Name _____

Enrichment
2-1

Mental Puzzles

Using mental math to add helps you find tens and hundreds.

1. Look at each number in the puzzle board. Find two numbers in the box whose sum equals that number. Use each number *only once*. Do not use paper and pencil or a calculator.

119	225	511	259	173	28
486	374	375	227	164	314
389	136	72	241	81	326

Puzzle Board		
100 ____ + ____	200 ____ + ____	300 ____ + ____
400 ____ + ____	500 ____ + ____	600 ____ + ____
700 ____ + ____	800 ____ + ____	900 ____ + ____

2. Explain what methods you used to help you solve the puzzle board.

_____

_____

_____

_____

Name _____

Enrichment
2-1

Mental Puzzles

Using mental math to add helps you find tens and hundreds.

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119	225	511	259	173	28
486	374	375	227	164	314
389	136	72	241	81	326

Puzzle Board		
100 72 + 28	200 119 + 81	300 164 + 136
400 227 + 173	500 241 + 259	600 375 + 225
700 326 + 374	800 486 + 314	900 511 + 389

2. Explain what methods you used to help you solve the puzzle board.

Check students' methods. Sample answer: I used mental math to break apart numbers. Then I counted on to find the addends.

Name _____

Enrichment
2-2

Family Vacation

The Bravo family is planning a family vacation.

- They plan to drive from New York City to Miami.
- They want to stop and spend some time in Washington, D.C.
- Mr. Bravo thinks they can drive about 62 miles an hour.

Distance between Cities

Cities	Miles
New York City to Washington, D.C.	237 miles
Washington, D.C. to Miami, Florida	1,043 miles

1. The family starts their trip on Monday morning at 9 A.M. They stop at noon for lunch. About how many miles have they traveled?

_____

2. Estimate how far the Bravo family is from Washington, D.C, at noon.

_____

3. After their one-hour lunch, the Bravo family continues driving to Washington, D.C. When they get there, they stop and do some sightseeing. At 5 P.M. they start driving again. At 7 P.M. they stop for dinner and check into a hotel. About how far did they travel past Washington, D.C.? About how far did the family drive on the first day of their trip?

_____

4. On the second day, the Bravo family drives from 7 A.M. until 5 P.M. During that time, they stop for a total of 2 hours. About how far did they drive on the second day of their trip?

_____

5. On the third day, the Bravo family must drive about 200 miles to reach Miami. They want to arrive in Miami by noon. If they leave at 10 A.M., will they arrive by noon? Explain.

_____

_____

Name _____

Enrichment
2-2

Family Vacation

The Bravo family is planning a family vacation.

- They plan to drive from New York City to Miami.
- They want to stop and spend some time in Washington, D.C.
- Mr. Bravo thinks they can drive about 62 miles an hour.

Distance between Cities

Cities	Miles
New York City to Washington, D.C.	237 miles
Washington, D.C. to Miami, Florida	1,043 miles

Sample answers are shown.

1. The family starts their trip on Monday morning at 9 A.M. They stop at noon for lunch. About how many miles have they traveled?

   About 180 miles

2. Estimate how far the Bravo family is from Washington, D.C, at noon.

   About 60 miles

3. After their one-hour lunch, the Bravo family continues driving to Washington, D.C. When they get there, they stop and do some sightseeing. At 5 P.M. they start driving again. At 7 P.M. they stop for dinner and check into a hotel. About how far did they travel past Washington, D.C.? About how far did the family drive on the first day of their trip?

   About 120 miles; About 360 miles

4. On the second day, the Bravo family drives from 7 A.M. until 5 P.M. During that time, they stop for a total of 2 hours. About how far did they drive on the second day of their trip?

   About 480 miles

5. On the third day, the Bravo family must drive about 200 miles to reach Miami. They want to arrive in Miami by noon. If they leave at 10 A.M., will they arrive by noon? Explain.

   No; Sample answer: To arrive by noon, they would have to drive 100 miles an hour. That is not reasonable.

Name _____

Enrichment
2-3

Use Your Head

Look at each problem and its sum. Without actually adding, decide whether or not the given sum is reasonable. Write ***Yes*** or ***No*** and explain your answer.

