Mathematician_____ Date_____

Integrated Math 1 POL Rubric					
	Grading Expectations				Grade
	4 Checks = 4	3 Checks = 3	2 Checks = 2	1 Check = 1	
Habit of Mind: Presentation Accountability	☐ Professional Dress ☐ Has Evidence of POL practice (Boolean Summary, Concept Map Targeted Practice, Model Cards) ☐ Presentation is at least 5 minutes in length ☐ Productive, punctual and respectful member of POL audience and panel				
Habit of Mind: Presentation Quality	☐ Speaks clearly, with accurate pronunciation and presentation volume. ☐ Makes eye contact and maintains a calm, present demeanor. ☐ Body language is confident and professional. ☐ Has a neatly organized, well-planned explanation that is easy to follow.				
MP1: Make sense of problems and persevere in solving them	☐ Identify givens, relationships, and objective of the problem. ☐ Students can plan a solution pathway rather than simply jumping into a solution attempt. ☐ Can explain correspondences between equations, verbal descriptions, tables, and graphs ☐ They make conjectures about the form and meaning of the solution and put solutions into appropriate context				
MP3: Construct viable arguments	☐ Understands and uses stated assumptions, definitions, and previously established results in constructing arguments. ☐ Builds a logical progression of statements to explore the truth of their conjectures. ☐ Justifies their conclusions by making plausible arguments that take into account the context from which the data arose. ☐ Uses academic language and definitions of concepts to aid in their justification				
	4	**3**	**2**	**1**	
Check One: ☐ ESK 1 ☐ ESK 2 ☐ ESK 3 ☐ ESK 4 ☐ ESK 5 **Check One:** ☐ Routine ☐ Non-Routine	• Presentation demonstrates a **full and complete understanding** of ESK using drawing, diagrams, and other representations • Presents **complete thought process** of evidence to explain understanding of ESK (Approach, plan, and execution). • Can **analyze mistakes** and corrections **on their own**	• Presentation demonstrates an **understanding** of ESK • Presents **most of thought process** of evidence to explain understanding of ESK. • Can **analyze mistakes** and make corrections **when prompted**	• Presentation demonstrates a **partial understanding** of ESK • Presents **some of the thought process** of evidence to explain ESK. • Can **analyze some mistakes** and make corrections **when prompted**	• Presentation demonstrates **an incomplete or no understanding** of ESK • Does **not show thought process** to explain ESK. • **Cannot analyze mistakes** and make corrections **when prompted**	**Pass** / **Fail**
Comments:					**Final Grade**

ESK 1: Data Analysis and Probability

Skills Quiz

Lesson	Status	Concepts I Am Working on
Lesson 1: Sampling and Bias	Pass / No Pass	☐ I can determine the who makes up a sample and the population ☐ I can determine sampling methods ☐ I can identify potential bias in sampling ☐ I can distinguish misleading data
Lesson 2: Data Analysis	Pass / No Pass	☐ I know how to find the mean of the data set. ☐ I know how to find the median of the data set. ☐ I know how to find the mode of the data set. ☐ I know how to find the range of the data set. ☐ I know how to find outliers of the data set.
Lesson 3: Box Plot	Pass / No Pass	☐ I know how to read a box plot. ☐ I know how to create a box plot. ☐ I know how to find the Interquartile Range.
Lesson 4: Histogram	Pass / No Pass	☐ I can read a histogram. ☐ I can determine intervals. ☐ I can calculate frequencies. ☐ I can scale my graph to create a Histogram.
Lesson 5: Scatter Plot	Pass / No Pass	☐ I can create a Scatter Plot ☐ I can determine Causation and/or Correlation based on a data set. ☐ I can create a line of best fit to predict data that is not presented ☐ I can create a line Plot. ☐ I can predict data that is not presented on a scatter plot.
Lesson 6: Probability	Pass / No Pass	☐ I can to identify the probability of a particular event happening.

