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## ▲ WHAT'S NEW WITH CLIPS? THERE'S AN APP FOR THAT! (THE REKENREK TOOL APP!)

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*Board, Agnes Grafton is from the Brant Haldimand Norfolk Catholic District School Board, and Ross Isenegger is from the Near North District School Board. Together they are currently on assignment with the Ontario Ministry of Education as Provincial Math Leads, working on the CLIPS project developing electronic supports.*

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*Kathleen Corrigan has recently retired from the Simcoe County District School Board and is currently keeping herself busy with numerous projects, including consulting with Agnes, Ross and Greg on resources for CLIPS and mathies.ca. She is also the*

*President-Elect for MAC2, and slated to be President in the 2014-2015 school year.*

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*Pat Margerm is an independent literacy and mathematics consultant with more than 30 years of K to 8 teaching experience with students, in-service and pre-service teachers. She is a long-time OAME board member and works in various aspects of mathematics education.*

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The CLIPS team continues to expand into new areas. Our first foray into the app world is a version of the

virtual Rekenrek tool, available on the App Store for iOS devices, and from Google Play for Android devices. The Rekenrek continues to be available from the Tool Container inside CLIPS ([www.MathCLIPS.ca](http://www.MathCLIPS.ca)) and from the Tools page of the [www.MATHIES.ca](http://www.MATHIES.ca) website, but now it is also available for mobile devices.

*(NOTE: At the time of writing this article, the app has been submitted to both the App Store and Google Play store. The team is hopeful that the approval process timeline is shorter than the publication timeline so that by the time you are reading this, it is indeed available as promised! If not, rest assured it is indeed coming soon!)*

### What is a Rekenrek?

A Rekenrek is a manipulative tool made of two rods of ten beads. Some Rekenreks have ten strings of beads. Each set of ten beads has five red beads and five white beads, thus encouraging students to work with anchors of five and ten. The student enters a number by sliding beads from the right to the left.



The virtual Rekenrek, available as an app or online, allows the student to determine the number of wires, as well as the colours of the beads and background. The virtual tool provides two shades that can be sized in various ways so the students can be challenged to consider number flexibly. Further, the app offers a writing tool that allows students to annotate their screen and communicate their thinking.



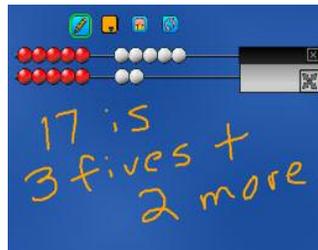
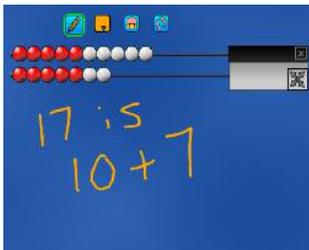
### What kind of math can be done with a Rekenrek?

The Rekenrek is a versatile tool that combines the attributes of several familiar math tools, such as ten frames, number lines, base-ten blocks, and counters.

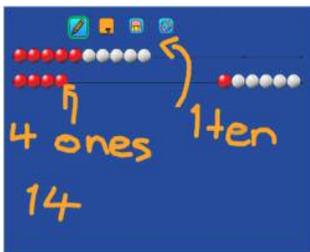
This tool is most commonly used in the primary grades; however, it can be used in junior grades and beyond.

Students are able to explore mathematical thinking, such as:

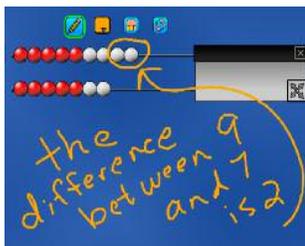
- subitizing (“instantly seeing how many”)
- counting principles, such as one-to-one correspondence, cardinality, and the “movement is magnitude” principle
- number relationships, using anchors of 5 and 10
- understanding addition and subtraction in terms of joining and taking away
- understanding addition and subtraction in terms of missing addends
- order of operations
- decimals
- composing and decomposing numbers



