

## Angry Birds &amp; Quadratic Equations

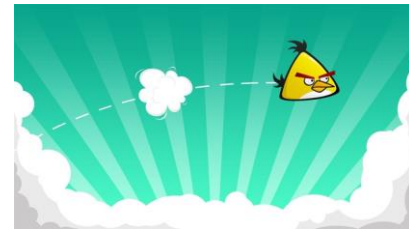
Objective: Students will utilize characteristics of parabolas discussed in the quadratic equation lessons to find the paths of projectile motions and use components of parabolas to come up with application problems.

Assume the followings:

- The blue bird, once tapped, would travel for a while then, split off and create two more birds with three flight paths.



- The red bird or yellow bird once tapped, it makes a parabolic motion.

Requirements:

Your assignment must include

- **Graphs:** (3 blue birds and 1 red or yellow bird)
  - Clear labeling of the 4 flight paths (path #, different colors, equation, & vertex)
  - Colorful layout that clearly shows structure, single shot, birds, pigs, etc.
- **Word Problems**
  - Equations - vertex form  $\{y=a(x-h)^2+k\}$  and standard form  $\{y=ax^2+bx+c\}$
  - 4 different types of questions (e.g. zeros, axis of symmetry, vertex, height at a certain distance of  $x$ , distance of  $x$  at a certain height, etc)
  - 4 different methods/means to solve the word problems (e.g. factoring, completion of square, quadratic equation formula, axis of symmetry, etc)

**Due Date:** \_\_\_\_\_

Late projects will receive 10% deduction if turned in w/in 1 week late & 20% thereafter.


## Grade 9 Math Semester 1 Project Quadratic Equations



Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

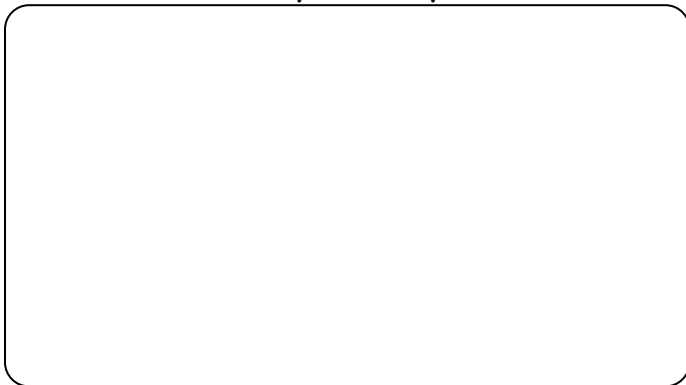
Criteria	Points Possible	Path #1	Path #2	Path #3	Path #4
1. Clear Path Drawn (different colors) and labeling (equation, vertex) on the Graph	3				
2. Equation in Vertex Form	2				
3. Equation in Standard Form	2				
4. Word Problem	4				
5. Method Used	2				
6. Correct Work	4				
7. Answers in Words	3				
Sub Total					
8. Creativity, Effort	5				
9. Neatness	5				
10. Name and Student ID on the Rubric	5				
11. Rubric Turned in with the Project	5				
<b><i>Final Grade</i></b>	<b>100</b>				

## I. Sketch

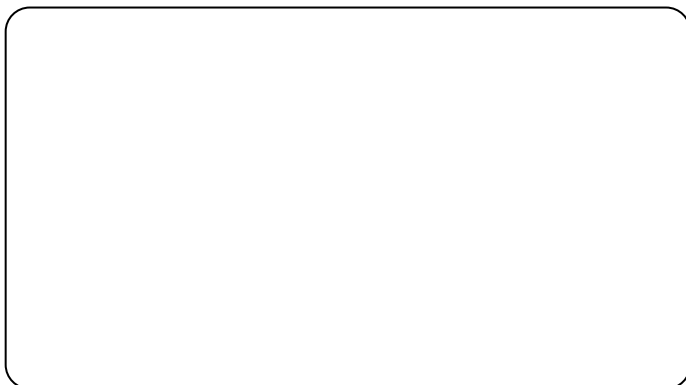


## II. What word problem questions can you ask for the followings?

a. axis of symmetry



c. y-value



b. vertex (x and/or y value)



d. zero



## Bird 1, Color ( \_\_\_\_\_ )

2. Vertex Form: \_\_\_\_\_

3. Standard Form: \_\_\_\_\_

4. **Word Problem.** Circle the Type (1.a.o.s., 2.vertex, 3.y-value, 4.zero, 5. other)