Test Results

	Question 1 Sampling and Bias	**Question 2** Box Plot	**Question 3** Histogram	**Question 4** Scatter Plot	**Question 5** Probability
Test A					
Test B					
ESK 2					

ESK 2: System of Equations

Skills Quiz

Lesson	Status	Concepts I Am Working on
Lesson 1: **Solving Systems by Graphing (Slope Intercept Form)**	Pass / No Pass	☐ Write an equation(s) in slope intercept form a word problem ☐ Graph using the slope and y-intercept ☐ Identify and interpret the solution to a system ☐ Write an equation(s) in slope intercept form a graph
Lesson 2: **Solving Systems by Graphing (Standard Form)**	Pass / No Pass	☐ Write an equation(s) in Standard Form from a word problem ☐ Graph using x and y intercepts ☐ Change Standard form to Slope Intercept form if necessary

Test Results

	Question 1 **Solving Systems by Graphing (Slope Intercept Form)**	**Question 2** **Solving Systems by Graphing (Standard Form)**
Test A		
Test B		

Which ESK will you do for your POL? Explain your reasoning.

_____
_____
_____
_____
_____

Which ESK will you do for your choice final? Explain your reasoning.

_____
_____
_____
_____
_____

Data Analysis – Routine Problems

Lesson 1: Sampling and Bias

Determine the population, sample, sampling method and state whether the sample is biased or unbiased. Explain. You want to estimate the number of students in your grade who choose math as their favorite subject. You survey 10 of your close friends.	**Determine the population, sample, sampling method and state whether the sample is biased or unbiased. Explain.** You want to estimate the number of people in a town in favor of a proposed curfew law. You survey every fifth person who enters a post office.

Determine whether the conclusion is valid. Explain. You want to know how the residents of your town feel about a Laundromat going out of business. You survey 100 people who enter the Laundromat. Ninety are disappointed about the closing, and ten are not. So, you conclude that 90% of the residents of your town are disappointed about the Laundromat going out of business.	

Lesson 2: Data Analysis

Determine the mean, median, mode, and range of the data set: 3,5,1,5,1,1,2,3,15	Determine the mean, median, mode, and range of the data set 13,30,16,19,20,22,25,31
Determine the mean, median, mode, and range of the data set: 12,9,17,15,10	Determine the mean, median, mode, and range of the data set 14,15,3,15,14,14,18,15,8,16

Lesson 3: Box Plot

Make a box plot for the following data. Hours of Television watched: 0,3,4,5,2,4,6,5	Make a box plot for the following data. Cell phone prices: 124,95,105,110,95,124,300,190,114
Make a box plot for the following data. Cat length: 16,18,20,25,17,22,23,21	Make a box plot for the following data. Players points in a season: 14,16,20,5,22,30,16,28

Lesson 4: Histogram

Make a histogram for the following data set

Hours online	Frequency
0–3	5
4–7	7
8–11	12
12–15	14
16–19	26
20–23	45
24–27	33

Make a histogram for the following data set

ATM Withdrawals (dollars)		
120	100	70
60	40	80
150	80	50
120	60	175
30	50	50
60	200	30
100	150	110
70	40	100

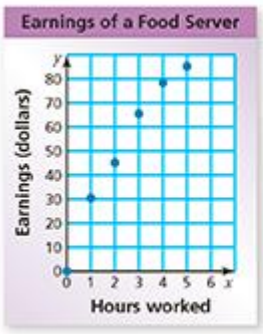
Make a histogram for the following data set

Email Attachments Sent				
74	105	98	68	64
85	75	60	48	51
65	55	58	45	38
64	52	65	30	70
72	5	45	77	83
42	25	95	16	120

Make a histogram for the following data set

Number of volunteer hours	1–2	3–4	5–6	7–8	9–10	11–12	13–14
Frequency	1	5	12	20	15	7	2

Lesson 5: Scatter plot (line of best fit)



5. **EARNINGS** The scatter plot shows the total earnings (wages and tips) of a food server during 1 day.
   a. About how many hours must the server work to earn $70?
   b. About how much did the server earn for 5 hours of work?
   c. Describe the relationship shown by the data.

SUVS The scatter plot shows the number of sport utility vehicles sold in a city from 2005 to 2010.

a. In what year were 1000 SUVs sold?

b. About how many SUVs were sold in 2009?

c. Describe the relationship shown by the data.

Lesson 6: Probability

Use the spinner to determine the theoretical probability of the event.

4. Spinning red

5. Spinning a 1

6. Spinning an odd number

7. Spinning a multiple of 2

8. Spinning a number less than 7

9. Spinning a 7

10. LETTERS Each letter of the alphabet is printed on an index card. What is the theoretical probability of randomly choosing any

Data Analysis – Non Routine Problems

Lesson 1: Sampling and Bias

INSTRUMENT You want to know the number of students in your school who play a musical instrument. You survey the first 15 students who arrive at a band class.

a. What is the population of your survey? the sample?

b. Is the sample reasonable? Explain.

