

ALGEBRA 1: QUADRATICS & CATAPULTS SUMMATIVE PERFORMANCE TASK

CATAPULT FUNCTION: Height vs. Distance

Standard Form/Factored Form/Vertex Form:

Define variables and explain each part of your function **mathematically** and in the **context of the problem**

Standard form: $h(d) = -0.394d^2 + 1.21d + 0.19$ $\{0 \leq d \leq 3.23\}$

Factored form: $h(d) = -0.394(d + 0.15)(d - 3.23)$ $\{0 \leq d \leq 3.23\}$

Vertex form: $h(d) = -0.394(d - 1.54)^2 + 1.125$ $\{0 \leq d \leq 3.23\}$

Standard form:

-mathematically, a determines the concavity and the direction of the parabola. In this context, it determines the flight path of the ball

-mathematically, b influences the location of the vertex

-mathematically, c is the y -intercept. In this context, it means the height of the ball when the ball was fired

Factored form:

-mathematically, m is one of the x -intercepts. In this context, it happens before the catapult is fired

-mathematically, n is also one of the x -intercepts. In this context, it's the distance the ball travels

-this function is best for determining both of the x -intercepts

Vertex form

-mathematically, h is the horizontal shift of the parabola/line of symmetry. In this context, it's the distance when the ball reaches the maximum height

-mathematically, k is the vertical shift of the parabola. In this context, it's the maximum height of the ball

-this function is best for determining the vertex of the parabola

GRAPH: Height vs. Distance

Show all key features on your graph of your Skittles flight as a Height vs. Distance.

