Number Sense At Your Fingertips

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Why Use TouchCounts?

It motivates students to overcome challenges in Mathematics.[1]

It fosters an embodied understanding of Mathematics. [2]

It combines social [2] and technological[3] learning in the classroom and beyond.

What Is TouchCounts?

TouchCounts is an app through which users can use their fingers to learn to count, add, subtract and partition. Developed by Nathalie Sinclair and Nicholas Jackiw, TouchCounts was created as a part of the Tangible Mathematics Project at Simon Fraser University in BC. Presenting a truly hands-on experience to learning, TouchCounts helps to develop users' **number sense, ordinality, cardinality** and **basic operations**. TouchCounts offers two worlds, the Numbers World and the Operations World, which are designed to focus on different areas of users' mathematical development. TouchCounts allows for independent exploration of mathematics through the use of gestures and touch.

Who Should Use TouchCounts?

Teachers, parents, and students can use TouchCounts. TouchCounts can be most effectively used in early years math as it improves children's number sense. More specifically, it promotes students' understanding of **ordinality, cardinality**, and **operations**. By introducing TouchCounts early on, students can better understand numbers, increasing their chances for future math success. It can enhance mathematical learning through autonomous and teacher-led instruction, which makes it a versatile tool in and out of the classroom..

Using TouchCounts In A Classroom

The use of TouchCounts in the classroom increases students' engagement, promotes meaningful student-driven learning experiences, and motivates students to participate in "hard fun".[1] It creates collaborative experiences that are driven from students' curiosities and choice. Using TouchCounts for mathematics education is an excellent way to support growth mindset and for all students to access learning.

What Mathematical Concepts Does TouchCounts Target?

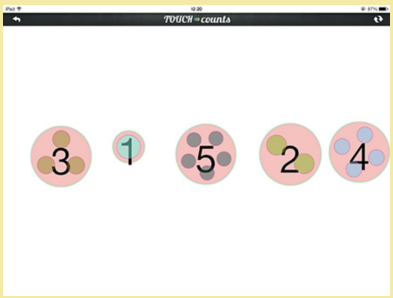
Numbers World:

- ordinality
- cardinality
- enumeration
- one-to-one correspondence
- quantity and number magnitude

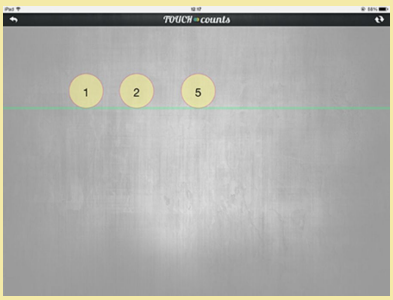
Operations World:

- addition
- subtraction
- partitioning
- distribution

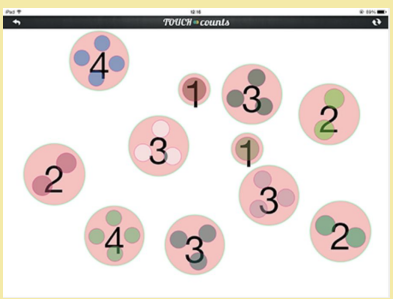
Examples:



Teacher makes 1, 2, 3, 4 and 5 placed randomly on the screen and asks: can you place these in order?



Teacher places 1, 2 and 5 above the shelf but lets 3 and 4 fall. What are the missing numbers? Try the same thing with different numbers.



Teacher makes several 1s, 2s, 3s and 4s and challenges children to use these numbers to make 5s (or any other target number)

("TouchCounts", 2019)

Where did the idea for TouchCounts come from?

Almost 20 years ago, TouchCounts developer, Nathalie Sinclair, lost her ability to read, count and recall letters and numbers following a surgery to remove a tumour from her brain. Determined to relearn these important concepts, Nathalie recognized that her understanding improved when using her fingers to trace letters and numbers. This experience combined with the ever-growing popularity of technology and her husband's expertise in the area, led to the creation of TouchCounts.

("Research focus TouchCounts", 2015)

Late-Primary or Junior Grades?

Check out TouchTimes!

References:

[1]Kafai, Y. B. (2018). Constructionist visions: Hard fun with serious games. *International Journal of Child-Computer Interaction*.

[2]Sinclair, N., Chorney, S., & Rodney, S. (2015). Rhythm in number: Exploring the affective, social, and mathematical dimensions using TouchCounts. *Mathematics Education Research Journal, 28*(1).

[3]Sinclair, N. & Heyd-Metzuyanim, E. (2014). Learning number with TouchCounts: The role of emotions and the body in mathematical communication. *Technology, Knowledge and Learning*, *19*(1), 81-99. doi: 10.1007/s10758-014-9212-x

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