A. Lesson Context

BIG PICTURE of this UNIT:	• What is meant by the term FUNCTIONS and how do we work with them? • mastery with working with basics & applications of linear functions • mastery with working with basics & applications of linear systems • understanding basics of function concepts and apply them to lines & linear systems		
CONTEXT of this LESSON:	Where we've been In Lessons 1-4, you practiced with basic concepts related to functions	Where we are Connecting to Linear Relations, we now look at different forms of equations that describe linear functions.	Where we are heading How do we apply the concept of "functions" to linear & exponential relations.

B. Lesson Objectives

a. Use an algebraic & graphic perspective to review fundamental skills (slope, intercepts, convert, evaluate & solve) related to slope-intercept & point-slope forms of linear equations
b. Introduce standard form & intercept form of linear equations & relate back foundational skills
c. Generate the graphs of these linear functions on technology (TI-84 & DESMOS)

C. Fast Five (Skills Review Focus)

1. Write the equation of a line that passes through (-1,4) and has a slope of ½.

2. Write the equation of a line that is parallel to the line $y = 2x - 1$ and passes through the point (8,-3)

3. Sketch the function defined by the equation $-2x + 5y = 20$

4. The points (1,1) and (3,9) are points on the parent function $y = x^2$. Determine the equation of the secant line through these two points. Illustrate with a diagram.

D. Observation Table for Exploration on Forms of Linear Equations

In this investigation, you will work with 4 different forms of equations for Linear functions as you learn how to analyze the linear function from its equation only (ultimately not using graphs)

Form of the Equation	Analysis of Key Features	
	Working with the equation f(x) = 2x – 3:	**Working with the equation f(x) = 2x – 3:**
(A) slope-intercept form or **Function Form** or **General Form** y = mx + b f(x) = mx + b EXAMPLE y = 2x - 3	(a) determine the slope of the line (b) determine the y-intercept of the line (c) determine the x-intercept of the line	(d) evaluate f(2) (e) solve f(x) = 3 (f) rewrite equation in slope-point form
Sketch: Include key points & labels & window settings		

E. Observation Table for Exploration on Forms of Linear Equations

In this investigation, you will work with 4 different forms of equations for Linear functions as you learn how to analyze the linear function from its equation only (ultimately not using graphs)

Form of the Equation	Analysis of Key Features	
(B) point-slope form $y - y_1 = m(x - x_1)$ also known as **transformational form** $f(x) - y_1 = m(x - x_1)$ $f(x) = m(x - x_1) + y_1$ EXAMPLE: $y - 3 = -\frac{1}{2}(x + 2)$	Working with equation $y - 3 = -\frac{1}{2}(x + 2)$: (a) determine the slope of the line (b) determine the y-intercept of the line (c) determine the x-intercept of the line	Working with equation $y - 3 = -\frac{1}{2}(x + 2)$ (d) evaluate f(2) (e) solve f(x) = 6 (f) convert to function form
Sketch: Include key points & labels & window settings		

F. Observation Table for Exploration on Forms of Linear Equations

In this investigation, you will work with 4 different forms of equations for Linear functions as you learn how to analyze the linear function from its equation only (ultimately not using graphs)

Form of the Equation	Analysis of Key Features	
(C) standard form Ax + By = C Or Ax + By + C = 0 also known as **implicit form** EXAMPLE: $5x-4y=60$	**Working with equation** $5x-4y=60$**:** (a) determine the slope of the line (b) determine the y-intercept of the line (c) determine the x-intercept of the line	Working with the equation $5x-4y=60$: (d) evaluate f(2) (e) solve f(x) = 6 (f) convert to function form (g) convert to point-slope form
Sketch: Include key points & labels & window settings		

G. Observation Table for Exploration on Forms of Linear Equations

In this investigation, you will work with 4 different forms of equations for Linear functions as you learn how to analyze the linear function from its equation only (ultimately not using graphs)

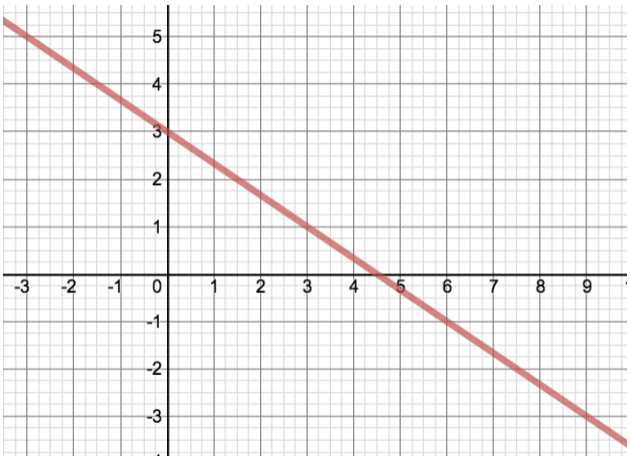
Form of the Equation	Analysis of Key Features	
(D) intercept form $\frac{x}{a}+\frac{y}{b}=1$ EXAMPLE: $\frac{x}{3}+\frac{y}{4}=1$	Working with equation $\frac{x}{3}+\frac{y}{4}=1$ (a) determine the slope of the line (b) determine the y-intercept of the line (c) determine the x-intercept of the line (d) convert to function form	Working with the equation $\frac{x}{3}+\frac{y}{4}=1$ (e) evaluate f(2) (f) solve f(x) = 6 (g) convert to point-slope form (h) convert to standard form
Sketch: Include key points & labels & window settings		

H. CONSOLIDATION on Forms of Linear Equations

(a) Rewrite the linear equation $4x - 2y - 12 = 0$ in slope-intercept, slope-point & intercept forms

(b) A line has a slope of $-\frac{3}{2}$ and has an x-intercept at -5. Write the equation in all four forms.

(c) Given the graph of the following line, write the equation in all four forms.



(d) A line passes through the points A(-2,5) and B(5,-1). Write the equation in all four forms.

(e) Write the equation of the perpendicular bisector of the line segment connecting A(-1,3) and B(3,9). Write the equation in all four forms.