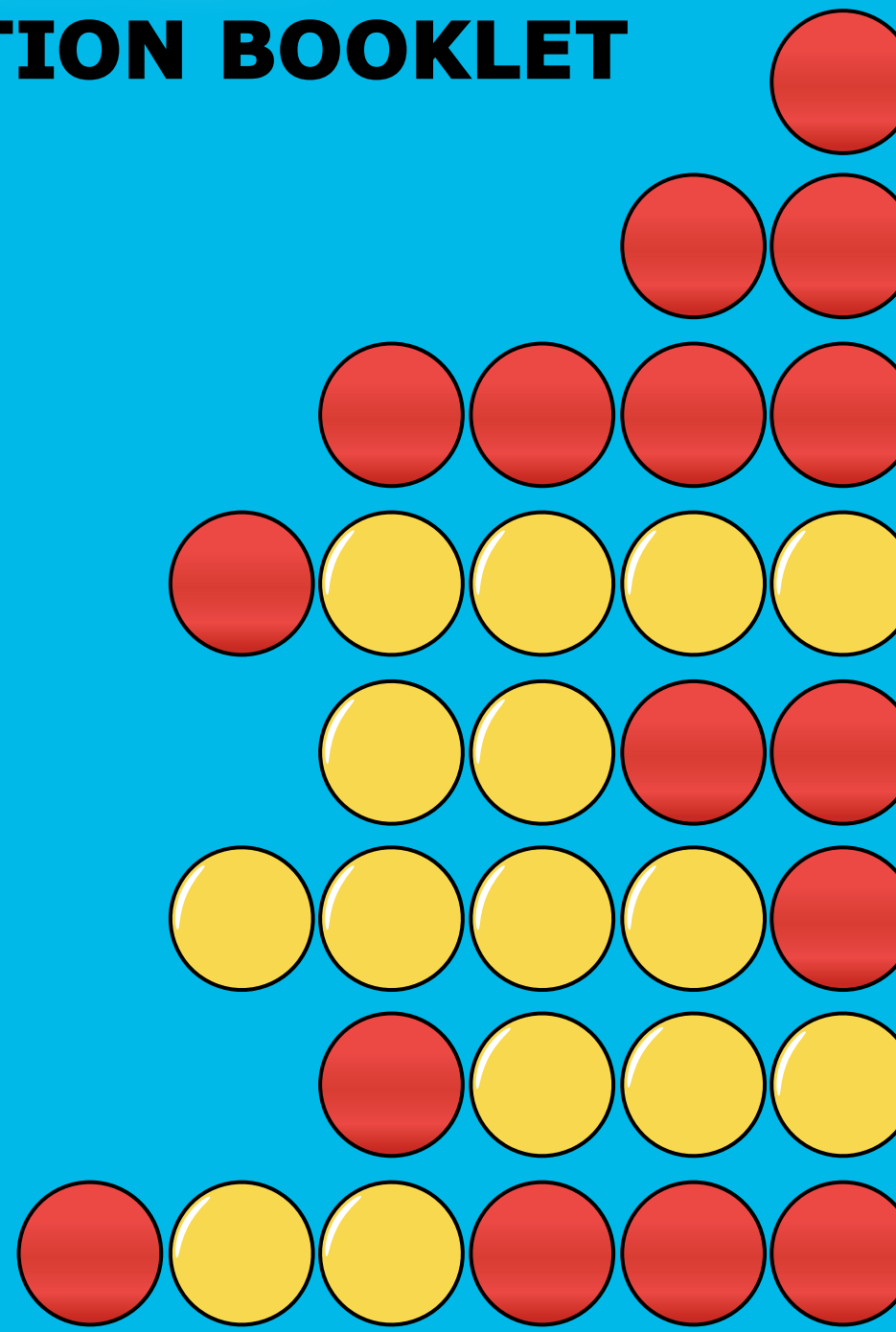
EZeeCOUNT Abacus™

INSTRUCTION BOOKLET



EZeeCOUNT Abacus™

INSTRUCTION BOOKLET

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EZeeCOUNT Abacus: Instruction Booklet

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EZeeCOUNT Abacus™

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The original **EZeeCOUNT**™ was developed by Zeenat Begam Binti Khadim Hussain/Zeenat H. Durrani and manufactured in Malaysia. The APH version of the **EZeeCOUNT Abacus** is specially designed with two-textured beads (smooth versus rough/wavy) and a larger frame to accommodate the learning needs of students with visual impairments and blindness.

EZeeCOUNT Abacus™

ACKNOWLEDGEMENTS

The American Printing House for the Blind (APH) would like to thank the following teachers for field testing the prototype of the **EZeeCOUNT Abacus**. Their feedback guided and influenced the final product design.

Anita Bajenio, Teacher of the Visually Impaired, Kansas

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Cristina Di Lullo, Teacher of the Visually Impaired, Ohio

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Debra Duby, Teacher of the Visually Impaired, Arizona

Carla Harrison, Process Coordinator, Missouri

Brittany Koresch, Teacher of the Visually Impaired, Illinois

Elizabeth Lawlor, Teacher of the Visually Impaired, Kansas

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Julie McEnderfer, Teacher of the Visually Impaired, Washington

Erin Meyer, Teacher of the Visually Impaired/Orientation and Mobility Instructor, Missouri

Elizabeth Schomerus, Teacher of the Visually Impaired, Nebraska

Louise Whitworth, District Teacher of the Visually Impaired, Missouri

Katherine Wilson, Teacher of the Visually Impaired, Texas

Special thanks, too, to the **63** students who used the **EZeeCOUNT Abacus** during field testing.

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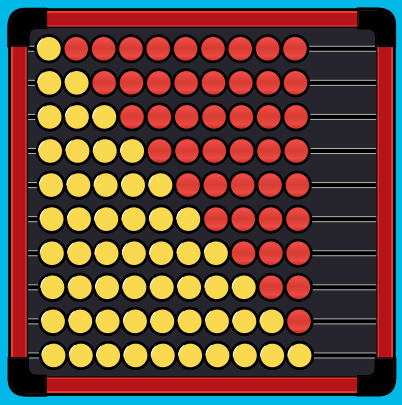
OVERVIEW



The **EZeeCOUNT Abacus** presents a 10 x 10 matrix of beads. The beads can be flipped and distinguished apart by color (red versus yellow) and/or texture (wavy/rough versus smooth) by students with visual impairments and blindness. Each row of beads slides along an elastic band from left to right against the black background of the frame. The reverse side of the abacus has a white, dry-erasable surface.

