

## Subitizing with the Rekenrek

Pre-K–Grade 1

### Mathematical Value

- Developing number sense and quantity recognition
- Understanding numbers within 10 and 20
- Recognizing composed and decomposed numbers

### Goal

Students recognize quantities without counting, using structure to “see” numbers.

### Materials

20-bead or 100-bead rekenrek

### Launch

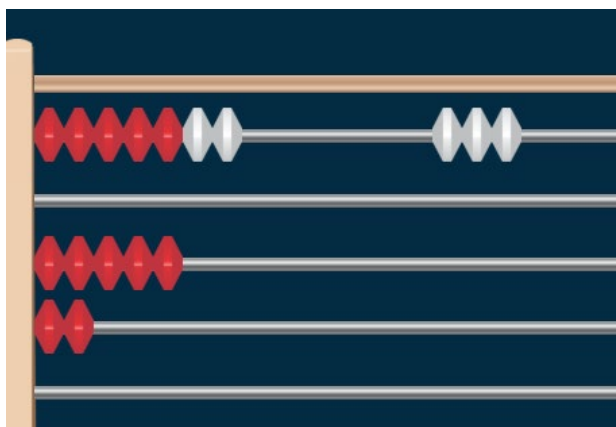
Show a quantity on the rekenrek for just a few seconds, then cover it. Ask: *How many did you see? How do you know?*

### Explore

Students describe numbers using the bead structure. For example, they may see 7 as 5 red and 2 white, or as 3 less than 10.

### Discuss

Highlight how the 5-and-5 structure supports quick recognition and flexible thinking.





## Counting Forward, Backward, and Beyond

### Kindergarten–Grade 2

#### Mathematical Value

- Counting forward and backward within 100
- Counting on from a given number
- Skip counting by 5s and 10s

#### Goal

Students build flexible counting skills to support operations.

#### Materials

20-bead or 100-bead rekenrek

#### Launch

Start at 1, slide 1 bead at a time, and invite students to count aloud. Start at 10 or 100, and count backwards.

Start with a number already shown on the rekenrek and ask: *What comes next? What came before?*

Count on and back from any number. Focus on decade changes such as 29, 30, 31.

Count by tens by sliding 1 row at a time. Repeat with by fives.

#### Explore

Students count forward and backward, skip count, and count on from any number.

#### Discuss

Emphasize counting as a telling, “How many” in relation to a quantity.

## Base Ten Relationships

Grade 1–Grade 2

### Mathematical Value

- Understanding place value concepts
- Composing and decomposing tens and ones
- Representing two-digit numbers using place value

### Goal

Students understand how ones, tens, and 1 hundred are composed.

### Materials

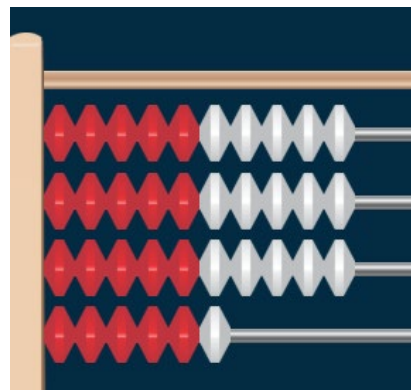
100-bead rekenrek

### Launch

Show one full row and ask: *What does this represent? (10 or 1 ten)*. Continue to 90.

Show one or more full rows and part of a row and ask: *How many tens? How many ones? What number does this represent?*

Show 10 full rows and ask: *What does this represent? (100 or 10 tens)*.



### Explore

Partners build and name numbers using rows (tens) and individual beads (ones).

### Discuss

Connect visual groupings to numbers in standard and expanded forms.

## Partners to 10 and 100

Kindergarten–Grade 1 (partners to 10)

Grade 2–3 (partners to 100)

### Mathematical Value

- Understanding part-whole number relationships
- Developing fluency with addition and subtraction
- Identifying benchmark numbers

### Goal

Students identify number pairs that make 10 or 100.

### Materials

20-bead or 100-bead rekenrek

### Launch (choose grade appropriate options)

Show part of a row and ask: *How many more to make 10?*

Show one or more rows and ask: *How many more tens to make 100?*

Show some full rows and part of a row and ask: *How many more to make \_\_ (the next ten)?*

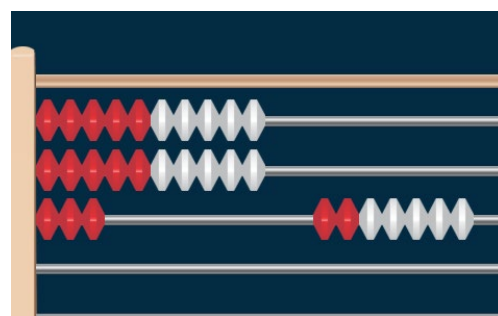
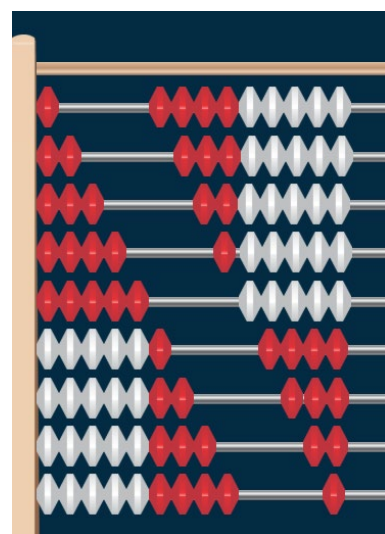
*How many more to make 100?*

### Explore

Invite partners to manipulate beads to complete rows and sets.