5 & 6. **Work.** Circle the Method (1.factoring, 2.completing the square, 3.quadratic equation formula, 4.axis of symmetry, 5.vertex, 6.other)

7. **Answer in Words**

## Bird 2, Color ( \_\_\_\_\_ )

2. Vertex Form: \_\_\_\_\_

3. Standard Form: \_\_\_\_\_

4. **Word Problem.** Circle the Type (1.a.o.s., 2.vertex, 3.y-value, 4.zero, 5. other)

5 & 6. **Work.** Circle the Method (1.factoring, 2.completing the square, 3.quadratic equation formula, 4.axis of symmetry, 5.vertex, 6.other)

7. **Answer in Words**

## Bird 3, Color (       )

2. Vertex Form: \_\_\_\_\_

3. Standard Form: \_\_\_\_\_

4. **Word Problem.** Circle the Type (1.a.o.s., 2.vertex, 3.y-value, 4.zero, 5. other)

5 & 6. **Work.** Circle the Method (1.factoring, 2.completing the square, 3.quadratic equation formula, 4.axis of symmetry, 5.vertex, 6.other)

7. **Answer in Words**

## Bird 4, Color ( \_\_\_\_\_ )

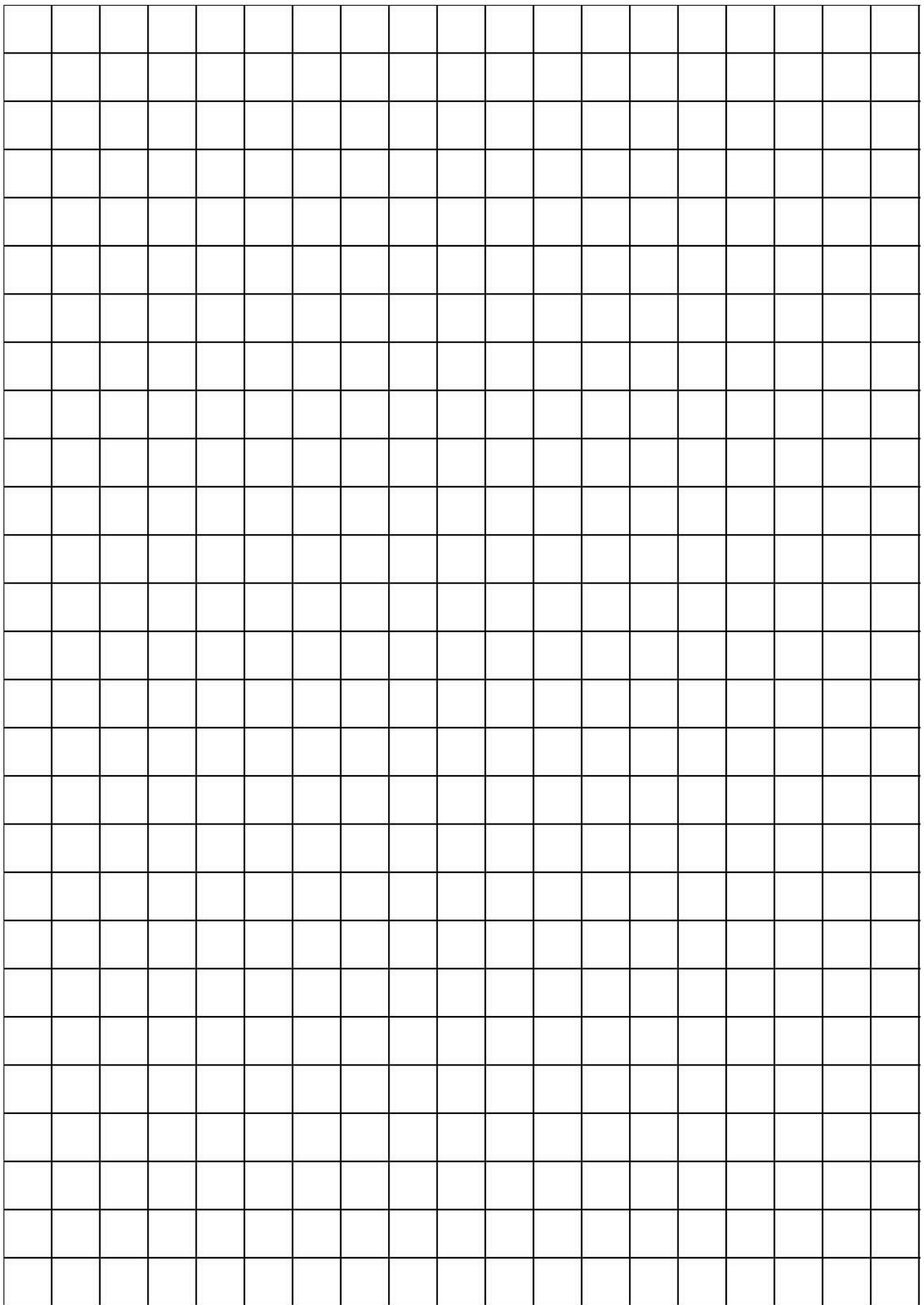
2. Vertex Form: \_\_\_\_\_

3. Standard Form: \_\_\_\_\_

4. **Word Problem.** Circle the Type (1.a.o.s., 2.vertex, 3.y-value, 4.zero, 5. other)

5 & 6. **Work.** Circle the Method (1.factoring, 2.completing the square, 3.quadratic equation formula, 4.axis of symmetry, 5.vertex, 6.other)