This Instruction Booklet provides examples of how the **EZeeCOUNT Abacus** can be used to facilitate a variety of concepts and activities including the following:

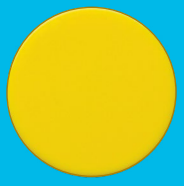
- Counting
- Addition
- Number Combinations
- Subtraction
- Multiplication
- Division
- Fractions
- Patterns
- Graphs
- Place Value
- Games

Getting Started

Before using the **EZeeCOUNT Abacus** for any of the activities highlighted in this Instruction Booklet, allow the student to practice the following:

- Flipping the beads from one side to the other
- Recognizing and describing the texture differences between the beads

  The red side of each bead is rough and wavy. 

  The yellow side of each bead is smooth**.** 

- Sliding the beads from the left side of the frame to the right side of the frame. When sliding the beads, practice abacus terminology. For example, when the beads are moved to the right side of the frame they are "set," and when the beads are moved to the left side of the frame they are "cleared."

- Counting the number of rows and columns of beads

The **EZeeCOUNT Abacus** should be placed on a secure, flat working surface during use. If needed, place a non-skid pad (e.g., Dycem® shelf-liner) underneath the abacus for added stability.

EZeeCOUNT Abacus™

COUNTING

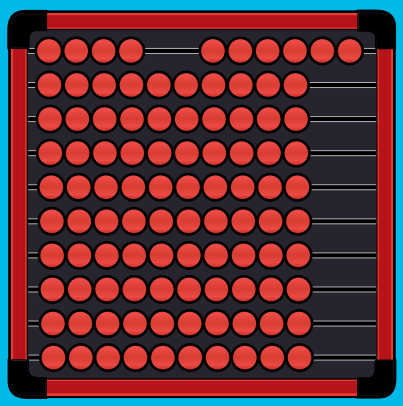
Use the **EZeeCOUNT Abacus** to perform counting tasks.

Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.
- Position the **EZeeCOUNT Abacus** in front of the student so that the beads are moved from left to right across the frame as they are counted.
- Move from the top row to the bottom row as the beads are counted. The top row represents numbers 1-10, the second row 11-20, the third row 21-30, and so forth.
- Count aloud as each bead is moved to the right side of the frame.

Example 1: Count to 6.

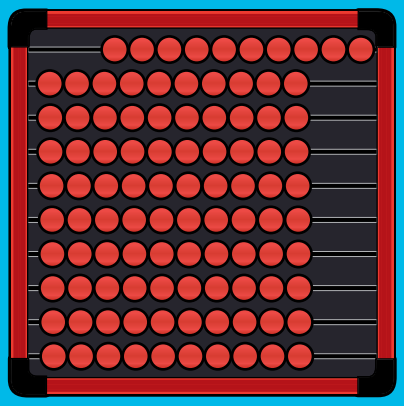
Slide 6 red wavy/rough beads to the right side of the frame. Count aloud as each bead is moved.



Example 2: Count to 25.

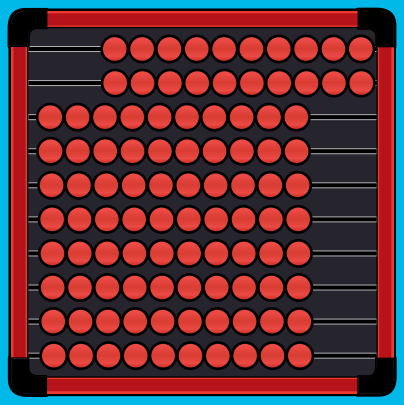
Step 1:

Slide 10 beads in the top row to the right side of the frame.



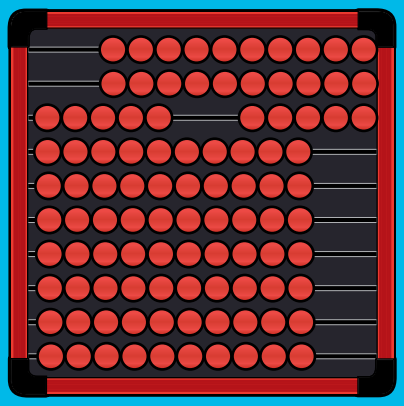
Step 2:

Slide 10 beads in the second row to the right side of the frame.



Step 3:

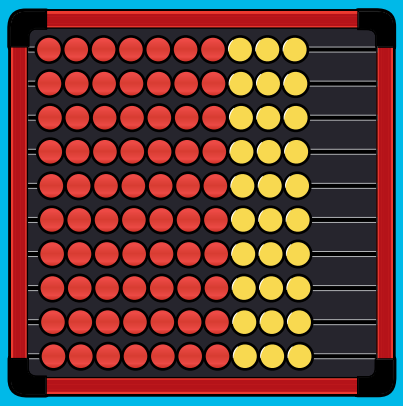
Slide 5 beads in the third row to the right side of the frame to reach a total of **25**.



Example 3: Count by 3's.

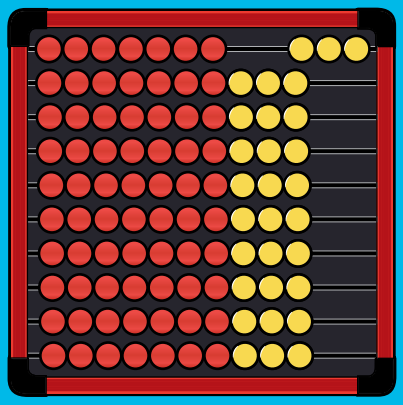
Step 1:

The instructor pre-flips a designated group of beads (i.e., three beads) to the opposite color and texture (yellow/ smooth) at the end of each row.



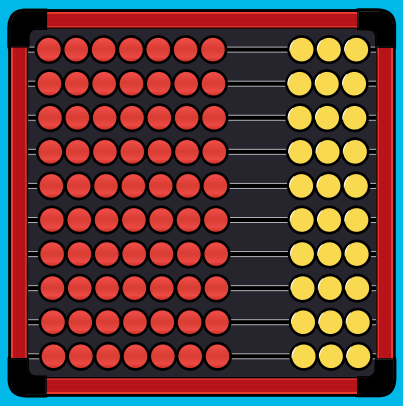
Step 2:

The student counts the number of flipped beads in the first row and slides all of them as a group to the right side of the frame. When the beads reach the other side, the student announces, "Three."



Step 3:

The student continues counting, adding onto the previous row (i.e., 6, 9, 12, etc.) as beads are moved as a group within each row to the right side of the frame. When the last group of beads is moved in the bottom row, the student announces "30."



EZeeCOUNT Abacus™

ADDITION

Use the **EZeeCOUNT Abacus** to perform addition tasks.