### Discuss

Highlight how seeing what's missing and leveraging benchmark numbers strengthens mental math.



## Addition and Subtraction Strategies

Grades 1–3

### Mathematical Value

- Adding and subtracting within 100 accurately
- Using place value strategies and properties of numbers to solve problems
- Developing mental math and efficiency

### Goal

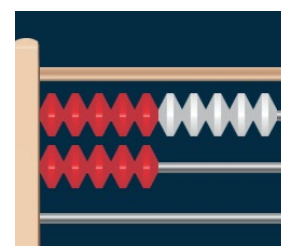
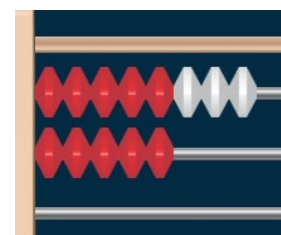
Students learn the make ten addition and take from 10 subtraction strategies.

### Materials

20-bead or 100-bead rekenrek

### Launch

Model an addition problem such as  $8 + 7$ . Show 8 with beads on the top row and 7 beads on the row below. Ask, “What does 8 need to make 10?” (2) Then ask, “Where can we get 2?” (from the 7). Slide 2 away from the 7 and slide 2 beads to make 10 with 8. Finally, ask, “What 10 plus fact do you see?” ( $10 + 5 = 15$ ). Invite students to solve other problems within 100 using a make the next ten strategy.



### Explore

Show a teen number on the top row and ask students to take 5, 6, 7, 8, or 9. They may take away one at a time, they may take all the ones (white beads) at once, or they may take from the ten (red beads) and add the parts left.

### Discuss

Talk about making problems easier by breaking them up and using benchmark tens.

## Equal Groups and Arrays

Grades 2–3

### Mathematical Value

- Understanding multiplication as equal groups
- Representing division through sharing and grouping
- Using the distributive property as strategy to solve problems

### Goal

Students model multiplication and division using equal groups.

### Materials

100-bead rekenrek

### Launch

Model a multiplication expression with equal groups of beads in rows. Ask students to share the equation, including the product (total). Relate each number to the rekenrek representation. Have students model and solve more multiplication problems.

### Explore

Ask students what other equations the equal rows of beads could represent, including the turn around fact and division equations.

### Discuss

Connect visual decomposition to the distributive property. Students use equal rows of red and white to form arrays and decompose factors using bead color. For example,  $5 \times 7$  can also be seen as  $(5 \times 5) + (5 \times 2)$ .



## Rounding to the Nearest Ten

Grades 4 – 5

### Mathematical Value

- Rounding whole numbers to the nearest ten
- Using place value and number lines
- Reasoning about numerical distance

### Goal

Students reason about rounding using proximity to benchmark numbers.

### Materials

100-bead rekenrek

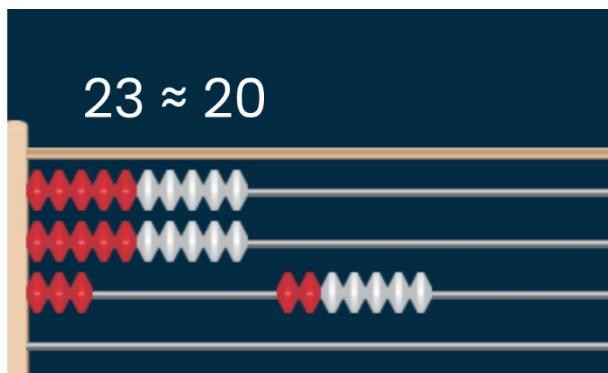
### Launch

Show a 2-digit number and ask which 2 tens it is between. Then ask which one it is closer to, and how they know.

### Explore

Students try various numbers and develop “rules” for rounding. Be sure to include numbers with “5” in the ones place.

Consider connecting the rekenrek to a beaded or regular number line.



### Discuss

Reinforce rounding rules as a reasoning process based on distance from a benchmark number. Talk about 5 as a special case, where a general agreement is applied. Consider discussing situations when rounding a number is useful (or not).

## Decimals on the Rekenrek

Grade 3–5

### Mathematical Value

- Understanding decimals as parts of a whole
- Represent decimal quantities
- Explain the place value of digits in a decimal

### Goal

Students model tenths and hundredths using model.

### Materials

100-bead rekenrek

### Launch

Define the whole rekenrek as 1. Ask what a row of beads represents (one-tenth, or 1 part of 10 parts). Ask what a bead represents (one-hundredth, or 1 part of 100 parts). Represent various decimals with tenths only, hundredths only, then tenths and hundredths.

### Explore

Connect the bead representations to standard form, written form, fraction form, and expanded form.

### Discuss

Reinforce the value of each digit in a decimal number. Consider comparing numbers such as 7, .7 and .07 to help students understand the quantities.