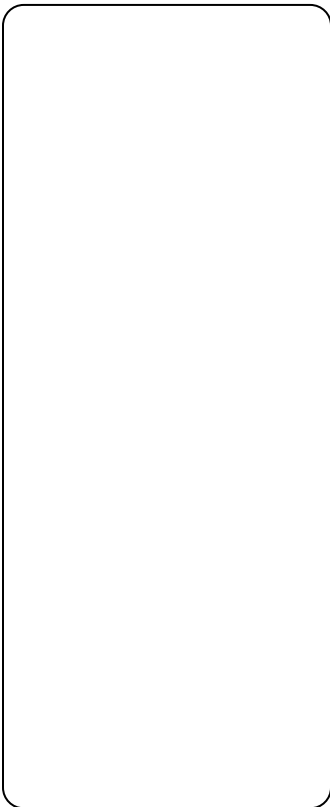
7. **Answer in Words**



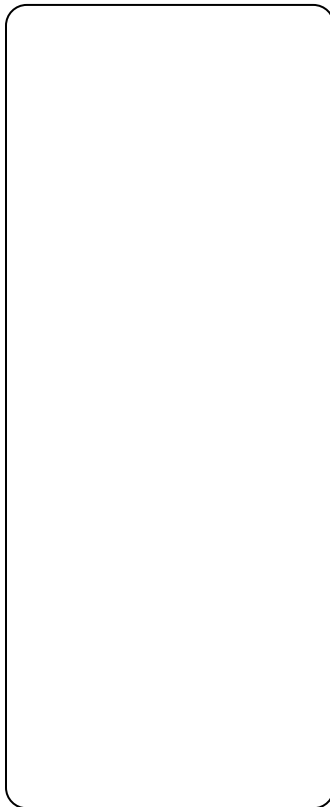


III. What type of questions can you ask for the followings?

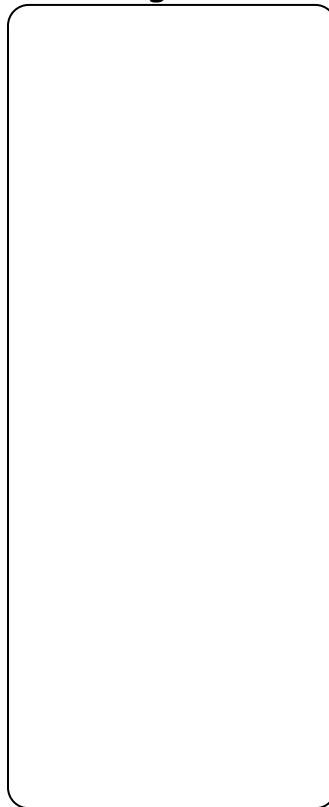
b. Vertex



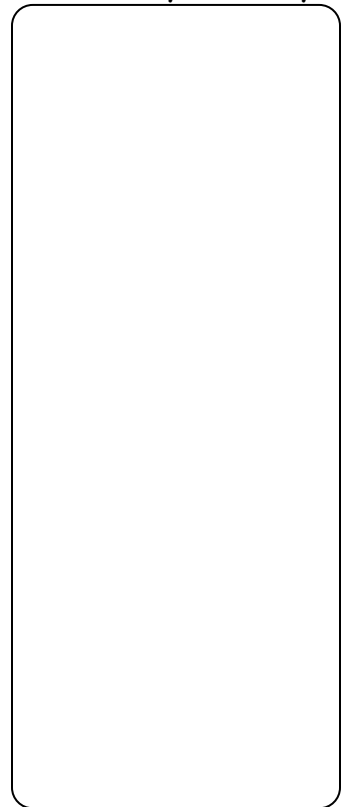
b. zero



c. height

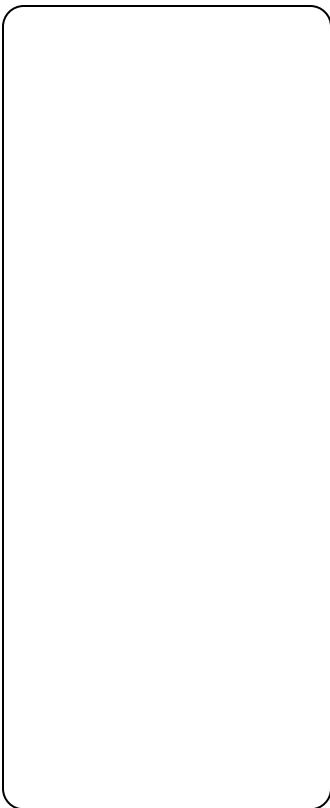


d. axis of symmetry

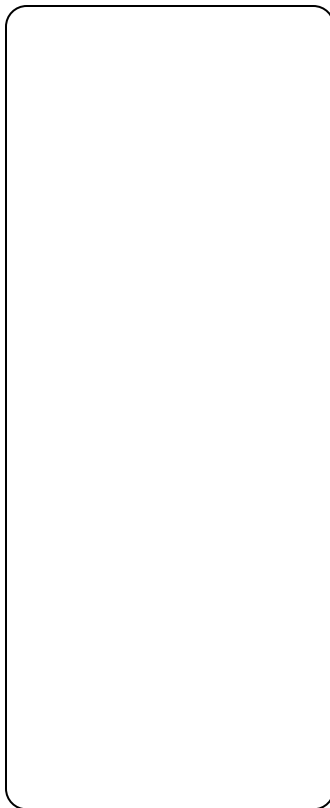


IV. What type of questions can you ask for the followings?

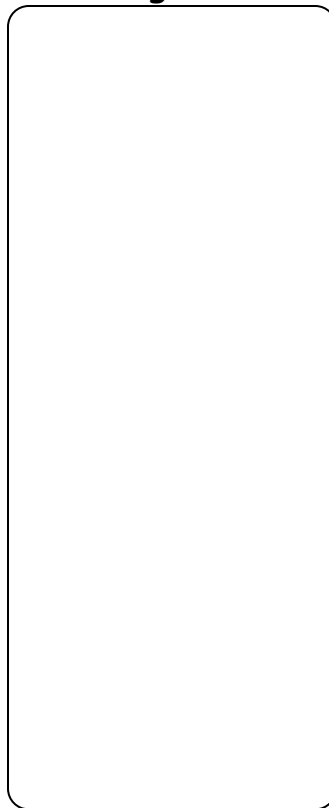
c. Vertex