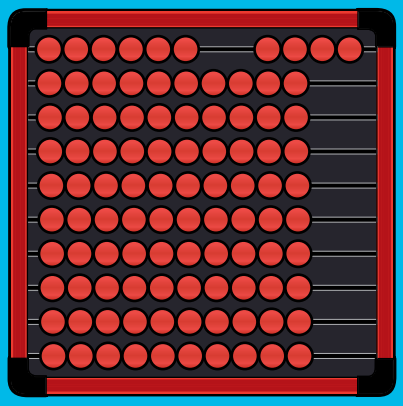
Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.
- Position the **EZeeCOUNT Abacus** in front of the student so that beads are moved from left to right across the frame.

Example 1: 4 + 2 = ?

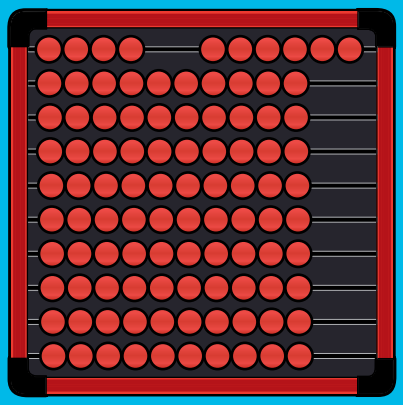
Step 1:

Slide 4 red wavy/rough beads in the top row to the right side of the frame.



Step 2:

Add 2 by sliding two red wavy/rough beads in the same row to the right side of the frame.



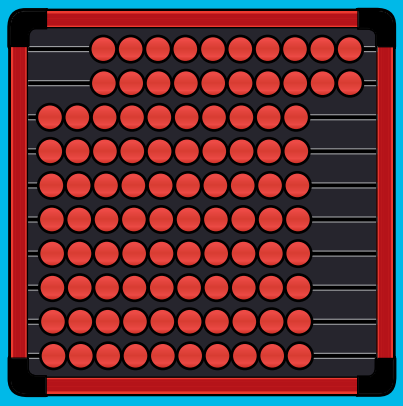
Step 3:

Count all of the beads moved to the right side of the frame to arrive at the answer **6**.

Example 2: 20 + 11 = ?

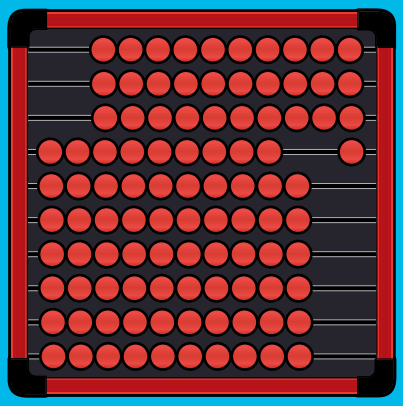
Step 1:

Slide 10 red wavy/rough beads in both the first and second rows to the right side of the frame to set **20**.



Step 2:

Add 11 by sliding 10 red wavy/rough beads in the third row and 1 red wavy/rough bead in the fourth row to the right side of the frame.



Step 3:

Count all of the beads moved to the right side of the frame to arrive at the answer **31**.

NUMBER COMBINATIONS

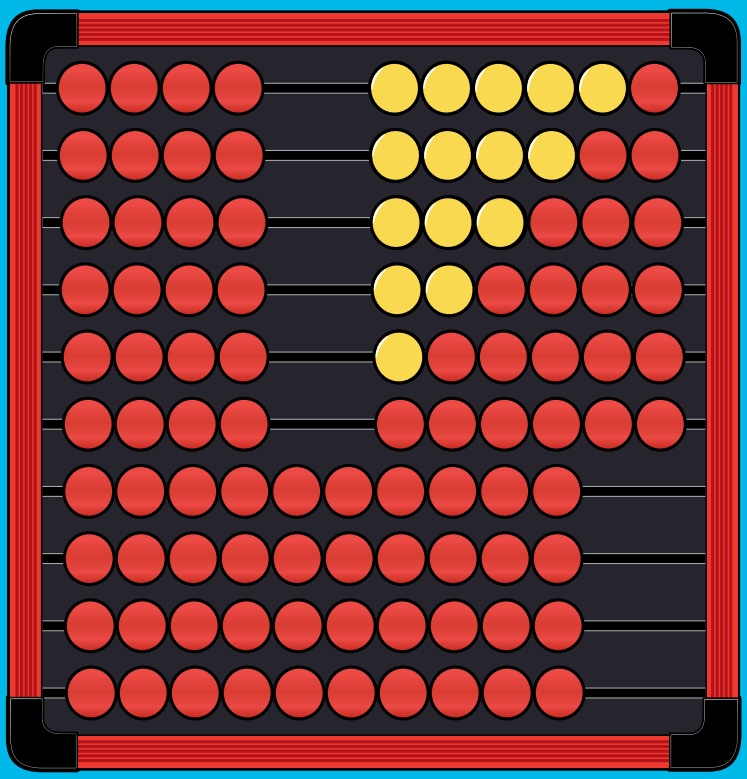
Use the **EZeeCOUNT Abacus** to demonstrate various number combinations that equal the same value.

Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.
- Position the **EZeeCOUNT Abacus** in front of the student so that beads are moved from left to right across the frame.

Example: Show various number combinations of 6.

Use each row of the abacus to demonstrate a number combination that equals 6. The first number in the equation is represented by a red, wavy bead(s) moved to the right side of the frame. The second number of the equation is represented by a yellow, smooth bead(s) moved to the right side of the frame.



1 + 5 = 6
2 + 4 = 6
3 + 3 = 6
4 + 2 = 6
5 + 1 = 6
6 + 0 = 6

SUBTRACTION

Use the **EZeeCOUNT Abacus** to perform subtraction tasks.

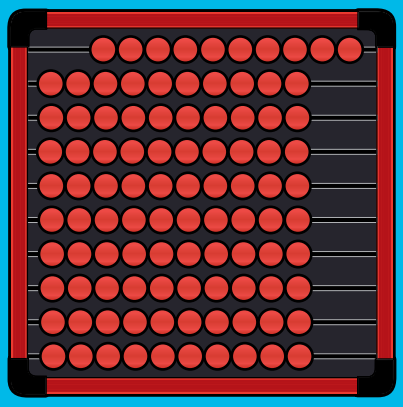
Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.
- Position the **EZeeCOUNT Abacus** in front of the student so that beads are moved from left to right across the frame.

Example 1: 10 – 5 = ?

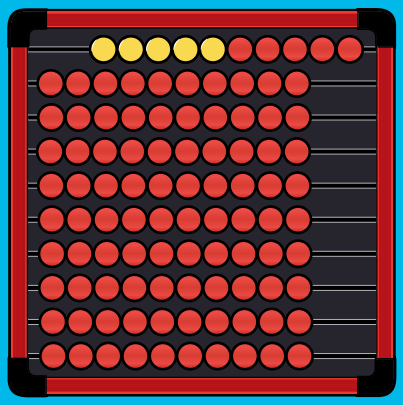
Step 1:

Slide 10 red wavy/rough beads in the top row to the right side of the frame.



