

COMMON FORMATIVE ASSESSMENT PLANNING TEMPLATE

--FIRST DRAFT--

Grade Level or Course: 7th & 8th grade Advanced Prealgebra

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Assessment Topic: Linear Equations

Selected Power Standards: List standards by number and include the full text here. Then “unwrap” to identify what students need to know and be able to do. Underline the concepts (important nouns or noun phrases) and circle the skills (verbs).

Power Standard (What Students will do)

Algebraic Relationships Grade 7 & 8

7th - Graph linear equations on a coordinate grid by making a table using whole number coordinates.

8th - Translate between and interpret linear relationships represented by words (rate of change and y-intercept), symbols (equations of the slope-intercept form $y = mx + b$), tables and graphs.

Use Compare and Contrast and writing strategies to help students develop a meaningful understanding of these Standards.

Graphic Organizer of “Unwrapped” Concepts and Skills

Concepts to Teach (9 Lessons)

- Linear relationships in graphs, equations and tables
- Ordered pair solutions on the coordinate plane
- Patterns for x and y values in tables (slope as change in y over change in x)
- Patterns for x and y values in graphs (slope as rise over run)
- Patterns in equations (slope as the coefficient of x)
- Y-intercept in graphs (the point where the line crosses the y-axis)
- Y-intercept in tables (the value of y when x is zero)
- Y-intercept in equations of the form $y = mx + b$ (the constant term)
- Function notation

Skills: Be able to Do

(Next to each skill, write number in parentheses indicating approximate level of Bloom's Taxonomy of thinking skills. Refer to Bloom's Taxonomy resource in supporting documents.)

- (3) Solve (for given x values in linear/nonlinear equations)**
- (3) Organize (ordered pair solutions in a table)**
- (2) Graph (ordered pair solutions on a coordinate grid)**
- (4) Compare (tables of ordered pair solutions)**
- (4) Describe and Analyze (patterns for x and y values)**
- (6) Draw Conclusions (about graphs of different tables.)**
- (5) Generalize Conclusions (to other tables and graphs to define linear relationships.)**
- (3) Compare (equations with their graphs and tables to note patterns in slopes and y-intercepts)**
- (5) Describe (in words how to translate between all 3 representations of linear relationships; graphs, tables, equations)**
- (2) Understand (function notation) and**
- (3) Evaluate (functions)**

Big Ideas from “Unwrapped” Power Standards

Linear relationships occur in real life and can be represented by equations, graphs, and tables.

Essential Questions Matched to Big Ideas

- 1. What kind of equations, graphs and tables represent linear relationships?**
- 2. How are slope and y-intercept used in graphs, tables and equations?**
- 3. What does function notation look like and how do we evaluate functions?**

SECTION 1: Selected-Response Items—Design multiple choice, matching, true-false, and/or fill-in items to assess student understanding of the following “unwrapped” concepts and skills represented on your graphic organizer. Indicate level of thinking skill in parentheses. *Match assessment items to rigor of skill level.* (Use additional space as needed.)

Warning: Lines on graphs must be drawn by hand.

Name _____

APA Chapters 11 & 12 Test

Recognize, Represent, Interpret and translate between Linear Relationships Using Graphs, Tables and Equations

_____ 1. Given the linear equation $y = 2x + 3$, what is the slope of the line?

- a. $m = 3$
- b. $m = 5$
- c. $m = 2$
- d. $m = 1$

_____ 2. Given the linear equation $y = 2x + 3$, what is the y-intercept of the line?

- a. $m = 3$
- b. $m = 5$
- c. $m = 2$
- d. $m = 1$

_____ 3. Which table represents solutions to the equation $y = 2x + 3$?

- a.

x	y
0	0
1	2
2	4
- b.

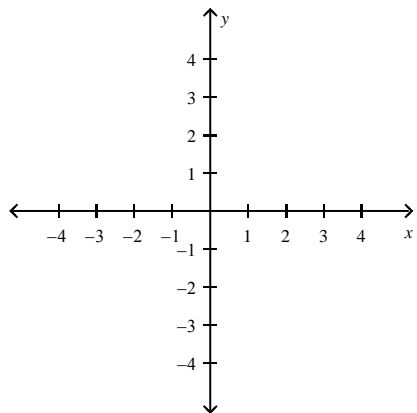
x	y
0	3
1	5
2	7
- c.

x	y
0	3
1	4
2	5
- d.