Which sample is better for making a prediction? Explain.

12.

Predict the number of students in a school who like gym class.	
Sample A	A random sample of 8 students from the yearbook
Sample B	A random sample of 80 students from the yearbook

You want to estimate the number of students in a high school who ride the school bus. Which sample is best?

Ⓐ 4 students in the hallway

Ⓑ All students in the marching band

Ⓒ 50 seniors at random

Ⓓ 100 students at random during lunch

Lesson 2: Data Analysis

Find the value of x
2,8,9,7,6,x . The mean is 6

The following data set is in order from least to greatest, Find the value of x
9,10,12,x,20,25; The median is 14

Find the value of x
12.5,-10,-7.5,x. The mean is 11.5

The following data set is in order from least to greatest, Find the value of x
30,45,x,100; The median is 51

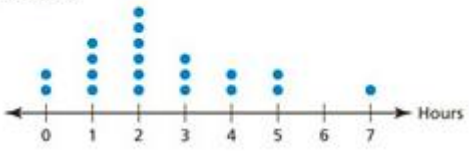
Lesson 3: Box Plot

ANALYZING DATA The stem-and-leaf plot represents the lengths (in inches) of the fish caught on a fishing trip. Make a box-and-whisker plot that represents the data.

Stem	Leaf
0	6 7 8 8 9
1	0 0 2 2 3 4 4 7
2	1 2

Key: 1|0 = 10 inches

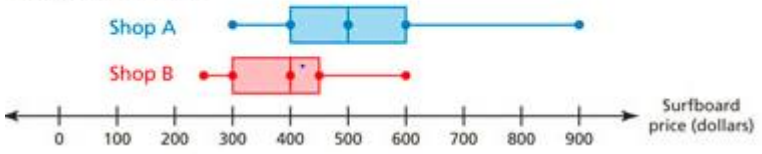
ANALYZING DATA The dot plot represents the numbers of hours students spent studying for an exam. Make a box-and-whisker plot that represents the data.



Make a box plot for the following data.

Evaluation of an airplane: -2,0,5,-4,1,-3,2,0,2,-3,6

The double box-and-whisker plot represents the surfboard prices at Shop A and Shop B. Identify the shape of each distribution. Which shop's prices are more spread out? Explain.



Lesson 4: Histogram

Make a histogram for the following data set

Stem	Leaf
1	1 1 3 4 8
2	2 3 4 7 8
3	1 2 4 9
4	0 3 2
5	7 9
6	6

Key: 3|1 = 31

Waiting Times (minutes)									
26	38	15	8	22	42	25	20	17	18
40	35	24	31	42	29	25	0	30	13

a. Display the data in a histogram using five intervals beginning with 0–9. Describe the shape of the distribution.

b. Display the data in a histogram using 10 intervals beginning with 0–4. What happens when the number of intervals is increased?

c. Which histogram best represents the data? Explain your reasoning.

Lesson 5: Scatter plot (line of best fit)

Year, x	0	1	2	3	4	5	6	7
Bats (thousands), y	327	306	299	270	254	232	215	197

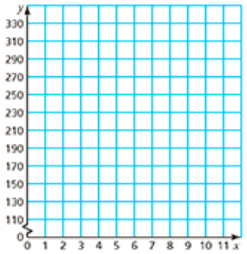
Use the following steps to predict the number of bats that will be living in the mine after 3 years.

a. Graph the data in the table.

b. Draw the straight line that you think best approximates the points.

c. Write an equation of the line you drew.

d. Use the equation to predict the number of bats in 3 years.



Month, x	0	1	2	3	4	5	6	7
Length (in.), y	22.0	22.5	23.5	25.0	26.0	27.5	28.5	29.5

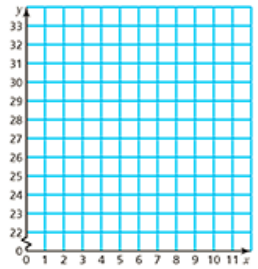
Use the following steps to predict the baby alligator's length next September.

a. Graph the data in the table.

b. Draw the straight line that you think best approximates the points.

c. Write an equation of the line you drew.

d. Use the equation to predict the baby alligator's length next September.



Lesson 6: Probability

WHICH ONE DOESN'T BELONG? Which spinner does *not* belong with the other three? Explain your reasoning.