Step 2:

From left to right, flip 5 of the beads in the first row to the yellow smooth side to represent the number subtracted from the total number of beads.



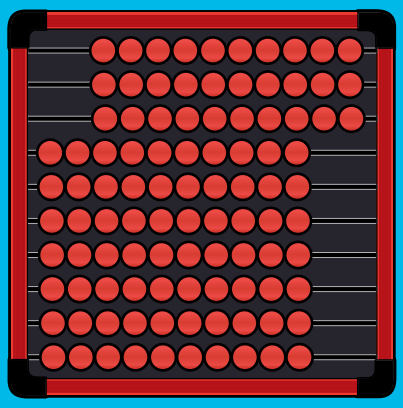
Step 3:

From left to right, count the remaining number of red wavy/rough beads to arrive at the answer **5**.

Example 2: 30 – 12 = ?

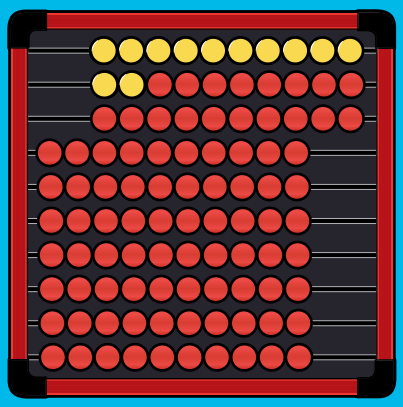
Step 1:

Slide 30 red wavy/rough beads to the right side of the frame—10 beads in the first row, 10 beads in the second row, and 10 beads in the third row.



Step 2:

From left to right, flip 10 beads in the first row and 2 beads in the second row to the yellow smooth side to represent the number subtracted from the total number of beads.



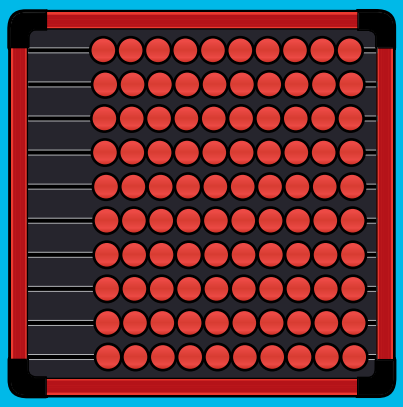
Step 3:

From left to right, count the remaining number of red wavy/rough beads in the second and third rows to arrive at the answer **18**.

Example 3: 100 – 31 = ?

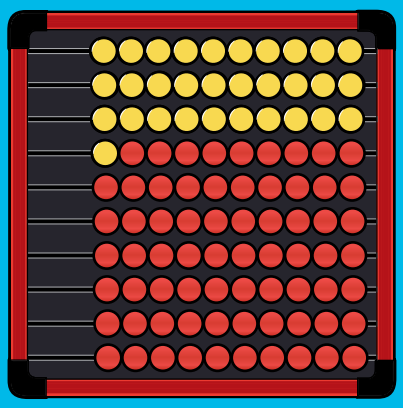
Step 1:

Slide all of the red wavy/rough beads to the right side of the frame to represent 100.



Step 2:

Beginning in the top row, flip 31 beads to the yellow smooth side. Move left to right along each row as beads are flipped. All of the beads in the top three rows, plus one bead in the fourth row, should be flipped.



Step 3:

Beginning in the fourth row, count the remaining number of red wavy/rough beads to arrive at the answer **69**. Encourage the student to count by 10's in rows with all beads flipped to the red wavy/rough side.

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MULTIPLICATION

Use the **EZeeCOUNT Abacus** to perform multiplication tasks.

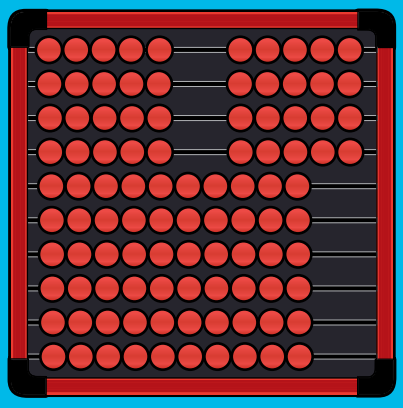
Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.
- Position the **EZeeCOUNT Abacus** in front of the student so that beads are moved from left to right across the frame.

Example 1: 4 x 5 = ?

Step 1:

Represent 4 groups of 5 units by sliding five beads in each of the first four rows to the right side of the frame.



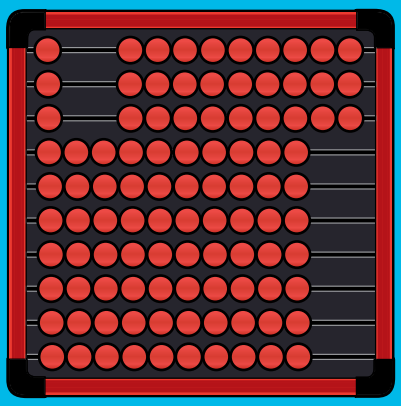
Step 2:

Count the total number of red wavy/ rough beads moved to the right side of the frame to arrive at the answer **20**.

Example 2: 3 x 9 = ?

Step 1:

Represent 3 groups of 9 units by sliding nine beads in the first three rows to the right side of the frame.



Step 2:

Count the total of red wavy/rough beads moved to the right side of the frame to arrive at the answer **27**.

EZeeCOUNT Abacus™

DIVISION

Use the **EZeeCOUNT Abacus** to perform division tasks.

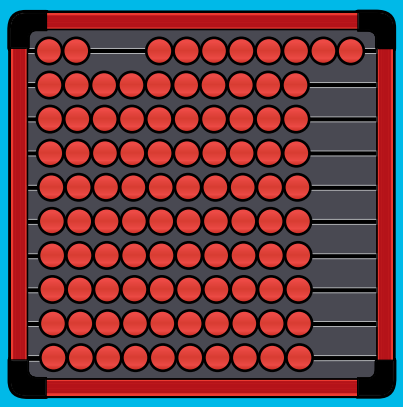
Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.
- Position the **EZeeCOUNT Abacus** in front of the student so that beads are moved from left to right across the frame.

Example 1: 8 ÷ 2 = ?

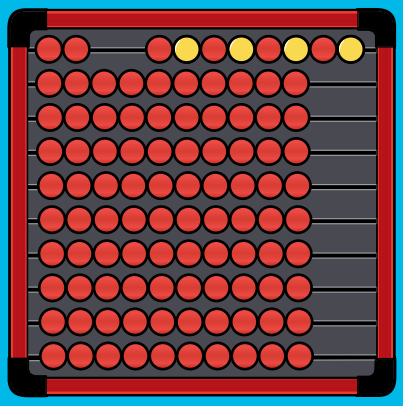
Step 1:

Slide 8 red wavy/rough beads in the top row to the right side of the frame.