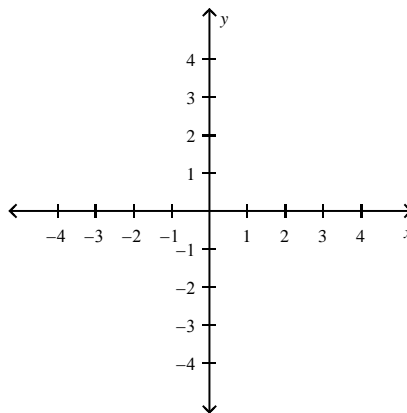
x	y
0	3
1	6
2	7

_____ 4. Which graph represents solutions to the equation $y = 2x + 3$?

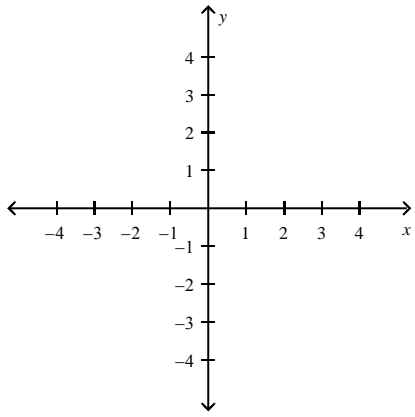
a.



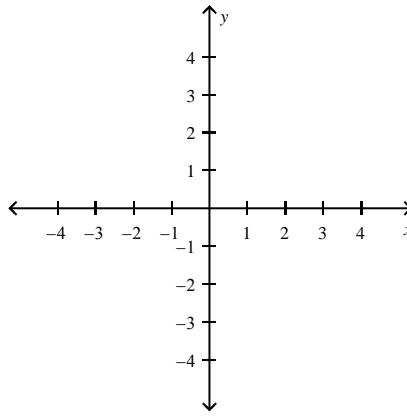
c.



b.



d.



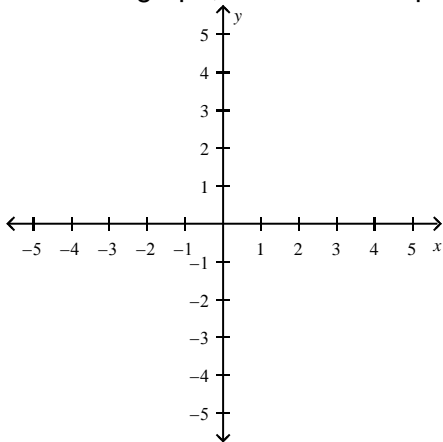
5. Given the table $\begin{array}{c|c} x & y \\ \hline 0 & -3 \\ 1 & -1 \\ 2 & 1 \end{array}$, which is the equation in slope-intercept form for the relationship?

$$\begin{array}{c|c} x & y \\ \hline 0 & -3 \\ 1 & -1 \\ 2 & 1 \end{array}$$

- a. $y = 2x + 3$
- b. $y = -3x + 2$

- c. $y = 3x + 2$
- d. $y = 2x - 3$

6. Given the graph, which is the equation for the relationship in slope-intercept form?



- a. $y = 2x + 3$
- b. $y = -3x + 2$

- c. $y = 3x + 2$
- d. $y = 2x - 3$

7. Compare the two equations $y = 2x - 1$ and $y = 2x + 3$, how are they alike and different?

- a. same slopes and y-intercepts
- b. different slopes and y-intercepts
- c. same slope and different y-intercept
- d. different slope and same y-intercept

8. For the function $f(x) = 5x - 3$, find $f(2)$.

- a. $f(2) = 2$
- b. $f(2) = 7$
- c. $f(2) = 8$
- d. $f(2) = 13$

Matching Choose the best answer.

- a. rise over run
- b. the coefficient of x
- c. change in y over change in x
- d. ski down the slope

SECTION 2: Extended Constructed-Response—Design an extended-response item to evaluate student understanding of the following “unwrapped” concepts and skills represented on your graphic organizer. Include level of thinking skill in parentheses. *Match item to rigor of skill level.* Evaluate student work using the Task-Specific Scoring Guide below (to be completed).

