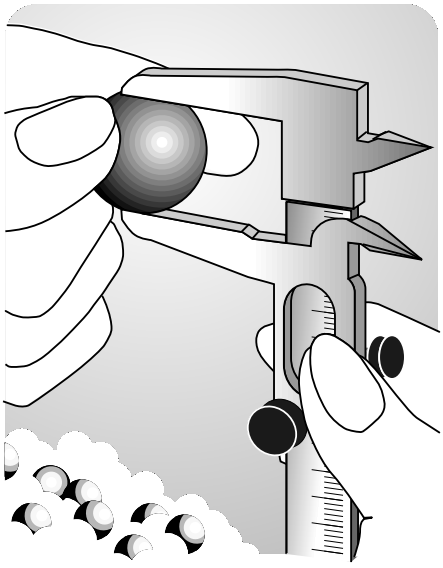
NAME _____ DATE _____

School-to-Career

(Use with Lesson 7-6)

Inspecting Ball Bearings



Suppose you are a manufacturing inspector for Rodriguez Metal Products. Rodriguez Metal Products manufactures washers, fasteners, and ball bearings. Your job is to monitor the quality of products and to ensure that parts are within *tolerance,* or allowable levels of variation in the dimensions of a product.

Production Line #1 is manufacturing ball bearings. Equipment operators on Line #1 report that they have been having some problems with the machinery during the first part of their shift. You have been assigned to inspect a sample of 5 mm ball bearings taken during this time. Using calipers, you have measured the diameter of each ball bearing in the sample and recorded it in the list below.

Ball Bearings from Production Line #1

Measured Diameter	Check if Acceptable	Measured Diameter	Check if Acceptable
5.03	√	5.04	√
5.11	√	4.79	√
4.89	√	5.01	√
5.08	√	4.96	√
4.97	√	4.73	
5.27		4.98	√
5.14	√	5.02	√
4.82	√	5.05	√
4.95	√	4.71	
4.97	√	5.01	√

1. These ball bearings are within tolerance if their diameters are within one-quarter millimeter of 5 millimeters.

a. Write an inequality involving absolute value to describe the range of acceptable diameters. $|x - 5| \leq 0.25$

b. Solve the inequality. $4.75 \leq x \leq 5.25$

c. Decide which ball bearings in the list are within tolerance, and find the percentage of acceptable ball bearings. 85%

2. The percentage of defective ball bearings produced by Production Line #1 is usually less than 5%. Do you think that the problems experienced on Line #1 during the first part of the shift has affected the quality of the ball bearings being produced? Explain your reasoning. Yes, the problems seem to be affecting quality because the defective rate is 15%, not less than 5%.