Step 2:

To divide the 8 beads by 2, count from left to right "one, two," and flip every second bead to the yellow smooth side. Continue to count by two across the entire set of 8 beads.



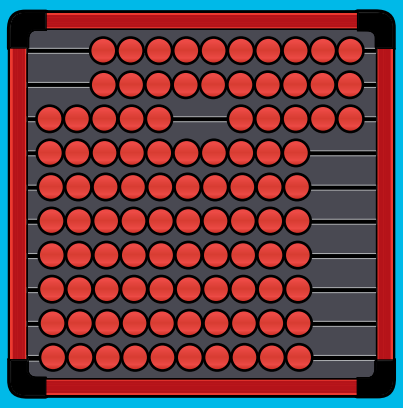
Step 3:

Count the number of yellow smooth beads to arrive at the answer **4**.

Example 2: 25 ÷ 3 = ?

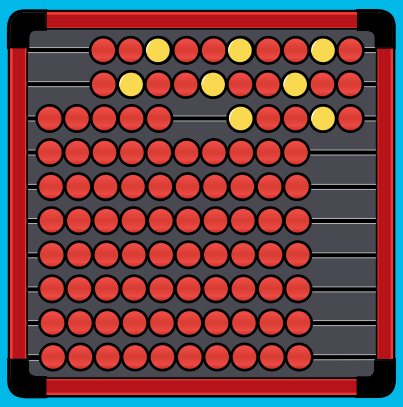
Step 1:

Slide 25 red wavy beads to the right side of the frame—10 in the first row, 10 in the second row, and 5 in the third row.



Step 2:

To divide the 25 beads by 3, count from left to right, "one, two, three," and flip every third bead to the yellow smooth side. Continue to count by three across the entire set of 25 beads until no longer possible.



Step 3:

Count the number of yellow smooth beads to arrive at the answer **8** with a **remainder of 1** (indicated by the right-most red wavy/rough bead in the third row).

FRACTIONS

Use the **EZeeCOUNT Abacus** to introduce and reinforce basic fraction concepts.

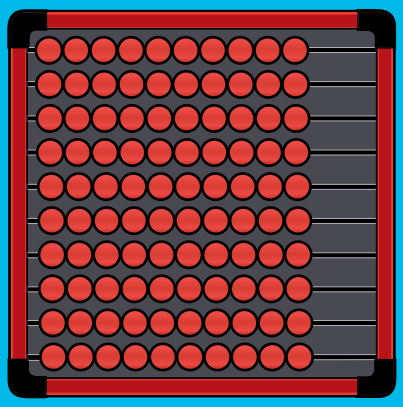
Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.

Example 1: Demonstrate the fraction 1/2.

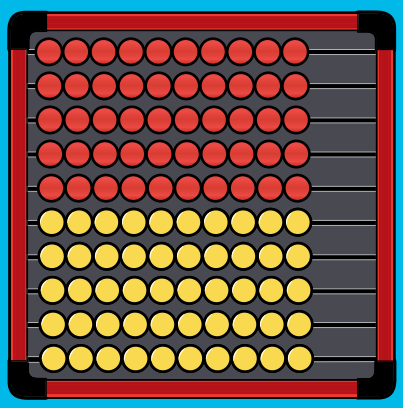
Step 1:

Begin with all of the beads flipped to the same color/texture—red wavy/rough side—to represent a **whole**.



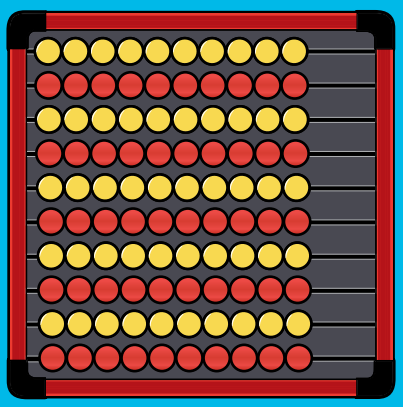
Step 2:

Flip 50 of the 100 beads to represent the fraction **1/2**. For example, flip all of the beads in the lower five rows to the yellow smooth side.



Step 3:

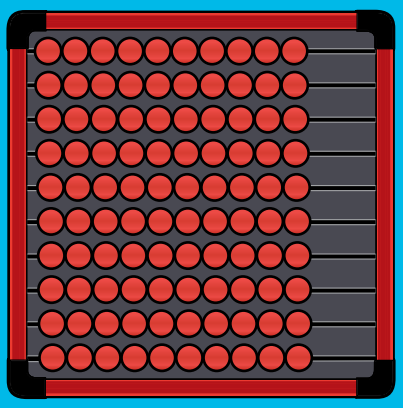
Continue to show other ways to represent the fraction **1/2**. For example, flip all of the beads in every other row to the yellow smooth side.



Example 2: Demonstrate the fraction 1/4.

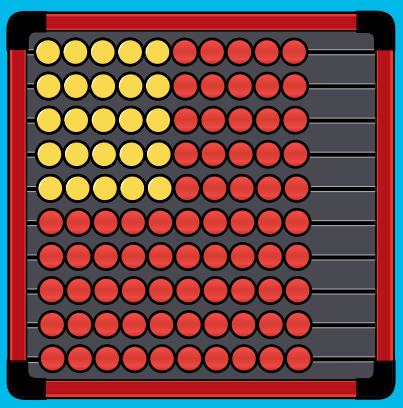
Step 1:

Begin with all of the beads flipped to the same color/texture—red wavy/ rough side—to represent a **whole**.



Step 2:

Flip 25 of the 100 beads to the yellow smooth side to represent the fraction **1/4**. For example, flip the first five beads in the first five rows to the yellow smooth side.



EZeeCOUNT Abacus™

PATTERNS

Use the **EZeeCOUNT Abacus** to describe and create a variety of texture, color, and number patterns.

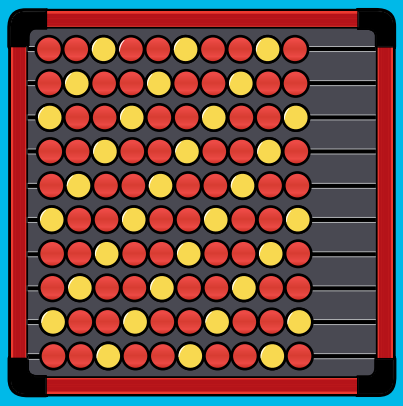
Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.

Example 1: Continue a texture or color pattern.

Step 1:

Starting with the top row and continuing through the last row, flip every third bead to the yellow smooth side. Move left to right along each row as beads are flipped.



