

QUADRATIC MODELS

PROBLEM 3: A FALLING OBJECT

An object is released and falls to the ground. Your goal is to investigate the object's fall as a function of the time it has been falling. Use a digital camera or motion detector and data collector.

- A. Determine and calculate an appropriate mathematical model that relates how far the object has fallen with the length of time it has been falling.
- B. Investigate the errors in the model, and make conjectures about their cause.
- C. Explore the differences in successive height measurements, and extend this investigation into looking at the differences of these differences. Discuss your findings.

EXTENSIONS

1. What would happen if you measure the height of the object from the ground, rather than the distance it has fallen?
2. Investigate the changes that occur if you use different objects.
3. Investigate any changes that happen if you gather your data outside instead of inside.

PROBLEM 4: DISCOVERING A FORMULA

You may or may not recall the formula for the number of diagonals in a polygon. To see if you can find it on your own, draw several polygons, complete the chart below, and see if you can derive it by using a quadratic model.

# of Sides	3	4	5	6
# of Diagonals	0			