BINOMIAL EXPANSION EXPLORATION

Name: _____

Part 1

In the first part of the exploration, your goal is to use what you know about expanding binomials to expand each binomial below. Do your best to write your answer in standard form (there's a reason why that we'll look at later!)

A. $(a+b)^2$

B. $(a+b)^3$

C. $(a+b)^4$

Part 2

In this portion of the exploration, we're going to look at patterns we see in the binomial expansion and Pascal's Triangle. In groups of four, discuss the following questions. Take turns giving each person an opportunity to share their thoughts. After everyone has shared, come to a consensus (a collective agreement) and jot it down!

A. Assuming your expanded binomials are in standard form, what connections do you see in your answers and the rows of Pascal's Triangle?

B. Do you specifically see any patterns between the coefficients of your expanded binomials and the rows of pascals triangle?

C. Do you notice any patterns in the exponents associated with your terms in your expanded binomials?

D. Can you write $(a+b)^5$ and $(a+b)^{10}$ as a polynomial in standard form without multiplying? Try it!

Part 3

Compare your answers with another group. To do this, each person in group 1 can find a partner in group 2. Each pair needs to compare and contrast answers to parts 1 and 2 above. Once your check your work, return to your original group!

Part 4

So, expanding things like $(a+b)^3$ is probably proving to be pretty easy using Pascal's Triangle, but what happens if we incorporate numbers into our binomials. Your teacher has an additional handout called *Window Notes for Math* to help you organize your thoughts as you work through the problems below with a partner.

A. Expand $(x+y)^2$. Are there any differences between this and $(a+b)^2$? What did you substitute for *a?* What did you sub for b***?***

B. Expand $(2x+y)^2$ using Pascal's Triangle. *Hint: try subbing 2x for a and y for b?*

C. Expand $(3x+4y)^3$

D. Expand $(x-3)^5$