1.
$$\begin{array}{r} 224 \\ 303 \\ +\,125 \\ \hline 652 \end{array}$$

_____

_____

_____

2.
$$\begin{array}{r} 300 \\ 478 \\ +\,213 \\ \hline 991 \end{array}$$

_____

_____

_____

3.
$$\begin{array}{r} 324 \\ 156 \\ +\,615 \\ \hline 100 \end{array}$$

_____

_____

_____

4.
$$\begin{array}{r} 18{,}207 \\ 4{,}956 \\ +\,2{,}345 \\ \hline 101{,}217 \end{array}$$

_____

_____

_____

5.
$$\begin{array}{r} 131{,}058 \\ 20{,}790 \\ +\,18{,}903 \\ \hline 170{,}751 \end{array}$$

_____

_____

_____

6.
$$\begin{array}{r} 202{,}341 \\ 137{,}750 \\ +\,145{,}532 \\ \hline 80{,}623 \end{array}$$

_____

_____

_____

Name _____

Enrichment
2-3

Use Your Head

Look at each problem and its sum. Without actually adding, decide whether or not the given sum is reasonable. Write ***Yes*** or ***No*** and explain your answer. Sample explanations given.

1.
$$\begin{array}{r} 224 \\ 303 \\ +\ 125 \\ \hline 652 \end{array}$$

Yes; The answer should be close to 650.

2.
$$\begin{array}{r} 300 \\ 478 \\ +\ 213 \\ \hline 991 \end{array}$$

Yes; The answer should be about 1,000.

3.
$$\begin{array}{r} 324 \\ 156 \\ +\ 615 \\ \hline 100 \end{array}$$

No; The answer should be close to 1,100.

4.
$$\begin{array}{r} 18{,}207 \\ 4{,}956 \\ +\ 2{,}345 \\ \hline 101{,}217 \end{array}$$

No; The answer should be about 25,500.

5.
$$\begin{array}{r} 131{,}058 \\ 20{,}790 \\ +\ 18{,}903 \\ \hline 170{,}751 \end{array}$$

Yes; The answer should be close to 170,000.

6.
$$\begin{array}{r} 202{,}341 \\ 137{,}750 \\ +\ 145{,}532 \\ \hline 80{,}623 \end{array}$$

No; The answer should be about 500,000.

Name _____

Enrichment
2-4

What's Missing?

Solve for the missing values.

1. 35,617 – ◯ = 15,624 ◯ = _____

2. 196,783 – 89,564 = □ □ = _____

3. △ – 42,876 = 33,418 △ = _____

4. 252,891 – ◯ = 107,000 ◯ = _____

5. □ – 7,392 = 12,183 □ = _____

6. 94,784 – 33,587 = △ △ = _____

Use the values to subtract.

7. ◯ – △ = _____

8. △ – □ – ◯ = _____

9. ◯ – □ = _____

10. ◯ – □ = _____

Name _____

Enrichment
2-4

What's Missing?

Solve for the missing values.

1. 35,617 – ◯ = 15,624 ◯ = 19,993

2. 196,783 – 89,564 = □ □ = 107,219

3. △ – 42,876 = 33,418 △ = 76,294

4. 252,891 – ● = 107,000 ● = 145,891

5. ■ – 7,392 = 12,183 ■ = 19,575

6. 94,784 – 33,587 = ▲ ▲ = 61,197

Use the values to subtract.

7. ● – △ = 69,597

8. ▲ – ■ – ◯ = 21,629

9. ● – □ = 38,672

10. ◯ – ■ = 418

Name _____

Enrichment
2-5

Transportation Conclusions

Each person made a conclusion about the data in the table. Think about each person's conclusion. Do you agree? Explain.

Airports and Railways

Country	Number of Airports	Length of Railways (km)
Australia	455	47,738
Finland	148	5,741
France	501	29,085
Germany	554	47,201
Hungary	46	7,937
Japan	175	23,556
New Zealand	118	4,128

1. Kylie compared the length of railways in Australia and Japan. She concluded that Australia has 24,282 kilometers of railway more than Japan.

_____

_____

2. Franklin looked at the number of airports in Germany and Hungary. He concluded that Germany has 508 more airports than Hungary.

