

**Title:** Less is More: Subtraction in Action

**Grade Ranges:**

   X K-4

   5-8

   9-12

**Subject Tag:**

Math: Basic Math Skills

Math: Problem Solving

**Synopsis:**

This lesson describes small-group games based on different decks of cards. Each game is designed to reinforce concepts of subtraction with two-digit numbers. The games reinforce the following concepts: order in a number sentence, regrouping, and increased accuracy and speed. They can be used at the end of a subtraction unit, and they can be used throughout the year to keep students' subtraction skills sharp. Most of the games are not intended to be whole class activities, but they can be played by individual students or a small group while other students take part in other games or activities or finish class work.

**Keywords:**

subtraction, number sentences, borrowing, regrouping, digits, two-digit numbers

**Body:**

For the first four games, you will need to make a deck of cards as described below. For the games in which groups of cards in a deck must stay together, provide an ample number of paper clips, and train students to keep the cards in the sets of three in which they find them. You may also want to color-coordinate cards that go together. As students become familiar with the rules of each game, allow them to create additional decks of cards. This will allow more groups of students to play each game, as well as provide new challenges for students who have worked with all the cards in a deck.

### **1. Minus Madness**

*The deck:* Each card in this deck has a one or two-digit number. Group the cards into sets of three so that the numbers in each set make an accurate number sentence. (Ex. 8, 24, 32: The cards can be arranged to form the number sentences  $32-8=24$  and  $32-24=8$ .) Each deck needs 30 sets of three cards (90 cards total) in order for one to three students to work with at least 10 sets of cards a game.

*The game:* Students can compete against themselves or each other to arrange the cards in correct number sentences quickly and accurately.

### **2. "Hole" Number Subtraction**

*The deck:* Each card in this deck contains a number sentence with a value missing. (Ex.  $23-\underline{\text{HOLE}}=8$ ) The deck must contain 40 cards in order for one to four students to each get one card at a time and work with at least 10 cards a game. Laminate the cards so students can fill each hole using dry-erase markers.

*The game:* For each card a student draws from the deck, he or she must fill that card's "hole" with a whole number that correctly completes the sentence ( $23-\underline{\text{HOLE}}=8$ ; fill the HOLE with 15). Students can compete against each other to fill the most holes accurately.

### **3. Four's a Crowd**

*The deck:* Each card contains one number. Group the cards together in sets of four. Each set of four includes three numbers that make an accurate subtraction number sentence. The fourth number does not fit. This deck should contain 20 sets for a total of 80 cards, which allows one to two individuals or pairs of students to work with at least 10 sets of cards a game.

*The game:* Students must create and solve a subtraction problem in order to remove the fourth card from the deck. Ex. 50, 34, 16, 14: Because  $50-34=16$  and  $50-16=34$ , students should identify 14 as the "four's a crowd" card. Students in a small group can use the cards to compete with each other to identify the fourth card in the fastest time.

### **4. Misfit Math**

*The deck:* This deck contains two sets of 60 cards each. One set contains one incomplete number sentence such as  $44-\underline{\quad}=29$  on each card. The second set contains three numbers on each card: a fit for an incomplete number sentence and two misfits for the same sentence, in this case 54, 15, 25. (Keep the matching cards from each set together.) One of the two misfits (54) should be easily identifiable as a misfit because its value clearly is too great for the number sentence. Two of the numbers (15 and 25) should appear to be possible fits. Two sets of 60 cards will allow one to four students to work with at least 15 sets of cards a game.

*The game:* Given part of a number sentence, such as  $44-\underline{\quad}=29$ , students will read a sequence of three two-digit numbers (ex. 54, 15, 25). Point out to students that one of the three numbers "fits" into the number sentence correctly; the other two are "misfits." Also make sure students notice that one of the two misfits (54) is easily identifiable as a misfit because its value clearly is too great for the number sentence, while two of the numbers (15 and 25) appear to be possible fits. Challenge students to use this strategy: pick out the obvious misfit first, then they only have two numbers to choose from. To identify the fit, (15) students likely will need to plug each remaining number into the number sentence. Remind students that they will need pencils and paper for such work.

### **5. Borrowing Bee**

You or a student should proctor and judge this whole-class or small-group activity. In response to a subtraction problem given orally, each student should complete four tasks:

- write the problem on the board correctly;
- say precisely where or if borrowing is required;
- solve the problem correctly;
- say the number sentence completely and correctly.

Here is what a student, for example, who is asked to solve the problem “twenty-eight minus nineteen” should do:

- write “28-19” vertically;
- say “borrow from the tens”;
- solve the problem with the answer “9”;
- say “twenty-eight minus nineteen equals nine.”

Encourage other students to work along with the competing student silently. Make the problems progressively more difficult. To increase the level of difficulty, introduce three- and four-digit numbers.

### **Related Links:**

#### **Features:**

- Contains special education tips
- Quick Activity (less than 30 minutes; story starter)
- Requires Internet access for students to complete

#### **Objective:**

Students will subtract two-digit numbers by borrowing from the tens digit in a given problem.

#### **Standards:**

**NY: 3.3:** Students use mathematical operations and relationships among them to understand mathematics. **3.4:** Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships.

**NYC: A4a.** Learn from models. **A5a.** Work with others to complete a task. **M1a.** Adds, subtracts, multiplies, and divides whole numbers, with and without calculators.

**M6a.** Adds, subtracts, multiplies, and divides whole numbers correctly.

**CT: 1.** Number Sense. Students will use numbers to count, measure, compare, order, scale, locate and label, and use a variety of numerical representations to present, interpret, communicate and connect various kinds of numerical information. **2.** Operations. Students will add, subtract, multiply and divide with whole numbers, fractions, decimals and integers, and develop strategies for selecting the appropriate computational and operational methods for solving problems.

**NJ: 4.1:** All Students Will Develop The Ability To Pose And Solve Mathematical Problems In Mathematics, Other Disciplines, And Everyday Experiences. **4.2:** All Students Will Communicate Mathematically Through Written, Oral, Symbolic, And Visual Forms Of Expression.

**Prerequisite Skills:**

1. familiarity with using borrowing to subtract two-digit numbers

**Time Required:**

15-45 minutes (depending on how many activities you plan to use), or as little as five to 10 minutes during any class period

**Technology and Materials Needed:**

1. large, colored index cards
2. paper
3. pencils
4. lamination machine (optional)
5. dry-erase markers for students (optional)

**Assessment Criteria:**

1. Can students arrange three numbers to create a plausible subtraction problem?
2. Do students recognize when it is necessary to borrow during subtraction?
3. Can students borrow and regroup correctly?

**Recommended Lesson Plan Review Date:**

**Review Comments:**