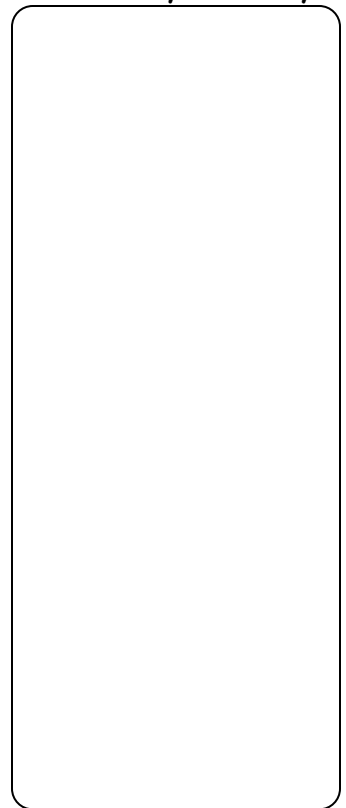
b. zero



c. height



d. axis of symmetry



Each path (20)

(3) Clear Path Drawn on the Graph

(2) Equation in Vertex Form

(2) Equation in Standard Form

(4) Word Problem

(2) Method (Factoring, Completion of Square, Formula, Vertex & A.O.S.)

(4) Correct Work

(3) Description in Words

4 questions for 4 birds

Application Problem using each of the following methods

-Factoring Method

-Completion of Square Method

-Quadratic Equation Formula

-Vertex & Axis of Symmetry

