Unit 4, Lesson 17

Apply Rounding

Let's round large numbers to learn about situations and solve problems.

Warm-up

Notice and Wonder: Plane Altitudes

What do you notice? What do you wonder?

plane	altitude (feet)
WN11	35,625
SK51	28,999
VT35	15,450
BQ64	36,000
AL16	31,000
AB25	35,175
CL48	16,600
WN90	30,775
NM44	30,245

Activity 1

Apart in the Air

1. Altitude is the vertical distance from sea level. Here are the altitudes of 10 planes.

plane	altitude (feet)	
WN11	35,625	
SK51	28,999	
VT35	15,450	
BQ64	36,000	
AL16	31,000	
AB25	35,175	
CL48	16,600	
WN90	30,775	
NM44	30,245	



Which planes are flying at about 30,000 feet? Explain or show your reasoning.

2. Planes flying over the same area need to stay at least 1,000 feet apart in altitude.

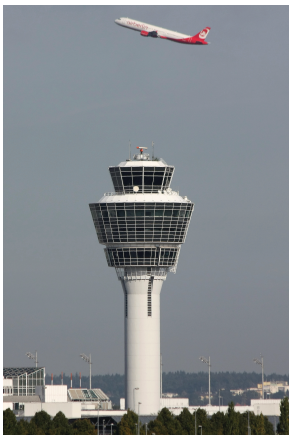
   Mai says that one way to tell if planes are too close is to round each plane's altitude to the nearest thousand. Do you agree that this is a reliable strategy?

   In the last column, round each altitude to the nearest thousand. Use the rounded values to explain why or why not.

Activity 2

Safe or Unsafe?

Use the altitude data table from earlier for the following problems.



1. Look at the column showing exact altitudes.
   a. Find 2 or more numbers that are less than 1,000 feet apart. Mark them with a circle or a color.
   b. Find another pair of numbers that are less than 1,000 feet apart. Mark them with a square or a different color.
   c. Based on what you just did, which planes are too close to one another?

2. Repeat what you just did with the rounded numbers in the last column. Use these numbers to find which planes are too close to one another.

3. Which set of altitude data should air traffic controllers use to keep airplanes safe while in the air? Explain your reasoning.

4. Are there better ways to round these altitudes, or should you not round at all? Explain or show your reasoning.

Activity 3

No Phone Zone?

In some countries, cell phone use is allowed on a flight only when the plane is at a certain altitude, usually around 40,000 feet.

Here are 6 planes and their altitudes.

plane	altitude (feet)
A	40,990
B	39,524
C	36,138
D	40,201
E	35,472
F	30,956

Jada says the passengers in all planes except for Plane F can use their phones.

Elena says only those in B and D can do so.

Do you agree with either of them? Explain your reasoning.

Section C Summary

We learned to compare, order, and **round** numbers up to 1,000,000.

We started by using what we know about place value to compare large whole numbers. For instance, we know 45,892 is less than 407,892 because the 4 in 45,892 represents 4 ten thousands and the 4 in 407,892 represents 4 hundred thousands.

Next, we found multiples of 1,000, 10,000, and 100,000 that are closest to given numbers—at first with the help of number lines, and later without. For example, for 407,892, we know that:

- 408,000 is the nearest multiple of 1,000.
- 410,000 is the nearest multiple of 10,000.
- 400,000 is the nearest multiple of 100,000.

Finally, we used what we know about finding nearest multiples to round large numbers to the nearest thousand, ten thousand, and hundred thousand.