



## It's Greater

### Why This Game or Puzzle?

Developing students' understanding of addition and subtraction, rather than having them merely apply rote procedures, is a complex goal. To achieve this goal, we must offer our students many opportunities to discuss their strategies and to recognize the relationships among the numbers in any addition or subtraction equation. As with any goal, it should serve as our focus as we steer students' talk about mathematics (Kazemi and Hintz 2014). Providing tasks that highlight such relationships gives students something to discuss.

In this game students draw cards randomly and write each number in an empty space on the *It's Greater* game board. The spaces represent digits in two-digit numbers, within expressions involving addition or subtraction. The goal is to have all sums and differences be as great as possible. In deciding where to write digits, therefore, players must think about the kind of numbers that will result in the greater sums or differences.

### Math Focus

- › Adding and subtracting two-digit numbers
- › Understanding where to place digits in addition or subtraction examples to get greater sums or differences

### Materials Needed

- › 1 *It's Greater* Game Board per team (page A-71)
- › 1 deck of *It's Greater* Cards, made from 2 copies of page A-72, per group
- › Optional: 1 *It's Greater* Directions per group (page A-73)

*It's Greater* Game Board

Name(s): \_\_\_\_\_ Date: \_\_\_\_\_

$$\square \quad \square + \square \quad \square = \underline{\hspace{2cm}}$$

$$\square \quad \square + \square \quad \square = \underline{\hspace{2cm}}$$

$$\square \quad \square - \square \quad \square = \underline{\hspace{2cm}}$$

$$\square \quad \square - \square \quad \square = \underline{\hspace{2cm}}$$

Not Using:

You receive 1 point each time your sum or difference is greater.

Score \_\_\_\_\_

## Directions

Goal: Place digits in the spaces of the game board to create expressions with the greater sums and differences.

- › Shuffle the cards and place them facedown in a deck.
- › Turn over the top card.
- › Each team separately decides in which of the twenty spaces on its board to write the number. Be sure to notice the four *Not Using* squares in which you can write numbers. Once you write a number, it cannot be changed. Then discard this card and turn over the next card.
- › Continue playing until you have filled all twenty spaces with a number.
- › Teams add and subtract to complete each of their equations.
- › Compare your answers to each problem. The team with the greater answer gets 1 point. The team with the most points wins.

## How It Looks in the Classroom

One teacher introduces this game using the numbers 0–9 written on letter-size paper. She asks four volunteers to come to the front of the room and each take a number randomly. Next, she asks them to stand in pairs to represent two numbers. The students have chosen the digits 1, 3, 6, and 9. The students with the digits 1 and 9 stand together, as do the students with 3 and 6. The teacher says, “You show the numbers 19 and 36. What is their sum?” She tells the observing students to also find the sum.

The students confirm that the sum is 55, and several students agree that the easiest way to find it is to think of  $19 + 1 + 35$ . Then the teacher asks how they might arrange these digits to form two-digit numbers with a greater sum. She tells them to write a number sentence to show the numbers and their sum. Again, all students are expected to respond. After a brief amount of time, she asks students to share their number sentences. The students suggest the following sentences:

$$\mathbf{91 + 36 = 127}$$

$$\mathbf{19 + 63 = 82}$$

$$\mathbf{91 + 63 = 154}$$

The teacher asks, “Which of these sums is greater than the other two sums?” They all agree it’s 154. The teacher does not want to engage students in a further conversation right now. She knows that after playing the game, more students will be able to contribute ideas about how to create numbers that are likely to have a greater sum.

The teacher distributes copies of the *It's Greater* game board to partners and explains how to play, making particular note of the *Not Using* squares. She calls out digits for them to write on their game boards, reminding them that once a digit is recorded, it cannot be erased and written elsewhere. When they complete a game, she has partners compare their boards with another set of partners to see whose sums and differences are greater.

The next day they will play the entire game in small groups (with two sets of partners in each group) and then discuss game strategy as a large group.

### Tips from the Classroom

- › Most students need to play a few rounds before they begin to think strategically. Provide the opportunity for such play, without leading their thinking.
- › Some students might not recognize, or might forget, that some examples involve addition and others, subtraction. You may want to suggest that they highlight the operation signs.
- › After a round of play, encourage students with different placements of numbers to share their thinking.

### What to Look For

- › Do some students appear to write numbers randomly? Do others seem to take quite a while to decide where to write a digit?
- › Do students recognize that 0 cannot be the first digit in a two-digit number?
- › What evidence is there that students plan ahead when they discuss where to write a number?
- › Do students think about how regrouping will impact the sum or difference they will get?

### Variations

- › Allow for a second round of play, when students get to change where they placed six of the numbers and refigure their answers and scores.
- › Have players play *It's Less*, trying to get the sums and differences that are less.
- › Make decks from three copies of page A-72 and have students play with game boards that have spaces for three-digit numbers and six *Not Using* spaces.

### Exit Question Choices

- › What reasons did you have for placing numbers in the *Not Using* spaces?
- › How does thinking about place value help you place the digits?

### Extension

Have students respond to the following journal-writing task.

