Module 1   Number Sense
Lesson 5   Estimation

Challenge Problems

1.5

Set 1

1 Explain Front-End Estimation and write and solve a problem that uses Front-End Estimation.

2 Explain compatible numbers and write and solve a problem that uses compatible numbers to make an estimate.

3 A case of nuts holds 24 twelve-ounce cans. About how many ounces of nuts are in 4 cases?

4 There are 46 passengers on a spaceship. Each passenger has 2 suitcases. The average weight of a suitcase is 32 pounds. The maximum weight of suitcases the spaceship can hold is 3,500 pounds. What is the approximate weight of the suitcases, and does the weight of the suitcases exceed the limit?

Possible Answers

Set 1

1. **Front-End Estimation is estimating using the front digits, the ones with the greatest place value.**

   Front-End Estimation problem:
   On Monday, Quim bounced a ball 108 times without stopping. On Tuesday, he bounced a ball 215 times with stopping. About how many times did he bounce the ball on the two days?

   Solution: With Front-End Estimation, only use the greatest place value.
   $100 + 200 = 300$. Quim bounced the ball approximately 300 times.

2. **Compatible numbers are numbers that are easy to work with mentally.**

   Problem:
   Doug's family is planning a vacation. They will travel 3,865 miles in 18 days. About how many miles will they have to travel each day?

   Solution: $4,000 \div 20 = 200$. Doug's family will travel about 200 miles each day.

3. **$24 \rightarrow 25, \quad 12 \rightarrow 10, \quad 25 \times 10 = 250$**
   $250 \times 4 = 1,000$
   About 1,000 ounces of nuts are in four cases.

4. **$32 \rightarrow 30, 30 \times 2 + 60, 46 \rightarrow 50$ and $60 \times 50 = 3,000$.**
   The suitcases weigh about 3,000 lbs and do not exceed the limit.