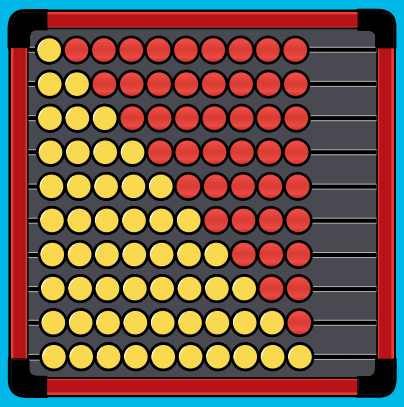
Step 2:

Ask the student to describe the resulting visual and/or tactile pattern.

Example 2: Demonstrate a pattern of ascending (or descending) number patterns.

Step 1:

Beginning with the first row, progressively flip beads to the yellow smooth side to demonstrate an increasing number pattern. Flip the first bead in the first row, the first two beads in the second row, the first three beads in the third row, and so on until all of the beads are flipped in the last (or tenth) row.



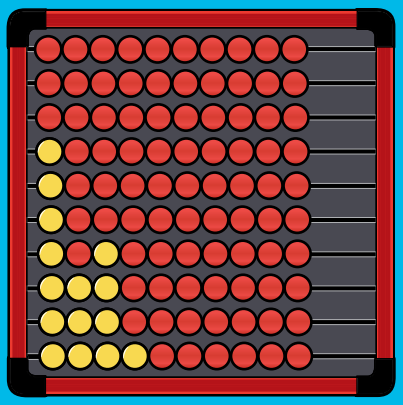
Step 2:

Ask the student to describe the resulting visual and/or tactile pattern.

EZeeCOUNT Abacus™

GRAPHS

Use the **EZeeCOUNT Abacus** as a tool to plot simple graphs. The X-axis is represented by the lower edge of the frame and Y-axis is represented by the left edge of the frame.



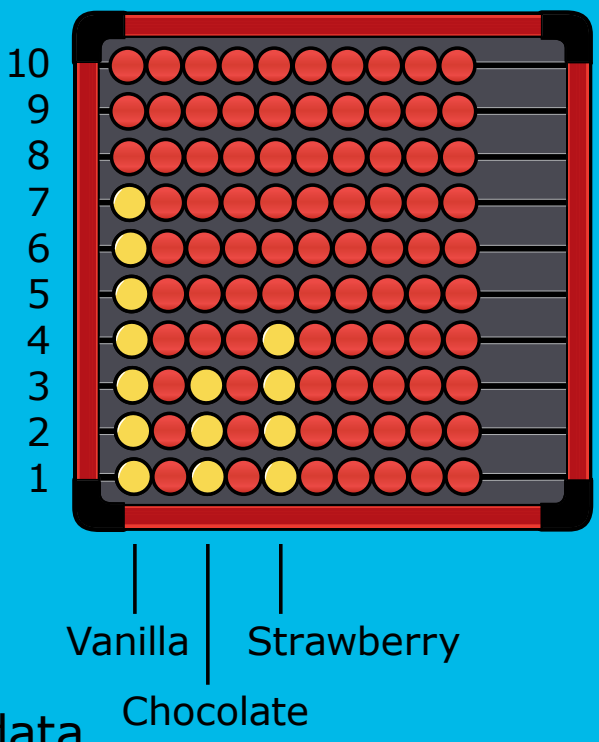
Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the red wavy/rough side.

Example: Record data from a survey of classmates' favorite ice cream flavor.

Step 1:

Position the abacus on top of a sheet of paper with pre-labeled (in print and/or braille) X- and Y-axis descriptors that align with the rows and columns of the abacus.



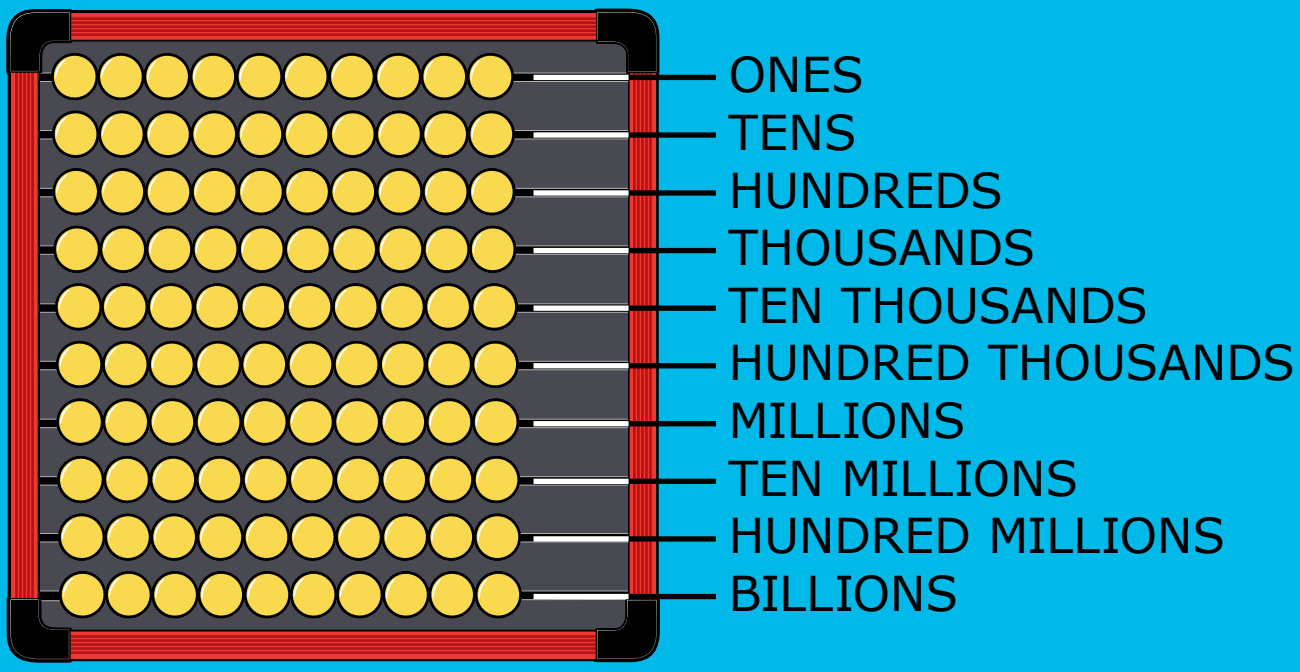
Step 2:

Flip the beads to the yellow smooth side in each labeled column to represent collected data.

