

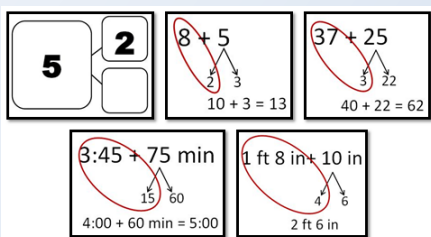
# Math Empowers

## Composing & Decomposing Numbers

"If basic facts are to be foundational, they must be based on an understanding of the composition and decomposition of numbers"

-Kathy Richardson

Considering values in terms of parts and wholes is a critical part of developing number sense and fluency. Consider the following examples showing how the ability to fluently decompose and compose numbers allows for *flexible* computation... not only with basic facts, but soon with multi-digit computation, fractions and measurement concepts.



Many students enter first grade flexibly composing and decomposing most numbers to 10, yet many do not. Children often develop automaticity with 3, 4, 5 and then 10 before knowing all the ways of making 6, 7 and 8. A [hiding assessment](#) can identify exactly what numbers a child can quickly and confidently recognize in terms of wholes and parts. When a student needs to count or use fingers to determine a missing part, that is their number.

There are a variety of activities first graders can work with such as [Rekenreks](#), [number bracelets](#), [dot cards](#), and [shake and spill \(On & Off\)](#) games to differentiate composing and decomposing practice. Attached are some "Shake and Spill" activities, which are easily differentiated by giving each child "their" number of counters. Some could be working with 6 counters, others 9, and perhaps a few have 15 counters to shake and spill onto their picture and quickly identify *how many are on* and *how many are off* the picture. **First graders should be working with "their" target number consistently to develop number sense.**

\*Click here for a [hiding assessment](#) video!

## SUB-I-WHAT-ING?

"Subitizing is a fundamental skill in the development of students' understanding of number. Students can use pattern recognition to discover essential properties of number, such as conservation and compensation. They can develop such capabilities as **unitizing, counting on, and composing and decomposing numbers**, as well as their understanding of arithmetic and place value-**all valuable components of number sense.**" Teaching Children Mathematics, March 1999



Attached are some higher level subitizing quick images that allow students to develop their mental estimation skills and improve number sense.

## Differentiated Fluency Practice

**GIVE A DOG A BONE:** Find a dog bone on an empty hundreds chart! **ESSENTIAL FLUENCY CENTER** for first graders! Try it today on chrome books or desktops!



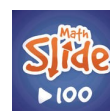
### iPad Apps



**SUBITIZE TREE** lets you choose a speed, level, and card type (ten frames, dice, cards, etc...) Players must "save the animals" by quickly identifying an amount visually before the doors close.

Set all the animals free and win the game!

**MATH SLIDE** is another multiplayer game helping children understand place value. Great visuals of tens and ones and the competition gives kiddoes a reason to focus on the amounts.



**MATH DUEL** is a split screen mathematics game that allows **two players** to verse each other **on the same device!** **ADJUST SETTINGS** for each player to level the playing field.