(A) **Lesson Context**

BIG PICTURE of this UNIT:	• What is a Polynomial and how do they look? • What are the attributes of a Polynomial? • How do I work with Polynomials?		
CONTEXT of this LESSON:	Where we've been We have discussed the basics: degree, type, and operations (+, −, x)	Where we are What are the key attributes of a polynomial and how do these affect the shape?	Where we are heading What are the key attributes of a polynomial and how do these affect the shape?

(B) **Lesson Objectives:**

    a.   Work on and attempt to develp an understanding of KEY Vocabulary.
    b.   Begin to analyze the the attributes of a polynomial function and it's effect on the graph.
    c.   Observations and patterns in the graphs of polynomials.
    d.   Solidify our perdictions of how polynomials behave.

(C) **Some Context**

Lets try and get a grasp on what a Polynomail is, and then we have begun to develop some key vocabulary… now we will apply our knowledge without the use of technology and see if we can make connections between the two forms of a polynomial and their graphs.

Part 2: Graph Exploration: In this Exploration, you will be creating a poster that will highlight the ideas from the last couple of classes. Attached to this document is a list of

- 12 Factored Form Equations
- 12 Standard Form Equations
- 12 Graphs
  Your job is to cut them all out and organize them so that they match. You need to use color markers or highlighters to highlight the defining features of the graphs and the equations, showing with color coordination how you made your decisions.

At the end of each of the groupings you will describe how you made your choice in a small sentence. An example is below to show you what I mean…

Poster Example… Yours will obviously be much bigger. However you will need to try and fit all of them on there with a little bit of reasoning at the bottom… somewhere:

Factored Form	$Y = -x^2 - 3x$
Standard Form	$Y = (x + 4.5)(x + 1.5)(x - 3.5)(x - 1)$

Graph	Family Name: Linear???
	Reasoning for choices. Please point to, highlight. Etc. You need to do on of these for each of the graphs and make a cohesive poster will all the information on it. Reasoning… Reasoning… Reasoning… I chose these because the graph had a positive slope and the equation did as well. Also, I noticed that the constant term was 5… also I see that…

And Repeat like 11 more times ☺

Use color… draw arrows… write sentences… but make connections and justify your reasoning behind your choices. By the end this should look very colorful and have a lot of information on it.

An example of a finished poster…

Polynomials in Factored Form

$Y = -x(x + 3)$

$Y = x(x + 3)(x - 3)(x + 4)$

$Y = (x + 5)(x + 2)(x - 1)$

$Y = (x + 4)(x - 5)$

$Y = -(x + 3)(x - 3)(x + 2)(x + 5)(x - 1)$

$Y = x(x + 4)(x - 3)$

$Y = (x + 2)(x - 2)$

$Y = (x + 4.5)(x + 1.5)(x - 3.5)(x - 1)$

$Y = -x(x + 1)(x - 6)(x + 3)(x - 4)$

$Y = (3 - x)(x + 4)(x + 2)$

$Y = (x - 0.5)(x - 3)(1.5 - x)(x + 3)(x + 4)$

$Y = x(4 - x)(x + 6)(x + 1)$

Polynomials in Standard Form

$Y = x^4 + 1.5x^3 - 16.75x^2 - 9.375x + 23.625$

$Y = -x^2 - 3x$

$Y = x^4 + 4x^3 - 9x^2 - 36x$

$Y = -x^3 - 3x^2 + 10x + 24$

$Y = -x^5 - 6x^4 + 6x^3 + 64x^2 - 27x - 90$

$Y = x^3 + x^2 - 12x$

$Y = x^2 - 4$

$Y = -x^4 - 3x^3 + 22x^2 + 24x$

$Y = x^2 - x - 20$

$Y = -x^5 - 2.4x^4 + 16.25x^3 + 15x^2 - 65.25x + 27$

$Y = -x^5 + 6x^4 + 13x^3 - 66x^2 - 72x$

$Y = x^3 + 6x^2 + 3x - 10$

Polynomials Graphs