Spinner 1


Spinner 2


Spinner 3


Spinner 4

A number cube is rolled. Determine if the game is fair. If it is *not* fair, who has the greater probability of winning?

12. You win if the number is odd. Your friend wins if the number is even.

13. You win if the number is less than 3. If it is not less than 3, your friend wins.

System of Equations- Routine Problems

Lesson 0: Slope

<table>
<tr>
<td>What is the slope for the line with points shown in the tables below?

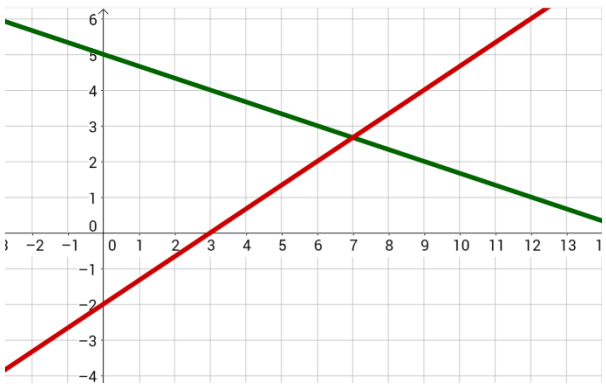
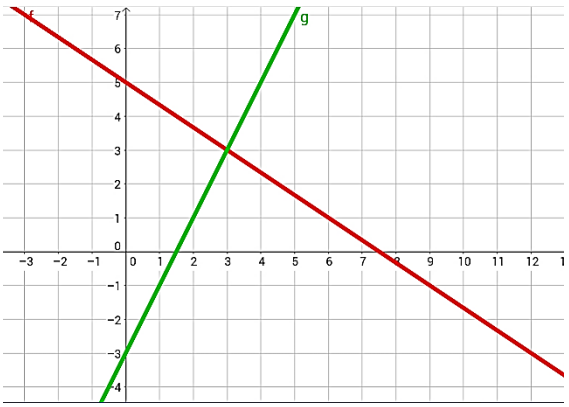
<table>
<tr><td>x</td><td>−2</td><td>−1</td><td>0</td><td>1</td><td>2</td></tr>
<tr><td>y</td><td>19</td><td>14</td><td>9</td><td>4</td><td>−1</td></tr>
</table>
</td>
<td>Calculate the slope of the line containing the points in the table below

<table>
<tr><td>input (x)</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td></tr>
<tr><td>output ($f(x)$)</td><td>4</td><td>10</td><td>16</td><td>22</td><td>28</td></tr>
</table>
</td>
</tr>
<tr>
<td>Calculate the slope of the line that goes through the points (−15, 70) and (5, 10)</td>
<td>Azizah got 1 for the slope of the line through points (1, 2) and (4, –1). Explain to her the mistake she made and how to calculate the slope correctly.</td>
</tr>
</table>

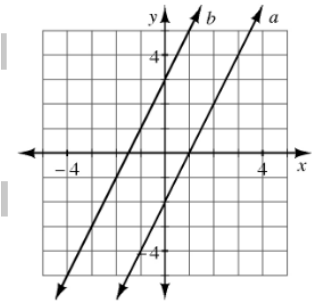
Lesson 1: Solving Systems by Graphing (Slope Intercept Form)

<table>
<tr>
<td>$y = -\frac{1}{2}x + 7$
$y = x - 8$</td>
<td>$y = -x + 8$
$y = x - 2$</td>
</tr>
<tr>
<td>$y = x$
$y = -3x + 8$</td>
<td>$y = -x - 1$
$y = 3x + 5$</td>
</tr>
<tr>
<td>$y = \frac{3}{4}x - 4$
$y = -\frac{1}{2}x + 11$</td>
<td>$y = -2x + 5$
$y = 4x - 1$</td>
</tr>
</table>

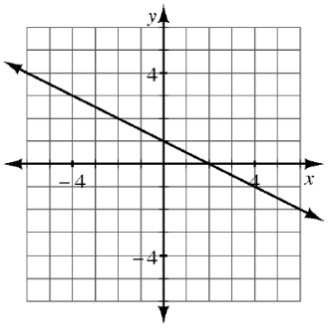
Write an equation to the following system. Be sure to explain the step you took in your process.

<table>
<tr>
<td>  </td>
<td> 
</td>
</tr>
</table>

When Yoshi graphed the lines $y = 2x + 3$ and $y = 2x - 2$, she got the graph shown at right.



