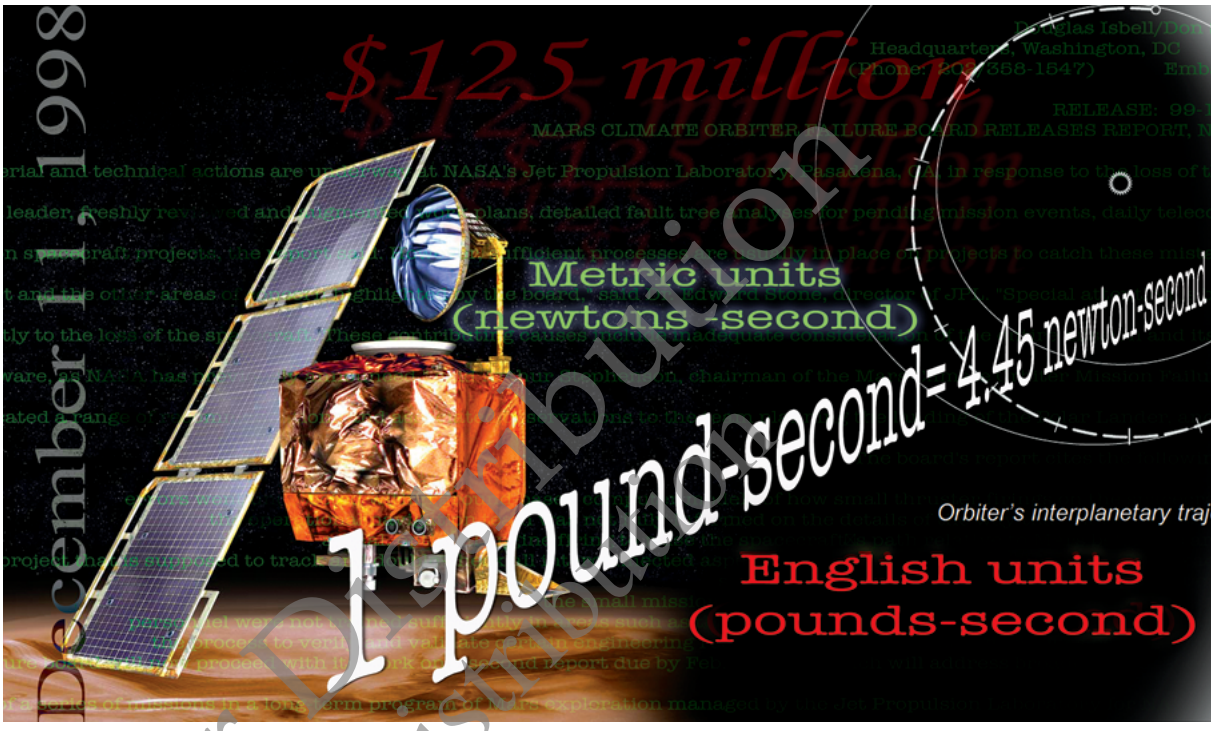
Pearson

Chapter E
Essentials: Units, Measurement, and Problem Solving



The $125 million Mars Climate Orbiter *was lost in the Martian atmosphere in 1999 because of a unit mix-up.*

> "The eternal mystery of the world is its comprehensibility."
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> —*Albert Einstein (1879–1955)*

QUANTIFICATION IS THE ASSIGNMENT of a number to some property of a substance or thing. For example, when we say that a pencil is 16 cm long, we assign a number to its length—we *quantify* how long it is. Quantification is among the most powerful tools in science. It requires the use of **units**, agreed-upon quantities

by which properties are quantified. We used the unit *centimeter* in quantifying the length of the pencil. People all over the world agree about the length of a centimeter; therefore, we can use that standard to specify the length of any object. In this chapter, we look closely at quantification and problem solving. Science would be much less powerful without these tools.