EZeeCOUNT Abacus™

PLACE VALUE

Use the **EZeeCOUNT Abacus** to illustrate place value. To avoid confusion during transition to APH's **Expanded Beginner's Abacus** and/or **Cranmer Abacus**, both of which entail vertical bead movement, different bead arrangements/quantities, and unique regrouping rules, continue to orient the **EZeeCOUNT Abacus** so that the beads are moved left to right along the elastic bands.



Initial Setup:

- Slide all of the beads to the left side of the frame.
- Flip all of the beads to the yellow smooth side (to

differentiate from other activities described earlier in this Instruction Booklet).

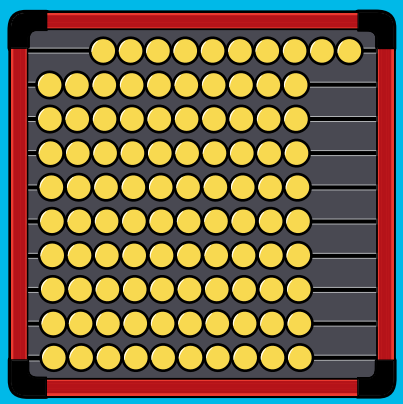
- Reinforce abacus terminology such as "setting" and "clearing" beads.
- Position the EZeeCOUNT Abacus in front of the student so that the beads are moved left to right across the frame as numbers are set.
- Move from the top (first) row to the bottom (tenth) row as increasing values are set—the first row represents ONES, the second row represents TENS, the third row represents HUNDREDS, and so on.

Example 1: Demonstrate regrouping when setting values on the EZeeCOUNT Abacus.

Rule of Regrouping: Whenever all of the beads within a row are moved or "set" to the right side of the frame, they are returned or "cleared" to the left side of the frame and replaced by one bead, moved to the right, in the next row.

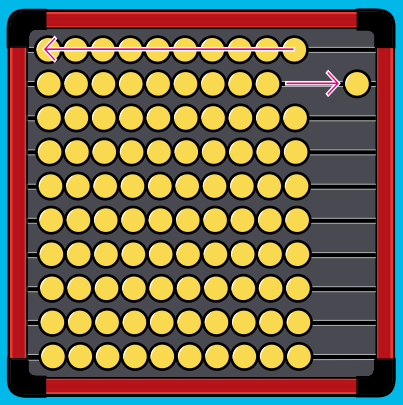
Step 1:

Slide all ten beads in the ONES row (top/first row) to the right side of the frame. Count as each bead is moved—**1**, **2**, **3**, etc.—until the value of **10** is reached.



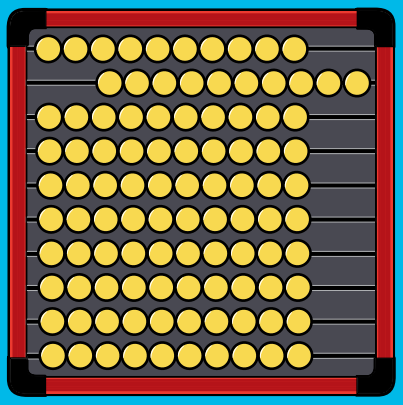
Step 2:

Regroup to the TENS row: Return or "clear" all of the beads in the ONES row (top row) to the left side of the frame and slide or "set" only one bead in the TENS row (second row) to the right side of the frame to represent the value of **10**.



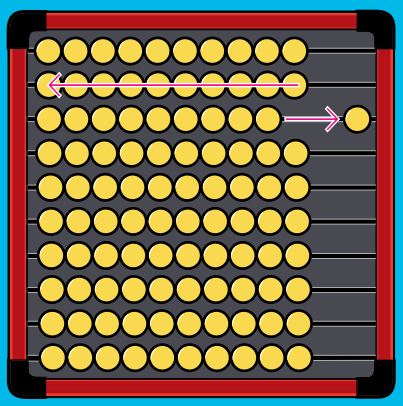
Step 3:

Continue to count as beads in the TENS row (second row) are moved to the right side of the frame—**20**, **30**, **40**, etc.—until the value of **100** is reached.



Step 4:

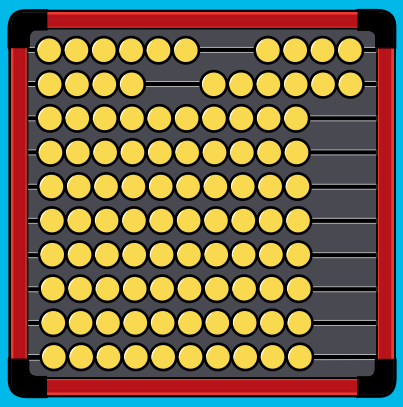
Regroup to the HUNDREDS row: Return or "clear" all of the beads in the TENS row (second row) to the right side of the frame and slide or "set" one bead in the HUNDREDS row (third row) to represent the value of **100**.



Step 5:

Continue the regrouping rule when setting values in rows representing THOUSANDS, TEN THOUSANDS, HUNDRED THOUSANDS, etc. The last (tenth) row represents BILLIONS.

Example 2: Set the value 64 on the EZeeCOUNT Abacus.



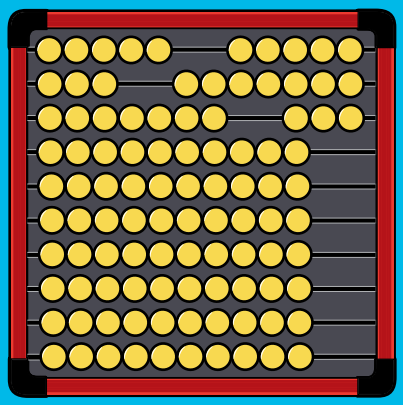
Step 1:

Slide four beads in the ONES row to the right side of the frame.

Step 2:

Slide six beads in the TENS row to the right side of the frame.

Example 3: Set the value 375 on the EZeeCOUNT Abacus.



Step 1:

Slide five beads in the ONES row to the right side of the frame.

Step 2:

Slide seven beads in the TENS row to the right side of the frame.

Step 3:

Slide three beads in the HUNDREDS row to the right side of the frame.

EZeeCOUNT Abacus™

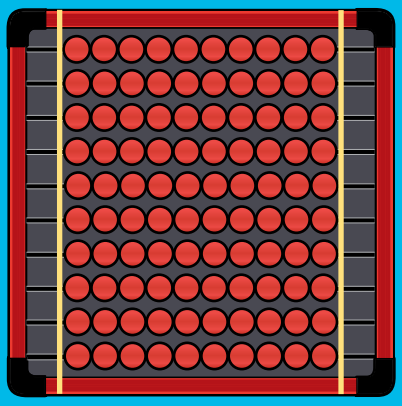
GAMES

Use the **EZeeCOUNT Abacus** to facilitate a variety of teacher- or student-created games that reinforce counting, spatial concepts, texture/color discrimination, and so forth.

Example: Not So Close!