& Description in words

Each Path Described in Quadratic Equations

Vertex Form

Standard Form

(20) Colorful, Clear show of each path using different colors

Variety

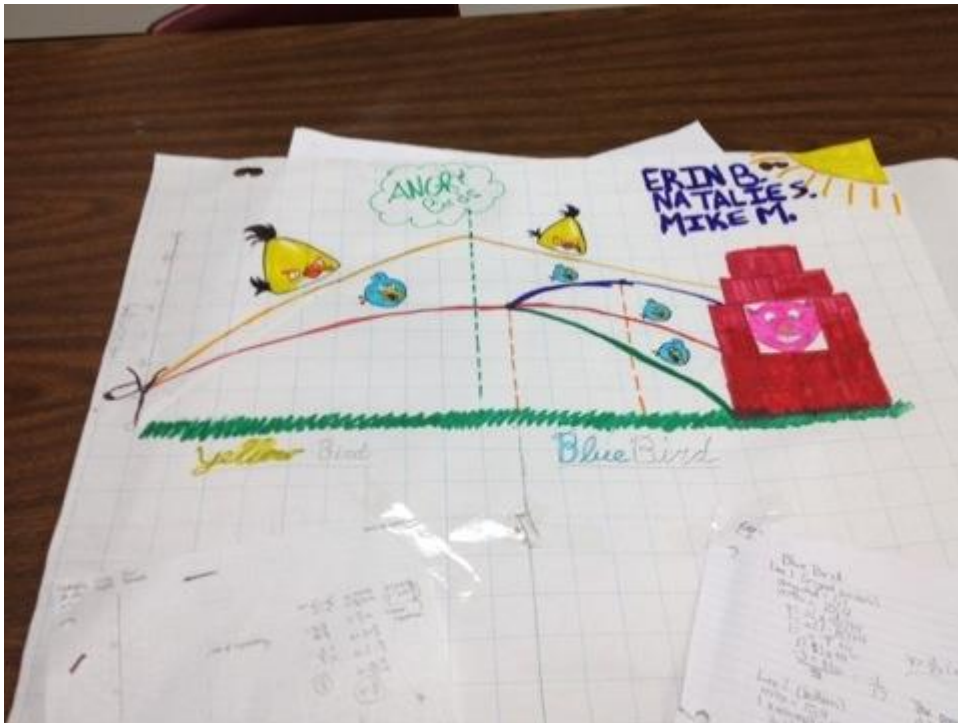
Creativity

Extra Effort

<https://s-media-cache-ak0.pinimg.com/736x/4c/2a/07/4c2a07c86630be5e047fde36dbb4475b.jpg>



<http://mrorr-isageek.com/wp-content/uploads/2012/04/20120427-213835.jpg>



<https://www.youtube.com/watch?v=kUgNmy-4RDM>

Angry Birds Game Set – examples of structures & show of how birds fly