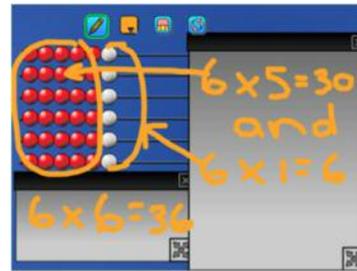
- understanding place value



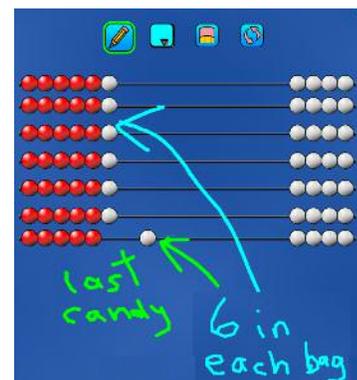
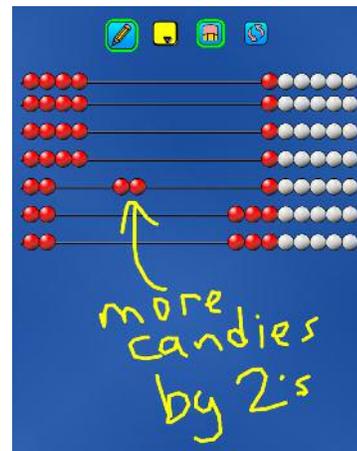
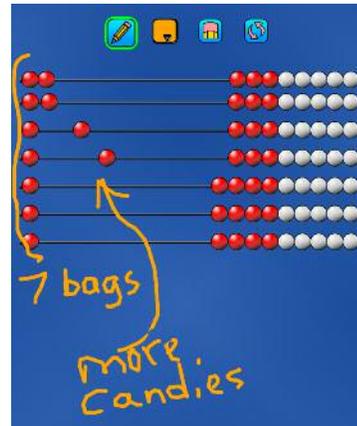
- understanding subtraction in terms of differences or comparisons



- developing multiplicative thinking



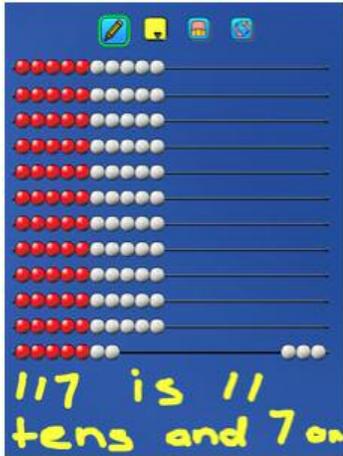
- visualizing division facts (e.g., of partitive division)  
Example: I have 42 candies for the loot bags. I have 7 friends. How many candies do I put into each bag?



- etc.

Students are also encouraged to think quantitatively (and more and more abstractly), model mathematics, and look for patterns and structures.

- Make 117.



- Make 48, using the fewest possible pushes.



- Game idea:
  - Students turn over a number card (e.g., 6).
  - First player uses the top wire to make part of 6.
  - Partner has to finish making 6.



## How could a teacher use a Rekenrek with students?

Rekenreks are flexible tools that can be used in a variety of ways.

Initially, students should freely explore the Rekenrek and share what they try and the math that they notice. The teacher can record students' ideas about the tool, using math notation and vocabulary. Later, exploring number within a three-part math lesson format will soon result in students who confidently use the Rekenrek to solve problems and communicate their thinking.

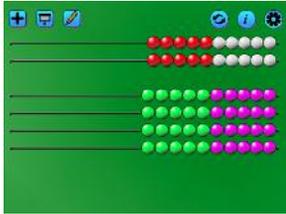
A few tips:

- Initially, encourage the students to explore for themselves. Later you can use a large Rekenrek, or project the virtual Rekenrek, so students and adults can share ideas with the whole class.
- Encourage multiple ways to demonstrate the same concept or quantities.
- Use shades (on the app, or made of cardboard) to widen the possible uses of the Rekenrek.
- Encourage students to articulate their thinking as they manipulate the beads.
- Connect Rekenrek representations of operations and number with other manipulatives, as well as traditional notations.
- Link the math actions with stories that can illuminate the ideas in other contexts.
- Encourage students to consider the Rekenrek as a tool when they are determining the best tool for a situation.
- Model thinking and language to support metacognition, so students begin to recognize the visual models they are making in order to discover number relationships and develop computational skills.

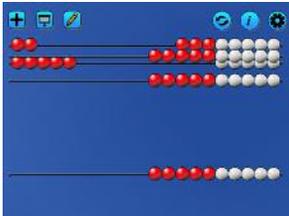
## What features does the virtual Rekenrek app have?

The virtual Rekenrek provides many features to enhance students' use of the tool.

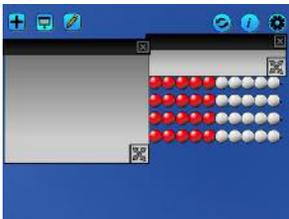
Colour and wire spacing can be adjusted to better meet the visual and fine-motor needs of students.



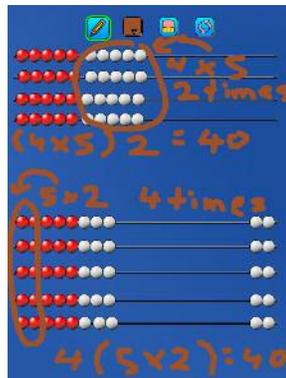
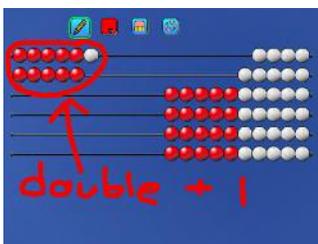
Wires can be overlapped to highlight relationships between numbers.



Shades can be used to highlight or conceal area to help build flexible thinking.



Annotations can be used to communicate student thinking.



Check out the wiki support page for the CLIPS Rekenrek tool at <http://mathclips.wikispaces.com/RekenrekTool> for further help and links to how-to videos.

Stay tuned for more tools and games available on **MathCLIPS.ca** and **mathies.ca**, and available for your mobile device in the App Store or Google Play. ▲