**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Discovering Parabolas**

In this activity you will need to draw a sketch of the graph that three types of balls form when thrown between two group members. Each graph should be form a parabola, where the maximum height is the vertex of the parabola. You will need to find the two x-intercepts and the maximum value reached (this will be an estimated value).

1. First you will need to get into groups of 3 or 4 students.

2. You will measure 6 feet, 9 feet and 12 feet and mark with tape which is the distance you will be throwing the ball from one partner to the other. This will be the distance needed between your x intercepts.

3. Next you will throw the ball in a parabola shape and estimate the number of feet it reached. This will be your maximum value.

4. You will then repeat these steps with the same ball moving closer together and then farther apart.

5. Repeat this with all other balls.

6. At the end you should have tested a basketball, tennis ball, and football. Totaling up to 9 graphs.

7. In each graph make sure to label:

* **X axis (distance), y axis (height above waist level)**
* **axis of symmetry**
* **x intercepts**
* **maximum values**.

 **Basketball Parabolas:**

  

Distance Between: 12 feet Distance Between: 9 feet Distance Between: 6 feet

Maximum Height: \_\_\_\_\_\_ Maximum Height: \_\_\_\_\_\_\_ Maximum Height: \_\_\_\_\_\_\_

Line of symmetry: Line of symmetry: Line of symmetry:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Tennis Ball Parabolas:**

  

Distance Between: 12 feet Distance Between: 9 feet Distance Between: 6 feet

Maximum Height: \_\_\_\_\_\_ Maximum Height: \_\_\_\_\_\_\_ Maximum Height: \_\_\_\_\_\_\_

Line of symmetry: Line of symmetry: Line of symmetry:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Football Parabolas:**

  

Distance Between: 12 feet Distance Between: 9 feet Distance Between: 6 feet

Maximum Height: \_\_\_\_\_\_ Maximum Height: \_\_\_\_\_\_\_ Maximum Height: \_\_\_\_\_\_\_

 Line of symmetry: Line of symmetry: Line of symmetry:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which ball had the greatest vertex?\_\_\_\_\_\_\_\_\_\_
2. Which ball had the smallest vertex?\_\_\_\_\_\_\_\_\_
3. What variables affected the height of the ball? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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