

# What is a Ten Frame and why is it a useful tool for developing early number relationships and fact fluency<sup>1</sup>?



A ten frame is a simple graphic tool that allows people to “see” numbers. Understanding that numbers are composed of tens and ones is an important foundational concept, setting the stage for work with larger numbers. A strong sense of “ten” is a prerequisite for place-value understanding and mental calculations. This You Tube Video introduces the ten frame and explains how this tool is useful for students just beginning to learn about numbers:

<http://www.youtube.com/watch?v=p6RaMGDPfjg&NR=1>

## BUT HOW TO DEVELOP THIS IDEA?

Arranging counters in different ways on the ten-frame prompts students to form mental images of the numbers represented. As NCTM<sup>2</sup> points out, “the ten-frame uses the concept of benchmark numbers (5 and 10) and helps students develop visual images for each number.”

Using a ten-frame, students can easily see that 6 is 1 more than 5 and 4 less than 10, or that 8 can be seen as “5 and 3 more” and as “2 away from 10.” Pause and look at the 10 frame. Can you ‘see’ these number facts?

Once students are able to visualise the numbers 1 through 10, they begin to develop mental strategies for manipulating those numbers, all within the context of the numbers' relationship to ten.

Researcher John Van de Walle recommends that children in kindergarten and early first grade explore numbers with a five-frame for a week or so before moving on to a ten-frame. Introduce the ten-frame with the following rule, says Van de Walle:

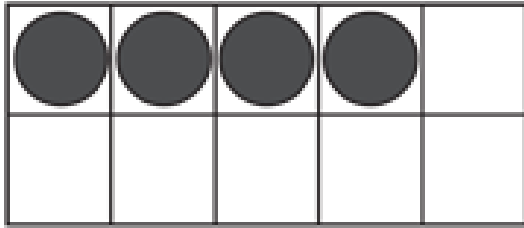
*Always fill the top row first, starting on the left, the same way you read. When the top row is full, counters can be placed on the bottom row, also from the left. This will produce the “standard way” to show numbers on the ten-frame. (p. 122)*

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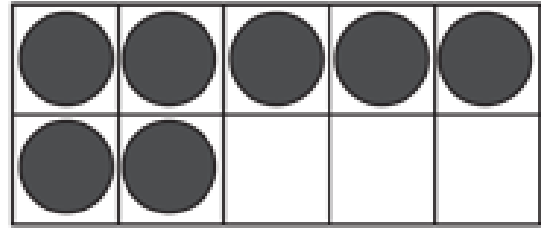
<sup>1</sup> Adapted from <http://www.region10ct.org/math/region10mathsitefaq/What%20is%20a%20Ten%20Frame.pdf>

<sup>2</sup> National Council of Teachers of Mathematics <http://www.nctm.org/>





standard 4 on the ten-frame



standard 7 on the ten-frame

There is a danger in asking children to work with numbers beyond 10 before they have learned the composition and decomposition of numbers to 10. As Richardson has observed, "when children are given practice adding and subtracting numbers to 20 before they know the parts of numbers to 10, many develop fast counting for getting answers instead of learning the basic relationships. Since they are successful at getting answers quickly, their teachers may not be aware that they are, in fact, counting to get those answers. Counting back or counting up does not help children know the answer the next time they confront the same problem." (p. 27)

In summary, all evidence points to a solid grounding in the relationships among the numbers 1 through 10 before place-value concepts can even begin to be developed. If you want your students to really know their number facts and not just become "better counters," have them work with the ten-frame.

## OTHER TEN FRAME ACTIVITIES TAKEN FROM VAN DE WALLE

### Ten-Frame Flash

Flash ten-frame cards to the class or group, and see how fast the children can tell how many dots are shown. This activity is fast-paced, takes only a few minutes, can be done at any time, and is a lot of fun if you encourage speed. (p. 123)

### This is a link to a Computer Based Interactive Ten Frame

This is really four activities in one - use the links to the left to choose the different activities:  
<http://illuminations.nctm.org/activitydetail.aspx?id=75>

## SOURCES

Richardson, K. (2003). *Assessing Math Concepts: Ten Frames*. Rowley, MA: Didax.

Van de Walle, J.A. (2003). *Elementary & Middle School Mathematics*. Boston, MA: Pearson.