Amy buys a 6 inch plant for her window garden. The plant grows $1\frac{1}{2}$ inches per week. In how many weeks will Amy’s plant be double its original height?

Support your answer with a table, graph or equation in slope-intercept form.

Task-Specific Scoring Guide:

Exemplary

- All “Proficient” criteria *plus*:
- Answer is defended or verified using correct table, graph AND equation!

Proficient

- Correct answer is supported by
- correct table,
- graph or
- equation.

Progressing

- Meets 3-4 of the “Proficient” criteria

Beginning

- Meets fewer than 3 of the “Proficient” criteria
- Task to be repeated after remediation

Teacher’s Evaluation _____

Comments regarding student’s performance:

SECTION 3: Short Constructed-Response

Note to Teachers: This portion of the common formative assessment requires students to demonstrate their *integrated* understanding of all the “unwrapped” concepts and skills from the targeted Power Standards by expressing their understanding of the Big Ideas in their own words. Copy your planned Essential Questions (and corresponding Big Idea responses) for your own reference in the space provided.

Warning: Coordinate grids for problems 1,2,3 &7 must be added with Line drawn for #7. Also, “T” tables must be drawn for 1,2,3 & 6.

Name _____

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Essential Question #1

What kinds of equations, tables and graphs represent linear equations?

Directions: For equations 1 - 3, do three things:

1. Make a table of solution values using $x = 0, 1, 2$
2. Graph
3. Write the slope “ $m = \underline{\quad}$ ” and the y-intercept “ $b = \underline{\quad}$ ”

Equation	Table	Graph
1. $y = 2x + 3$ $m = \underline{\quad}$ $b = \underline{\quad}$	x $y = 2x + 3$ 0 1 2	
2. $y = 2x - 1$ $m = \underline{\quad}$ $b = \underline{\quad}$	x $y = 2x - 1$ 0 1 2	
3. $y = x + 3$ $m = \underline{\quad}$ $b = \underline{\quad}$	x $y = x + 3$ 0 1 2	

4. Compare equations 1 & 2, describe how they are alike and how they differ.

alike _____

different _____

5. Compare equations 1 & 3, describe how they are alike and how they differ.

alike _____

different _____

PAGE 2

Essential Question #2

How are slope and y-intercept used in graphs, tables and equations?

Slope-Intercept Form

$$y = mx + b$$

6. Given the table: x y Write an equation of the form $y = mx + b$?

0 -3

1 -1

2 1

7. Given the graph: Write an equation of the form $y = mx + b$?

8. Describe how you find slope by looking at:

a. an Equation _____

b. a Table _____

c. a graph _____

9. Describe how you find the y-intercept by looking at:

a. an Equation _____

b. a Table _____

c. a graph _____

Essential Question #3

What does function notation look like and how do we evaluate functions?

10. Find $f(-1)$, $f(0)$, $f(2)$ for the function below. Circle your answer.

Function	$f(-1)$	$f(0)$	$f(2)$
$f(x) = 5x - 3$			

Student Directions: Write a Big Idea response for each of the **preceding** Essential Questions. Include supporting details and any vocabulary terms from the “unwrapped” concepts you have been learning for each response. Your responses will be evaluated using the Generic Scoring Guide below.

Generic Scoring Guide:

Exemplary

- All “Proficient” criteria *plus*:
- Makes connections to other areas of school or life
- Provides example(s) as part of explanation

Proficient

- Answers are correct and use concept vocabulary correctly.
- Lines are drawn through correctly graphed points with arrows at each end.
- Work is shown and supports correct answer.

Progressing

- Meets 2 of the “Proficient” criteria

Beginning

- Meets fewer than 2 of the “Proficient” criteria
- Task to be repeated after remediation

Teacher’s Evaluation _____

Comments regarding student’s performance:

Design Team Reflections after Administration of Assessment to Students

1. Which assessment items produced the results we intended?
2. Which items do we need to revise?
3. Regarding the design, administration, scoring, and analysis of the assessment, what worked? What didn't?
4. What do we need to do differently next time?
5. What should we again do the same?