_____

_____

3. Theona concluded that France has 11,279 more kilometers of railway than Hungary, New Zealand, and Finland altogether.

_____

_____

Name _____

Enrichment
2-5

Transportation Conclusions

Each person made a conclusion about the data in the table.
Think about each person's conclusion. Do you agree? Explain.

Airports and Railways

Country	Number of Airports	Length of Railways (km)
Australia	455	47,738
Finland	148	5,741
France	501	29,085
Germany	554	47,201
Hungary	46	7,937
Japan	175	23,556
New Zealand	118	4,128

Sample answers are given.

1. Kylie compared the length of railways in Australia and Japan. She concluded that Australia has 24,282 kilometers of railway more than Japan.

   No, Kylie subtracted incorrectly. Australia has 24,182 kilometers more railway.

2. Franklin looked at the number of airports in Germany and Hungary. He concluded that Germany has 508 more airports than Hungary.

   Yes, Franklin subtracted correctly and his conclusion is correct.

3. Theona concluded that France has 11,279 more kilometers of railway than Hungary, New Zealand, and Finland altogether.

   Yes, Theona subtracted correctly and her conclusion is correct.

Name _____

Enrichment
2-6

Flying High

	Atlanta	Boston	Chicago	Dallas	Denver
Boston	946				
Chicago	606	867			
Dallas	721	1,555	796		
Denver	1,208	1,767	901	654	
Detroit	505	632	235	982	1,135

Use the air distance chart above to write a number sentence for each problem. Then solve.

1. How many more miles does it take to get from Denver to Atlanta than to get from Detroit to Atlanta and Chicago to Atlanta combined?

_____

2. Jorge flew from Dallas to Detroit, from Detroit to Denver, and from Denver back to Dallas. How many miles did Jorge fly altogether?

_____

3. Maria flew from her home city of Boston to Atlanta, back home to Boston, and then back to Atlanta. How many miles did she fly altogether?

_____

4. How many more miles is it to fly round-trip between Dallas and Boston than between Denver and Chicago?

_____

_____

Name _____

Enrichment
2-6

Flying High

	Atlanta	Boston	Chicago	Dallas	Denver
Boston	946				
Chicago	606	867			
Dallas	721	1,555	796		
Denver	1,208	1,767	901	654	
Detroit	505	632	235	982	1,135

Use the air distance chart above to write a number sentence for each problem. Then solve.

Sample answers are given.

1. How many more miles does it take to get from Denver to Atlanta than to get from Detroit to Atlanta and Chicago to Atlanta combined?

   $1{,}208 - (505 + 606) = 97$ mi

2. Jorge flew from Dallas to Detroit, from Detroit to Denver, and from Denver back to Dallas. How many miles did Jorge fly altogether?

   $(982 + 1{,}135) + 654 = 2{,}771$ mi

3. Maria flew from her home city of Boston to Atlanta, back home to Boston, and then back to Atlanta. How many miles did she fly altogether?

   $(946 + 946) + 946 = 2{,}838$ mi

4. How many more miles is it to fly round-trip between Dallas and Boston than between Denver and Chicago?

   $(1{,}555 + 1{,}555) - (901 + 901)$
   $= 3{,}110 - 1{,}802 = 1{,}308$ mi

Name _____

Math and Science Activity
2-6

Roller Coaster Ride

Did You Know? Any object that is in motion has energy. The energy of motion is called kinetic energy. There are three forms of kinetic energy—vibrational, rotational, and translational. The amount of kinetic energy an object has depends on the mass and speed of the object.

The table shows the speed and amount of kinetic energy of a roller coaster at various points on a track.

Use the information from the table to answer the questions below.

	Speed (miles per hour)	Kinetic Energy (joules)
Point A	10	5,000
Point B	55	195,312
Point C	75	340,312
Point D	60	227,813
Point E	40	101,250

1. At which point on the track does the roller coaster have the greatest speed?

2. At which point on the track does the roller coaster have the greatest amount of kinetic energy?

3. At which point on the track does the roller coaster have the least speed?

4. At which point on the track does the roller coaster have the least kinetic energy?

5. **Extension** Jonas says when the roller coaster is traveling 70 miles per hour, the kinetic energy is 350,000 joules. Do you agree? Explain.