5) $4x + 17 = 45$ $x =$	6) $8x + 15 = 71$ $x =$
7) $11x = 55$ $x =$	8) [illegible] $x =$	9) $9x = 108$ $x =$
10) $15x + 40 = 115$ $x =$	11) $7x + 31 = 94$ $x =$	12) [illegible] $= 110$ $x =$
13) $16x = 96$ $x =$	14) $11x + 60 = 115$ $x =$	15) $12x + 42 = 126$ $x =$
16) $25x + 70 = 245$ $x =$	17) $14x + 25 = 123$ $x =$	18) $100x = 1200$ $x =$

Name: _____ 146

Curriculum Connection
PE.3

Representing Linear Equations (x/a = b)

Instructions Write a pictorial representation of the linear equations provided

#	Linear Equation	Pictorial Representation	Verification
Ex)	$\frac{x}{6} = 7$ $x = 42$	 42 divided by 6 = 7	$\frac{42}{6} = 7$ ✓
1)	$\frac{x}{3} = 8$ $x =$		
2)	$\frac{x}{5} = 6$ $x =$		
3)	$\frac{x}{8} = 9$ $x =$		
4)	$\frac{x}{7} = 11$ $x =$		
5)	$\frac{x}{6} = 7$ $x =$		
6)	$\frac{x}{4} = 12$ $x =$		
7)	$\frac{x}{3} = 15$ $x =$		

Name: _____ 147

Curriculum Connection
PE.3

Representing Problems with Linear Equations (x/a = b)

Questions Represent the problems with linear equations ($\frac{x}{a}$ = b) and solve for x

1) Mya is having a party with 95 guests. She is serving soda to drink. She bought enough soda for each guest to have 3. How many sodas did she buy?

Linear equation: x =

2) Pa[illegible]e money today cutting grass in her neighbourhood. She charges [illegible] cuts and she cut 7 yards. How much money did she earn to[illegible]?

Li[illegible]uatio[illegible] x =

3) Neill collected a bu[illegible] candy aft[illegible] trick-or-treating for Halloween. He divided his candy equa[illegible]en [illegible]e [illegible]is 3 other brothers. Each person got 24 candies. How many can[illegible]s did [illegible]?

Linear equation: [illegible] =

4) Amelia is in a running challenge. She will co[illegible]et[illegible] [illegible]a[illegible]e [illegible]eeds to run over 6 days. Each day she will run 12km. How m[illegible] [illegible]al [illegible]m doe[illegible] [illegible]need to run for the challenge?

Linear equation: x =

5) Connor is one of the best 3-point shooters around. Each week, he takes a certain amount of 3-point shots during practice. He practices 6 days a week and takes 85 shots per session. How many shots in total does he take for the week?

Linear equation: x =

6) Hani has to do a bunch of push-ups for a fitness challenge. He divides the pushups into 8 sets of 25. How many total pushups does he need to do for the challenge?

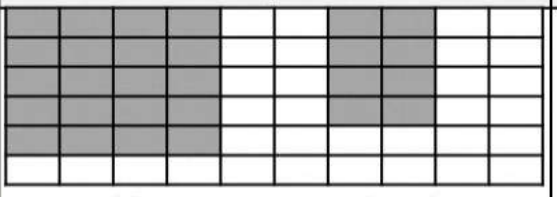
Linear equation: x =

Name: _____ 150

Curriculum Connection
PE.3

Representing Linear Equations (x/a + b = c)

Instructions Write a pictorial representation of the linear equations provided

#	Linear Equation	Pictorial Representation	Verification
Ex)	$\frac{x}{4}$ + 8 = 13 20	 20 divided by 4 + 8 = 13	$\frac{20}{4}$ + 8 = 13 ✓
1)	+ 6 =		
2)	$\frac{x}{5}$ + 10 = 13 x =		
3)	$\frac{x}{8}$ + 5 = 9 x =		
4)	$\frac{x}{7}$ + 15 = 17 x =		
5)	$\frac{x}{6}$ + 14 = 18 x =		
6)	$\frac{x}{4}$ + 12 = 19 x =		

Name: _____ 151

Curriculum Connection
PE.3

Representing Linear Equations (x/a + b = c)

Directions Represent the problems with linear equations (x/a + b = c) and solve for x

1) Ivy's teacher had a box of pencils to give out to the class. Each of the 30 students in the class received 3 pencils. Ivy also brought 8 pencils from home and now she has 11 pencils. How many pencils did Ivy's teacher have in the box?

ar equation: x =

2) oup of 5 arned some money today selling bracelets. Leah took home $ and ac e $95 she already had, which means she now has $135. How much d ea tal?

