Graphing Translations Activity

Your last activity had you graphing four different translations of a parent function. A **<u>parent function</u>** is a basic function that no horizontal or vertical movement nor has it been stretched vertically or reflected over the x-axis or the y-axis. We will be focusing on two parent functions today: $f(x) = x^2$ and $g(x) = |x|$.

Objective: Today's objective is to use the Graph Translation Theorem and two dice to create translations of the parent functions.

> ***Graph Translation Theorem:*** *Given a parent function $f(x) = y$ with a horizontal shift of "h" units, a vertical shift of "k" units, and a vertical stretch of "a" units, the offspring function can be written as*

$$h(x) = a\big(f(x - h)\big) + k$$

> *Should "a" be negative, the offspring function will be reflected over the x-axis.*

Choose one die to represent the value for *"a", "h", and "k"*.   Roll the dice. Write the values face up in the table for question #1. Write the equation for the offspring function. Then, using your graphing calculator, plot the ***parent function*** and the ***offspring function*** on the coordinate grid (you will have to make up your own axes where it makes sense). You must also describe how the offspring is translated from the parent function (using good directions: left, up, down, right, reflected over the x-axis, vertically stretched…)

Instructions: You will complete this activity six times – three using $f(x) = x^2$ and three using $g(x) = |x|$. Please watch for the values of *"a", "h", and "k"* being either negative or fractional. In the case of fractional values, the denominator will represent the face up number of the die.