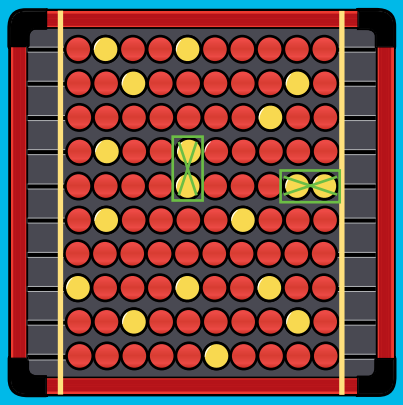
Number of Players: 2

Initial Setup:



- Flip all of the beads to the red wavy/rough side.
- To keep beads from moving side to side during game play, use two large rubber bands to create left and right boundaries or "bumpers" on the abacus. The rows of beads should be centered on the abacus.

Instructions:



Each player takes turns flipping any one bead within the 10 x 10 matrix to avoid ever having two yellow smooth beads adjacent to each other—side by side OR above and below. Diagonally positioned yellow smooth beads are allowed.

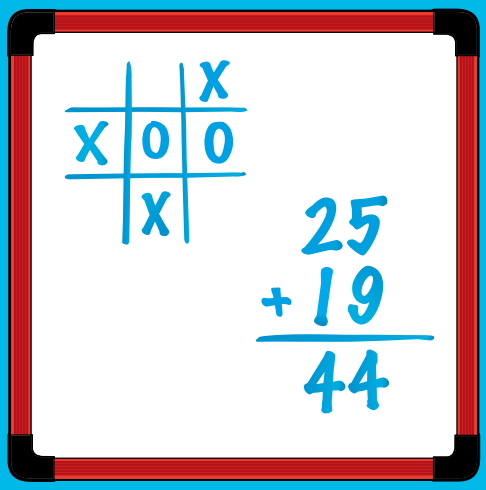
Winner:

The player who goes the longest without positioning two yellow smooth beads next to each other—horizontally or vertically—is the winner of the game.

EZeeCOUNT Abacus™

EXTRAS

The reverse side of the **EZeeCOUNT Abacus** has a dry-erasable surface that allows students with low vision to write math problems, draw pictures, play games (e.g., Tic-Tac-Toe), and so forth. Use this side of the abacus in combination with off-the-shelf dry-erase markers.



RESOURCES

APH offers a variety of abacus tools and related instruction guides.

Abacuses

Expanded Beginner's Abacus (1-03181-00)

Print Guidebook: (7-03181-00)

Braille Guidebook: (5-03181-00)

Large Abacus (1-03170-00)

Cranmer Abacus (1-03150-00)

Learning the Abacus

Abacus Basic Competency: A Counting Method

Large Print: 7-00219-00

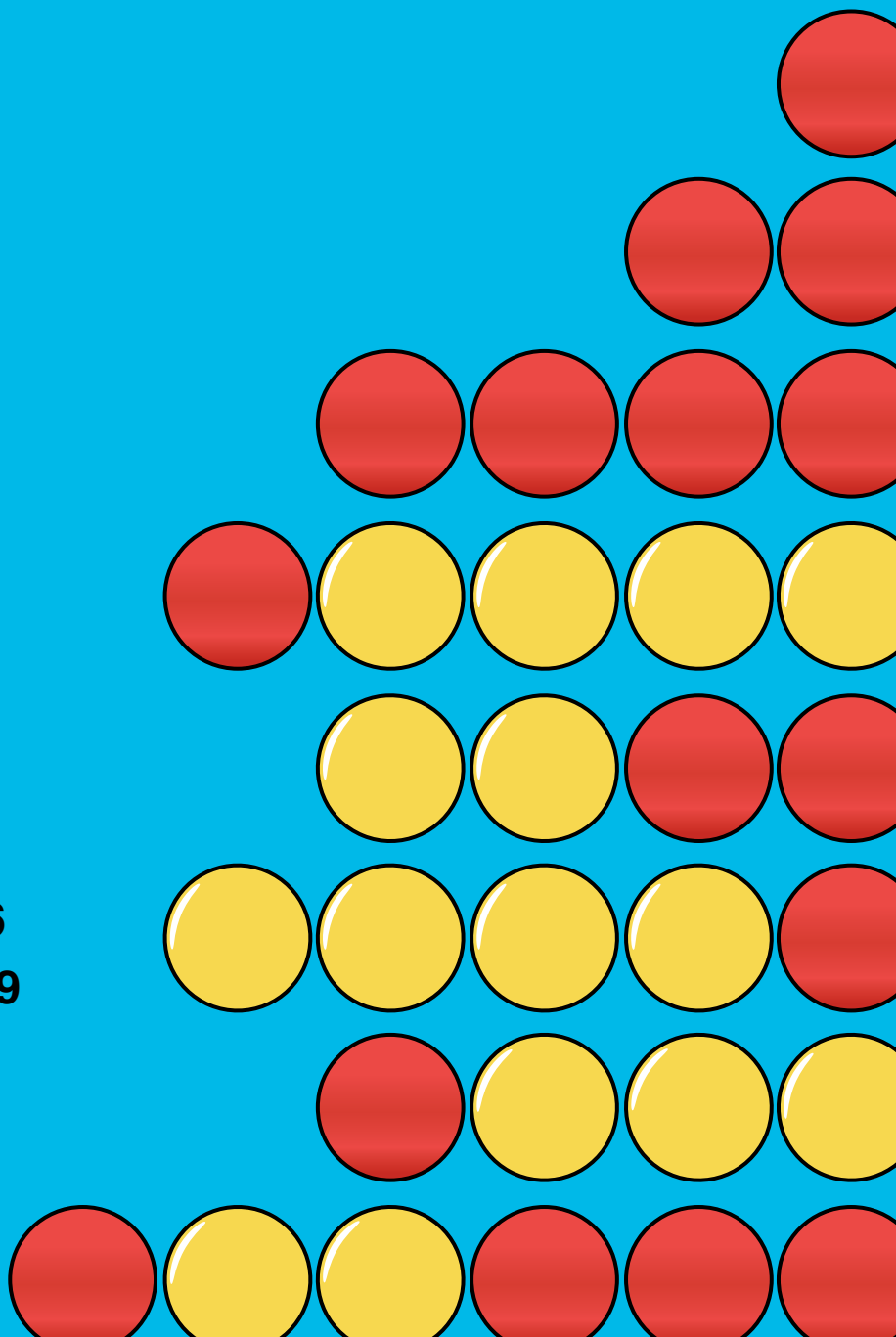
The Abacus: A Million Manipulatives in Your Pocket, **Online HIVE Course**

Abacus videos on APH's YouTube page

Visit www.aph.org for additional information regarding available math materials and curricula.

NOTES

NOTES



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