

- www.harcourtschool.com/glossary/math_advantage/index.html
This multimedia math glossary offers illustrations and definitions for many mathematical concepts, individualized for grades 1 through 8.
- illuminations.nctm.org/LessonDetail.aspx?id=U41
The National Council of Teachers of Mathematics presents this unit plan entitled "Comparing Connecting Cubes." Through these nine lessons, students learn more about the processes and properties of subtraction.

Suggested Print Resources

- Cato, Sheila. *Subtraction*. Carolrhoda Books, Minneapolis, MN; 1999.
- Duke, Kate. *Twenty Is Too Many*. Dutton Children's Books, New York, NY; 2000. In this fictional story, students learn more about subtraction as they read about twenty guinea pigs in a small boat.
- Murphy, Stuart J. *Shark Swimathon*. HarperCollins, New York, NY; 2001. A shark swim team swims laps as students gain experience with double-digit subtraction in this story.
- Penner, Lucille Recht. *Lights Out!* Kane Press, New York, NY; 2000. Read this fictional story about a girl who keeps track of how many lights turn off in her apartment building using subtraction.

TEACHER'S GUIDE

Kristen Lovett Casel, M.S.

Curriculum Coordinator, Schlessinger Media

TITLES

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|-----------------------|-----------------------------|------------------|
| • Addition | • Gathering & Graphing Data | • Multiplication |
| • Decimals & Percents | • Geometry | • Number Sense |
| • Division | • Measurement | • Subtraction |
| • Fractions | • Money | • Telling Time |
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Subtraction

Grades K–4

We use math in everything we do, from catching a movie at the local theater to shopping at the grocery store! Because math is an important aspect of our everyday lives, it's crucial that students are fluent in mathematical thinking and communicating. In our ever-changing world, it's not enough for students to be able to perform calculations. Students need to be challenged to solve problems in creative ways, using various approaches. Enhancing students' mathematical understanding can help to unlock the secrets of the world around them.

Introduction

How many are left? How much more? How many are missing? Believe it or not, subtraction can give you the answers to each of these questions and many more! Useful strategies like counting back and knowledge of fact families can help students find the differences in subtraction number sentences. Separating groups with ease can make all of the difference!

Vocabulary

subtraction — An operation that tells about separating groups.

number sentence — Also known as an equation, a way to record a relationship between numbers. $7 - 2 = 5$ is a number sentence.

difference — The result of subtracting numbers. In $7 - 2 = 5$, 5 is the difference.

minus sign — The symbol in a number sentence that tells you that you are supposed to subtract. When you read $7 - 2$, you say, “seven minus two.”

equals sign — The symbol in a number sentence that tells you that the numbers on either side have the same value. In $7 - 2 = 5$, $7 - 2$ has the same value as 5.

fact family — A group of related math facts. For example, 2, 6 and 8 are members of a fact family because $2 + 6 = 8$, $6 + 2 = 8$, $8 - 6 = 2$ and $8 - 2 = 6$.

regroup — To name a number in a different way. For example, 62 is the same as **five tens and twelve ones**.

estimation — Finding a number that is reasonable for a situation.

Pre-viewing Discussion

- Discuss with students why they think subtraction is important. Help them to identify everyday situations in which they would need to use subtraction. What do students imagine would happen if they couldn't use subtraction?
- Subtraction can show how many are left, how many more and how many are missing. Help students to use manipulatives to demonstrate these types of problems. Discuss how they are similar and different.
- Encourage students to brainstorm a list of careers that require subtraction (e.g., architect, bank teller, accountant, etc.). Discuss why it's important for these people to be accurate when they subtract. What might happen if they subtracted incorrectly?

Follow-up Discussion

- Students can discuss why estimating differences is useful. When do they think estimating the answer of a subtraction problem is okay? When do they need an exact answer?
- Share a subtraction problem with your students that requires regrouping, such as $32 - 25$, and ask for different approaches to finding the difference. Discuss the nature of regrouping: what is it, and why does it work?

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- Discuss the relationship between addition and subtraction. How can knowing addition facts help with subtraction?

Follow-up Activities

- Play Tic-Tac-Toe Subtraction with your class! Make tic-tac-toe game cards with subtraction problems written in each of the cells. Students can work in pairs, and each pair should get a game card. Students can take turns solving problems. On a given turn, if a student solves the problem in the cell correctly, he can mark it with a counter. If he solves it incorrectly, his partner gets a chance. The first student in the pair to get tic-tac-toe wins! Then, pairs can rotate cards to play again.
- Tell your class a number between 0 and 19. In small groups, students can come up with as many subtraction number sentences as possible with that number as the difference. Students can take turns selecting the number.
- Create a subtraction card game for your students. For each pair of students, you'll need 36 cards with numbers from 1 to 18. Deal the cards evenly to two players. Students can flip them over. The student with the larger number on her card subtracts it from the smaller number on the other player's card. If she is right, she gets both cards. If she is wrong, her partner gets a chance, and can win both cards. After that turn, students flip over the next two cards until one student holds the entire deck.
- Encourage students to discover the members of an addition/subtraction fact family (e.g., 3, 5, 8). They can make triangles that have one member of the fact family in each corner. They can exchange their triangle with a partner, who then must write out the number sentences that represent that fact family (e.g., $3 + 5 = 8$, $5 + 3 = 8$, $8 - 3 = 5$, $8 - 5 = 3$).
- Share the rhyme found on the following Web site to help your students remember the rules of regrouping: www.eduref.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Mathematics/Arithmetic/ATH0024.html Encourage students to write their own helpful jingles to provide strategies for helping them tackle tough subtraction problems. These jingles can be written on posters and hung in the classroom to provide visual reminders when subtracting.
- Subtraction can tell us so much: how many are left, how many more and how many are missing. As a class, write thank you notes to the operation of subtraction, extolling its virtues.

Suggested Internet Resources

Periodically, Internet Resources are updated on our web site at www.LibraryVideo.com

- mathforum.org/
“Math Forum,” sponsored by Drexel University, contains a wealth of information about math for students and teachers. Students can tackle the “Problem of the Week,” or send a question to Dr. Math. Teachers can find lots of helpful resources for teaching math, including lesson plans.

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