Linear equ x =

3) Hailey made spaghetti and meat her f She made enough meatballs for 6 of her friends to have 7 ea e frien xtra meatballs from home. That friend now has 10 meatballs. H any m s did Hailey make?

Linear equation:

4) A group of 6 friends drove to Ottawa to see the Parliament E end drove 120km. After everyone drove 120km, one friend finished the y driving an extra 55km. That friend drove 175km in total. How far was the before the one friend drove the extra 55km?

Linear equation: x =

5) A bag of carrots was divided into 8 groups for 8 bunnies to eat. Each bunny got 6 carrots, however, one of the bunnies found a different bag of carrots and ate 15 extra carrots before being caught. That bunny was able to eat 21 carrots in total. How many carrots were in the original bag of carrots.

Linear equation: x =

Exit Cards

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

Name: ____________________

Represent the problems with linear equations (x/a + b = c) and solve for x.

A bag of candies was divided among 5 children equally. Each child received 10 candies. One child found another bag and ate an extra 5 candies. That child ate 15 candies in total. How many candies were in the original bag?

Name: ____________________

Represent the problems with linear equations (x/a + b = c) and solve for x.

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Name: _____ 154

Curriculum Connection
PE.3

Solving Linear Equations (x/a=b, x/a+b=c)

Instructions Solve the linear equations below by determining the value of x

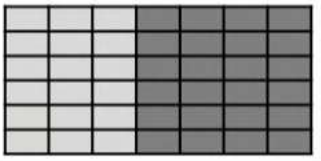
1) $\frac{x}{6} = 7$ $x =$	2) $\frac{x}{6} + 5 = 13$ $x =$	3) $\frac{x}{3} = 8$ $x =$
4) [illegible] $x =$	5) $\frac{x}{4} = 9$ $x =$	6) $\frac{x}{8} + 4 = 12$ $x =$
7) $\frac{x}{11} + 13 = 21$ $x =$	[illegible] $x =$	9) $\frac{x}{12} + 8 = 13$ $x =$
10) $\frac{x}{7} = 7$ $x =$	11) $\frac{x}{15} + 5 = 9$ $x =$	[illegible] = 7 $x =$
13) $\frac{x}{10} + 27 = 40$ $x =$	14) $\frac{x}{8} = 7$ $x =$	15) $\frac{x}{8} + 11 = 20$ $x =$
16) $\frac{x}{3} + 15 = 26$ $x =$	17) $\frac{x}{5} + 22 = 42$ $x =$	18) $\frac{x}{12} = 7$ $x =$

Name: _____ 155

Curriculum Connection
PE.3

Representing Linear Equations – a(x + b) = c

Instructions Write a pictorial representation of the linear equation provided

#	Linear Equation	Pictorial Representation	Verification
Ex)	6(x + 4) = 42 3	3 4 6  = 42	6(3 + 4) = 6 x 7 = 42 ✓
1)	x + 5)		
2)	4(x + 3) = 36 x =		
3)	2(x + 6) = 22 x =		
4)	7(x + 4) = 77 x =		
5)	8(x + 5) = 72 x =		
6)	6(x + 3) = 48 x =		

Name: _____ 156

Curriculum Connection
PE.3

Representing Linear Equations – a(x + b) = c

Instructions Represent the problems with linear equations a(x + b) = c and solve for x

1) 3 students were comparing what they had in their lunch today. All 3 students had the same number of pieces of fruit. They had 6 strawberries each and some raspberries as well. In total, the 3 students had 42 pieces of fruit. How many raspberries did each student have?

Li ation: x =

2) A uniform consist ey and The jersey costs $22. A team ordered 15 uniforms and paid a t 85 id each pair of shorts cost?

