

Grade 3 Clarifying Lessons: Make a Hundred

OLD Resources. These resources have NOT yet been updated to align with the revised elementary mathematics TEKS. These revised TEKS were adopted by the Texas State Board of Education in 2005, with full implementation scheduled for 2006–07. These resources align with the original TEKS that were adopted in 1998 and should be used as a starting point only.

What is a Clarifying Lesson?

A model lesson teachers can implement in their classroom. Clarifying Lessons combine multiple TEKS statements and may use several Clarifying Activities in one lesson. Clarifying Lessons help to answer the question "What does a complete lesson look like that addresses a set of related TEKS statements, and how can these TEKS statements be connected to other parts of the TEKS?"

TEKS Addressed in This Lesson

Number, operation, and quantitative reasoning: 3.1A, B; 3.3A; 3.5B

Underlying processes and mathematical tools: 3.15D; 3.16A, B; 3.17A

Materials

- overhead base-ten materials, recording sheet and hundred grid transparencies, and overhead calculator (if available)
- base-ten materials
- dice (one per group)
- recording sheet
- hundred grid
- calculators

Lesson Resources

Family Math by Jean Kerr Stenmark
Uncovering Mathematics with Manipulatives and Calculators, Levels 2 and 3 by Jane F. Schielack and Dinah Chancellor

Lesson Overview

Students roll a die seven times, each time determining whether to add that number of tens or that number of ones to try to make a sum as close to 100 as possible without going over.

Mathematics Overview

Students use the concept of place value, models of addition, and knowledge of basic addition facts to make decisions in a game.

Set-up (to set the stage and motivate the students to participate)

1. Ask students, "If you rolled a die exactly 7 times, what is the largest sum you could make? (Could you make 100?) What if each number represented that many 10's?" (3.5B)
2. Explain the game: Players must roll exactly 7 times and place each digit rolled in either the ones or tens place to make a sum less than 100. (3.1A, B; 3.16A)
3. Model the game on the overhead as a student rolls two or three times:

Write the number from each roll in the ones or tens column on the recording sheet (wherever the class decides). (3.1A, 3.3A, 3.16A)

Show the amount by laying the base-ten blocks on the hundred grid. (3.3A, 3.16A)

Record the addend on the calculator. (After the first roll, add each addend to the previous ones and show the sum on the calculator.) (3.15D, 3.16A)

4. Have students play the game at least three times, looking for strategies to play better each time. (3.17A)

Teacher Notes (to personalize the lesson for your classroom)**Guiding Questions (to engage students in mathematical thinking during the lesson)**

- How did you decide to place this digit in the ones place? The tens place? (3.1A, B; 3.3A; 3.16A)
- What does the recording sheet keep track of for you that the calculator doesn't? (the individual addends, so you can go back and try the same game again) (3.3A, 3.15D)
- What do the base-ten blocks on the hundred grid show that the calculator and recording sheet don't? (how far it is to 100, to help you decide whether to place a roll in the ones or tens) (3.1A, B; 3.15D)
- What does the calculator help you do? (keep track of the total) (3.5A, 3.15D, 3.16A)
- How does your sum affect your strategy as you play? (3.5A, 3.15D)

Teacher Notes (to personalize the lesson for your classroom)

Summary Questions (to direct students' attention to the key mathematics in the lesson)

To encourage students to reflect on their use of mathematics for decision-making during the game, ask questions such as:

- How did you use the (calculator, recording sheet, base ten model) to help you decide what to do next in the game? (3.1A, B; 3.3A, 3.5A, 3.15D)
- What strategies did you use? (3.16B)
- How did your strategies change as you played more games? How did your strategies change within a game? (3.15D; 3.17A)
- How would you change your strategies for the next game you played? Why? Play two more games to test your strategies. What refinements would you make based on this new information? (3.17A)
- What if you did not have to roll exactly 7 times in the game? What if you could roll fewer than 7 times? How would that affect your strategies? What if you could roll more than 7 times? How would that affect your strategies? (3.17A)

To have students use their knowledge of place value and addition to analyze the possible results of the games they played, ask questions such as:

- How close did you get to 100?
- Is there any game that you played that could have made a sum of 100 if you rearranged the digits? Use your recording sheet and calculator to find out. (3.1A, B; 3.3A; 3.5A; 3.15D; 3.16A)

Teacher Notes (to personalize the lesson for your classroom)

Assessment Task(s) (to identify the mathematics students have learned in the lesson)

- Have students find the game they played that would have gotten them closest to 100 if they had placed the numbers differently.
- Have students make up sets of 7 rolls that would add up to exactly 100 and post them on the class bulletin board. Challenge them to see how many different ones they can find.
- Have students write a summary statement of what they learned from the game.

- Have students graph scores from first games, second games, and third games to see if strategies improved the range of scores. (Were scores on third games closer to 100 than those on first games?)
- Present a hypothetical game--show sum on calculator, recording sheet, and base ten model. Ask students to analyze the game. Do they agree or disagree with the way it was played, what to do next, etc.? Students can record their analyses in their math journals.

Teacher Notes (to personalize the lesson for your classroom)

Extension(s) (to lead students to connect the mathematics learned to other situations, both within and outside the classroom)

- Students can play the game with polyhedral dice other than cubes and see if their strategies need changing.
- Students can make up a set of 7 rolls that would equal exactly 100. They can record all they find and look for patterns.
- Students can revise the game to include the hundreds place and roll to try to make a sum of 1000.

Teacher Notes (to personalize the lesson for your classroom)