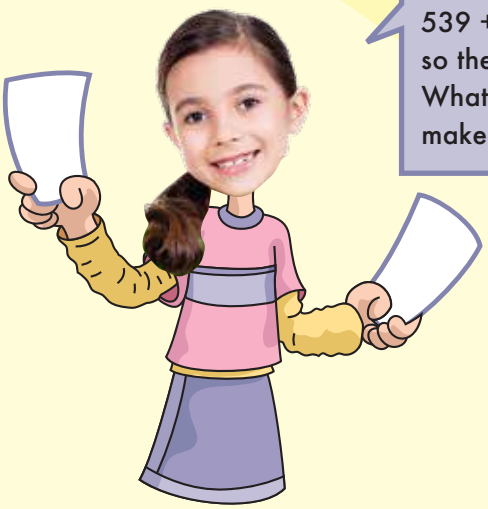
Digit Shuffle

You need ☑ a set of digit cards (1–9)

Activity One

Rachel and Ese are using 6 different digit cards to explore 3-digit numbers. They add these two numbers:

5 3 9 + 8 4 7



539 + 847. That's the same as 540 + 846, so they add up to 1386.
What if we swapped the digits around to make a larger total?

We could do 987 + 543. That's 1530. Is that the largest total we can get using these digits?

1. Use the 6 digits to make the largest total possible.
Compare your total with a classmate's.

2. a. Now add 623 + 547.
b. Shuffle the digits to find the largest total possible.

Where's the best place for the 2 largest digits?

c. How many ways can you find to make the largest total?

3. Choose another set of 6 different digit cards and make two 3-digit numbers with them. Experiment to find the largest total possible.

4. Write a set of instructions that explain how to get the largest total possible from two 3-digit numbers made from 6 different digit cards.

5. How would you change the instructions if you wanted to find the smallest total possible with 6 different digit cards? Check your prediction.

What kind of digits do I need in the hundreds places now?

6. Use a set of 1–9 digit cards. Shuffle them and lay them out to make three 3-digit numbers. Predict the largest and the smallest totals possible if you added them together.

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Activity Two

This time, again using 6 different digit cards, Rachel and Ese make a subtraction problem using two 3-digit numbers:

9 7 5 − 8 6 4

975 – 864 = 111. What if we swapped the digits around? Could we get a larger answer?

We could try 987 – 654. That makes 333.

1. Explore swapping the 6 digits around to find the largest result possible for a subtraction.

I wonder if we still want the largest digits in the hundreds places.

2. Choose another set of 6 different digit cards and make two 3-digit numbers with them. Experiment to find the largest result possible for a subtraction.

3. Write a set of instructions that explain how to get the largest result possible for a subtraction using two 3-digit numbers made from 6 different digit cards.

What did you notice about the first digit in your subtraction answers in questions 1 and 2?

4. Rachel and Ese are doing more subtractions using 6 different digit cards and two 3-digit numbers. They are now trying to find the result that is closest to, but greater than, 0.

I think we'll have to make the two numbers close to each other so that the difference between them is small.

What about 912 – 876? The difference is only 36.

Is 36 the smallest whole-number answer possible using these digits? How do you know?

Investigation

When you add a 3-digit number to another 3-digit number, the lowest answer is 200 and the highest number is ...

1. Is Ese right about 200?
2. What is the highest number possible?