Linear equation: x =

3) Ralph ordered 7 slices of pizza and 7 drinks for him and his friends. The pizza slices were $4 each. Ralph paid $49 in total. How much did each drink cost?

Linear equation: x =

Name: _____ 160

Curriculum Connection
PE.3

Solving Linear Equations: a(x + b) = c

Instructions Solve the linear equations below by determining the value of x

1) $8(x + 4) = 56$ $x =$	2) $6(x + 7) = 66$ $x =$	3) $4(x + 5) = 32$ $x =$
4) $x =$	5) $11(x + 9) = 121$ $x =$	6) $12(x + 6) = 96$ $x =$
7) $6(x + 3) = 96$ $x =$	8) $5($ $x =$	9) $4(x + 6) = 52$ $x =$
10) $7(x + 11) = 105$ $x =$	11) $4(x + 12) = 8$ $x =$	12) 6 $) = 90$
13) $11(x + 7) = 110$ $x =$	14) $50(x + 5) = 450$ $x =$	15) $20(x + 4) = 220$ $x =$
16) $6(x + 6) = 150$ $x =$	17) $15(x + 11) = 225$ $x =$	18) $25(x + 3) = 375$ $x =$

Name: _____ 164

Curriculum Connection
PE.3

Representing Problems with Linear Equations

Instructions Represent the problems with linear equations

1) Jace performed 15 sets of pullups. At the end of the 15 sets, he had done 105 pullups. How many pullups did he do each set?

Linear equation: x =

2) An athlete earns m… dolla… …on. They signed a 1-time signing bonus of $500,000 and … 6 s… …al, they earned $18,500,000. How much do they earn per season?

Linear equation: x =

3) Diana practiced piano and violin during her summer break. For each day, she spent 2 hours practicing piano and 1 hour practicing violin. At the end of her break, she had spent 42 hours practicing her instruments in total. How many days did she practice?

Linear equation: x =

Name: _____ 165

Curriculum Connection
PE.3

Algebraic Bottle Flip Challenge

Objective

What are we learning about?

To practice and reinforce understanding of representing and solving linear equations through an engaging and physically active bottle flip game.

Materials

What you will need for the activity.

- pair/group) filled to
  with water (or use cups)
- Set of pro can b ented with linear equations.

Instructions

How you

1. Start with a short lesson on repres ting an ving equations.
2. Arrange the students into pairs or small and a bottle and a set of question cards to each.
3. Each pair or group receives an answer sheet to eir an
4. Explain the rules: One student draws a question ca ies ve t subtraction algebra problem.
5. Once they believe they have the correct answer, they write it answer sheet.
6. The student then gets to attempt a bottle flip. After answering eac estion, 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 linear equations and how this type of algebra is used in real-life situations.

Name: _____ 166

Curriculum Connection
PE.3

Directions	Cut out the questions below and use for the game

$5(x + 5) = 45$	Samantha bought 5 identical notebooks and a pen for $29. If each notebook costs $5, how much did the pen cost?
$+ 7 = 28$	A garden has a length of 65 metres and a width of x metres. The area of the garden is 520 square metres. Find the width.
$2x$ $= 5$	There are x apples equally divided among 3 baskets. Each basket has 8 apples. How many apples are there in total?
$9x - 11 = 16$	Thre s the number of candies s 4 ls 20. How many ca there?
$8x + 14 = 38$	A book cti us extra pages. The l n is 41. How many ch section hav
$7x - 5 = 30$	A large box contains 8 smaller boxes minus 12 items in total. If the large box has 36 items, how many items does each small box have?
$10x + 9 = 49$	A school bought 12 identical desks and a teacher's desk for $780. If each identical desk costs $60, how much did the teacher's desk cost?