*You have four digits to place in the following subtraction problem. Each digit is different. Tell where to write the digits to get the greatest difference. Tell where to write the digits to get the least difference. Explain your thinking.*

$$\boxed{\phantom{0}} \boxed{\phantom{0}} - \boxed{\phantom{0}} \boxed{\phantom{0}} = \underline{\hspace{2cm}}$$

***It's Greater Game Board***

Name(s): \_\_\_\_\_ Date: \_\_\_\_\_

$$\boxed{\phantom{00}} \quad \boxed{\phantom{00}} + \boxed{\phantom{00}} \quad \boxed{\phantom{00}} = \underline{\hspace{2cm}}$$

$$\boxed{\phantom{00}} \quad \boxed{\phantom{00}} + \boxed{\phantom{00}} \quad \boxed{\phantom{00}} = \underline{\hspace{2cm}}$$

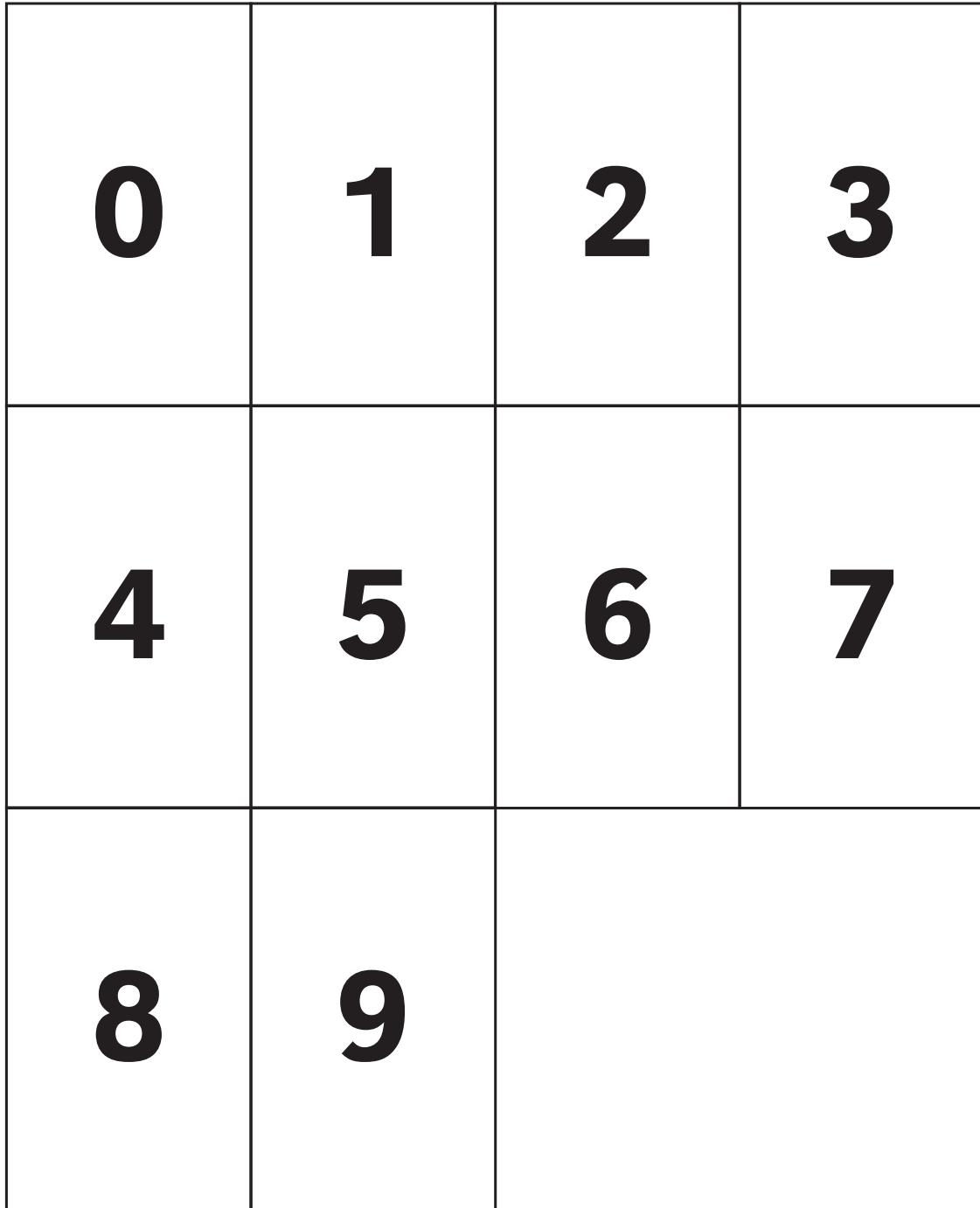
$$\boxed{\phantom{00}} \quad \boxed{\phantom{00}} - \boxed{\phantom{00}} \quad \boxed{\phantom{00}} = \underline{\hspace{2cm}}$$

$$\boxed{\phantom{00}} \quad \boxed{\phantom{00}} - \boxed{\phantom{00}} \quad \boxed{\phantom{00}} = \underline{\hspace{2cm}}$$

Not Using:    

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Score \_\_\_\_\_

***It's Greater Cards***

## ***It's Greater Directions***

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