Unit 6, Lesson 25

Assess the Reasonableness of Solutions

Let's solve problems and assess the reasonableness of solutions.

Warm-up

Notice and Wonder: Native American Languages

What do you notice? What do you wonder?

Activity 1

Do You Speak Navajo?

1. In the list of the ten most widely spoken Native American languages in the U.S., Navajo and Yupik are the most widely spoken.

   a. How many more Navajo speakers are there than Yupik speakers? Explain or show your reasoning.

language	number of speakers
Navajo	166,826
Yupik	19,750
Dakota	17,855
Apache	13,445
Keres	13,190
Cherokee	11,465
Ojibwa	9,735
Choctaw	9,635
Zuni	9,615
Pima	6,990

   b. About how many times as many Navajo speakers are there as Yupik speakers? Explain or show your reasoning.

2. Navajo, Apache, and Cherokee languages have been used during wartime to help the U.S. military keep its communications secure.

   a. Based on the data here, how many people might have been able to understand the communications? Explain or show your reasoning.

   b. How do you know that your answer is reasonable?

3. Are there more Navajo speakers than the speakers of all the other nine languages combined? Show how you know.

Activity 2

Languages in Philadelphia and Chicago

Philadelphia is a diverse city and home to people of different backgrounds.

The table shows 2020 data on some languages spoken in Philadelphia and the numbers of people who speak them.

language	number of speakers in Philadelphia
English only	1,131,303
Spanish	159,343
Other Indo-European	81,924
Asian	77,706

1. Use the data to determine if there are more people in Philadelphia who only speak English or more people who speak a language other than English. Show how you know.

2. What is the difference between the number of people who speak only English and those who speak another language? Show how you know.

3. Chicago is a city with a similar population to Philadelphia.

   This table shows data on some types of languages spoken by people in Chicago.

language	number of speakers in Chicago
English only	1,634,103
Spanish	600,655
Other Indo-European	150,354
Asian	105,790

   a. How many more speakers of Spanish and other Indo-European languages are in Chicago than in Philadelphia? Explain or show your reasoning.

   b. How do you know your answer is reasonable?

Section D Summary

We solved problems that involve large numbers from different contexts using different strategies.

In the beginning, we saw at least five ways to find the product of 45 and 18: by multiplying and dividing in parts, using a series of equations, drawing diagrams, and more.

Later, we solved problems about measurements, with numbers up to four digits. We found that, often, the same problem could be solved using different operations.

For example, in the fitness challenge activity, Han took 32,550 steps in 7 days. We can find the number of steps he took each day by using multiplication (what number times 7 is 32,550?) or division (what is 32,550 divided by 7?).

We can also write different equations.

$$7 \times n = 32{,}550 \qquad 32{,}550 \div 7 = n$$

To find out how many steps Han had to take to reach a goal of 120,000 steps if he had 96,897 steps, we can use addition (what number must be added to 96,897 to make 120,000?) or subtraction (what is the difference between 120,000 and 96,897?).

$$96{,}897 + n = 120{,}000 \qquad 120{,}000 - 96{,}897 = n$$