Name: _____ 167

Curriculum Connection
PE.3

Directions Cut out the questions below and use for the game

$x/2 + 3 = 11$	The total weight of 10 identical boxes minus 6 kg is 44 kg. What is the weight of each box?
$\_ - 7 = 29$	Two times the number of students in a group divided by 5 equals 8. How many students are in the group?
$4x \_ 36$	Four times the age of a person minus 6 equals 30. How old is the person?
$11x - 8 = 36$	Five [illegible] number minus 8 equals [illegible]. W[illegible] the number?
$5x + 13 = 48$	Seven time[illegible] nu[illegible]dents plus 3 equals 52. H[illegible]nts are t[illegible]re?
$3x - 9 = 12$	Four times the length of a rope minus 7 cm equals 13 cm. What is the length of the rope?
$9x + 5 = 86$	Five times the age of a person minus 7 equals 38. How old is the person?

Name: _____ 168

Curriculum Connection
PE.3

Directions	Cut out the questions below and use for the game

7x - 14 = 28	A rectangle's length is 5 metres more than its width. If the perimeter of the rectangle is 30 metres, what is the width?
+ 8 = 26	Jane has 3 times as many apples as Tom. Together, they have 48 apples. How many apples does each person have?
8x 60	The number of boys in a class is 4 more than the number of girls. If there are 24 students in total, how many boys are there?
6x + 10 = 40	Thr es the number of chairs min eq 14. How many chairs re?
x/3 - 2 = 7	The total r er ided by 4 plus 3 equa y apples a th
4x + 5 = 21	Eight times the number of books plus 2 equals 50. How many books are there?
12x + 7 = 55	Nine times the height of a building minus 1 equals 80. What is the height of the building?

Name: _____ 169

Curriculum Connection
PE.3

Answers

Record your answers below

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42	

Tally

Record your makes and misses

Makes	Misses	Incorrect Answers	Final Score

Name: _____ 170

Unit Test – Variables and Equations

Part 1 Evaluate the following expression for x = 5 and p = -7

1) $(x) + (p) - 11$	2) $17 + x + (p)$	3) $(19 - x) - (p)$	4) $x + (26 + p)$
5) 54 ÷ (	6) $22 + 8x - (p + 5)$	7) $12 - \frac{7x}{p} + 5p$	8) $9x + (2p - x)$

Part 2 Put a slas[illegible] the [illegible]gn (≠) if it is not balanced

1) (-9) + 7 = 2	2) 1[illegible]18) =	3) (-21) + 13 = -8
4) $\frac{50}{10} = -10$	5) $\frac{36}{-9} = (-$	[illegible] $\frac{48}{}$ = 6

Part 3 Simplify the equations below. Make sure the va[illegible]ble

1) $x = 9 + 14 - 5$

2) $x = 24 \div 6$

3) $48 = x + 56$

4) $x + (3 \times 4) = 60 \div (-10)$

Part 4 Solve the linear equations below by determining the value of x

1) $6x = 84$ $x =$	2) $4x + 14 = 62$ $x =$	3) $11x + 24 = 79$ $x =$
4) [illegible] $x =$	5) $\frac{x}{6} = 12$ $x =$	6) $\frac{x}{6} + 7 = 18$ $x =$
7) $8(x + 5) = 96$ $x =$	8) [illegible] $x =$	9) $7(x + 12) = 140$ $x =$

Part 5 Represent the problems with linear equations

1)	A hot tub repair technician charges $125 for a service call plus an additional hourly rate. The technician just earned $245 for a 4-hour call. How much does the technician earn per hour? Linear equation: $x =$

2) Jordan has 5 children. He bought them all the same 2 Christmas presents. He bought them each a new hockey stick for $45. He also bought them each a new sweater. In total, Jordan spent $560 on the sweaters and hockey sticks. How much does each sweater cost?

Linear equation: $x =$

3) A [illegible] friends earned some money today selling lemonade. Leah took home $[illegible] already had $142, which means she now has $177. How much did the [illegible]?

Linear equ[illegible] $x =$

4) Ava has 4 bags of oranges, and [illegible] bag con[illegible]me number of oranges. She also has 7 more oranges that she picke[illegible]m he[illegible]rd tree. In total, Ava has 39 oranges. How many oranges are [illegible] bag?

Linear equation: $x =$

5) Samantha went to the gym for 4 days last week. She spent 20 minutes on the elliptical machine and lifted weights for the rest of her workout. In total, she spent 2 hours and 20 minutes at the gym last week. How many minutes did she spend lifting weights each day?

Linear equation: $x =$