One of the lines at right matches the equation $y = 2x + 3$, and the other matches $y = 2x - 2$. Which line matches which equation?



Write an equation to the following graph

Lesson 2: Solving Systems by Graphing (Standard Form)

Graph the following system. Determine if it has one solution, no solution, or infinite solutions. Write the process you took to graph the system. DO NOT CHANGE THE FORM OF THE EQUATION

$2x + 3y = 9$ $-3x + 3y = -6$	$3x + 4y = 12$ $2x + 4y = 12$
$2x - 4y = 16$ $4y - x = -8$	$x + 2y = 14$ $-x + 3y = 24$
$2x - y = -2$ $2x + 4y = 8$	$6y + 3x = 18$ $-x + 4y = 24$
$2y - x = 6$ $-3y + x = -9$	$x - 4y = -4$ $-3x - 4y = 12$

System of Equations - Non Routine Problems

Graph the following system. Determine if it has one solution, no solution, or infinite solutions. Write the process you took to graph the system.

$x = 8 - 2y$ $y - x = 4$	$y = \frac{1}{2}x + 4$ $2y - x = -4$
$4x - 2y = 6$ $y = 2x + 10$	$x = -2y - 3$ $4y - x = 9$
$x - 2y = 4$ $y = -\frac{1}{2}x + 4$	$2x - y = 10$ $y = -4x + 2$
$y = -2x + 5$ $2y + 4x = 10$	

Aimee thinks the solution to the system below is $(-4, -6)$. Eric thinks the solution is $(8, 2)$. Can they both be correct?

Demonstrate that you know who is correct by showing your work for both possible solutions

$2x - 3y = 10$
$6y = 4x - 20$

When Mei solved the system of equations below, she got the solution $x = 1, y = 6$.

Without solving the system yourself, can you tell her whether this solution is correct? How do you know?

$4x + 3y = 22$
$x - 2y = 0$

Intercepts and intersections are similar, but they are not exactly the same. How can you tell which one you are looking for? Read the situations below and decide if the graphical solution would best be represented as an intercept or an intersection. Be prepared to defend your decision. Note: You do not need to solve the problem!

a. A 5-gram candle on a birthday cake is lit. Two minutes after it is lit, the candle weighs 4.2 grams. How long will the candle burn?

b. A local bowling alley charges you $4 to rent shoes and $3.50 for each game you play. Another alley charges you $7 to rent shoes and $2 for each game you play. How many games would you need to play in order for both alleys to charge you the same amount?

c. Two months after Aliya's birthday, she had $450, while her sister Claudia had $630. Five months after her birthday, Aliya had $800, while Claudia had $920. How much did each person have on Aliya's birthday?

Ariel bought several bags of caramel candy and several bags of taffy. The number of bags of taffy was 5 more than the number of bags of caramels. Taffy bags weigh 8 ounces each, and caramel bags weigh 16 ounces each. The total weight of all the bags of candy was 400 ounces. How many bags of candy did she buy?	Pat was in a fishing competition at Lake Pisces. He caught some bass and some trout. Each bass weighed three pounds, and each trout weighed one pound. Pat caught a total of 30 pounds of fish. He got five points in the competition for each bass, but since trout are endangered in Lake Pisces, he lost one point for each trout. Pat scored a total of 45 points.
A roofing contractor buys 30 bundles of shingles and 4 rolls of roofing paper for $1040. In a second purchase (at the same prices), the contractor buys 8 bundles of shingles for $256. Find the price per bundle of shingles and the price per roll of roofing paper.	**MODELING WITH MATHEMATICS** You sell small and large candles at a craft fair. You collect $144 selling a total of 28 candles. How many of each type of candle did you sell? 
MODELING WITH MATHEMATICS You have 40 minutes to exercise at the gym, and you want to burn 300 calories total using both machines. How much time should you spend on each machine? *(See Example 3.)* **Elliptical Trainer**  8 calories per minute **Stationary Bike**  6 calories per minute	**MAKING AN ARGUMENT** You and a friend are going hiking but start at different locations. You start at the trailhead and walk 5 miles per hour. Your friend starts 3 miles from the trailhead and walks 3 miles per hour.  **a.** Write and graph a system of linear equations that represents this situation. **b.** Your friend says that after an hour of hiking you will both be at the same location on the trail. Is your friend correct? Use the graph from part (a) to explain your answer.