Name _____ Date _____ Class _____

CHAPTER 9

Project

Free Falling

Activity 1: Objects in Motion *Use with Lesson 9-1*

In this activity, you will use a motion detector to investigate the height of a falling object.

1. Drop an object from a height of 10 feet. Use the motion detector to find the object's height above the ground over time. Record your results in the table.

Time (s)	Height (ft)

2. Use the time and height data to explain whether this is a quadratic function.

_____

3. Graph the function. Give the domain and the range.

4. The object's height y in feet above the ground after falling for t seconds is given by the equation $y = 16x^2 + h$, where h is the initial height in feet. Write an equation of this form to fit the data.

_____

5. Does the graph have a maximum or a minimum? Explain how you know.

_____

6. Estimate how long it takes the object to hit the ground.

_____

Name _____ Date _____ Class _____

CHAPTER 9

Project

Free Falling continued

Activity 2: Penny Toss *Use with Lesson 9-7*

How long would it take a penny to fall from the top of the world's tallest buildings?

1. Research and record the heights of the world's five tallest buildings.

Building Name and Location	Height (ft)

2. An object's height y in feet above the ground after falling for t seconds is given by the equation $y = 16x^2 + h$, where h is the initial height in feet. Use this equation to determine how long it would take a penny to drop from the top of each building. Round your answer to the nearest hundredth of a second.

_____

_____

3. For each building, approximate the height of the penny after 3 seconds.

_____

_____

4. For each building, find how long it will take the penny to fall to a height of 100 ft above the ground. Round your answer to the nearest hundredth of a second.

_____

_____

5. Make a graph showing the penny's height over time for the world's tallest building.