Getting the Most out of Number Talks

Widely recognized as a critical component of every math classroom, Number Talks support development of fluency and dialog. Starting with a number talk ensures that you have incorporated **mathematical processes** that are so critical to "doing" mathematics: **Reasoning**, **representing**, **visualizing**, **communicating**, making **connections** and practicing **mental math and estimation**.

Graham Fletcher uses a system of extending number talks in his room, by having students keep a "Number Talks" journal. After the full group number talks, students pick up their journal and find two handwritten questions just for them (differentiated to be "just right"). Students solve, sketch and describe their strategies. Talk about a way to get our kids explaining, justifying their answers, and practicing flexible reasoning. Read more here https://www.beyondthealgorithm.ca/tweaking-number-talks/

One thing I'm asked about a lot is helping kids "name the strategies". There are some variations, but I'll include a few examples. Note that there is a difference between a "strategy" and a "model". A strategy is something like breaking a number up or decomposing, but an open number line is a model.
Here's a chart from Sherry Parrish (compiled by Sara Van Der Werf , Minneapolis.

Number Talks - Common Strategies Students Should Know

ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION
Strategies • Making Tens • Making Landmark or Friendly Numbers • Doubles/Near Doubles • Breaking Numbers into Place value • Compensation • Adding in Chunks	**Strategies** • Adding Up • Removal or Counting Back • Place Value & Negative Numbers • Adjusting One Number to Create another Problem • Keeping a Constant Difference.	**Strategies** • Repeated Addition or Skip Counting • Making Landmark or Friendly Numbers • Partial Products • Doubling or Halving • Breaking Factors into Smaller Factors	**Strategies** • Repeated Subtraction/Dealing Out • Partial Quotients • Proportional Reasoning
Models • Open Number Line • Part/Whole Box • Real Life Contexts	**Models** • Open Number Line • Part/Whole Box • Real Life Contexts	**Models** • Arrays • Open Array • Real Life Contexts	**Models** • Arrays • Open Array • Real Life Contexts

The strategies above are explained in Number Talks: helping Children Build Mental Math & Computational Strategies by Sherry Parrish
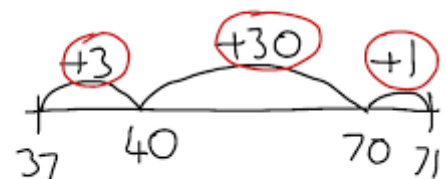
We might use an open number line for addition or subtraction (Kids might say "add up in chunks")

Decomposing numbers means taking them apart.
Ex:

$241 + 138$

$200 + 100$
$= 300$

$40 + 30$
$= 70$

$1 + 8 = 9$

$= 379$

$71 - 37 = 34$

$+3 \quad +30 \quad +1$

37   40   70   71

← "splitting by place value"

We can decompose numbers to use "partial product"

Ex:

$$24 \times 8$$

$$20 \quad 4$$

$$(20 \times 8) + (4 \times 8)$$

$$160 + 32 = 192$$

Putting it back together is "composing"

Kids could say "partial product" or "decomposing"

Composing and Decomposing numbers is one of the big ideas of our curriculum. It is part of many types of math including basic operation, estimation, algorithms like regrouping and long division, exponents, etc.

Algorithm: "A set of steps that are followed in order to solve a mathematical problem or to complete a computer process".(-Merriam Webster) So when kids say "I stacked them" etc, that is an "algorithm".
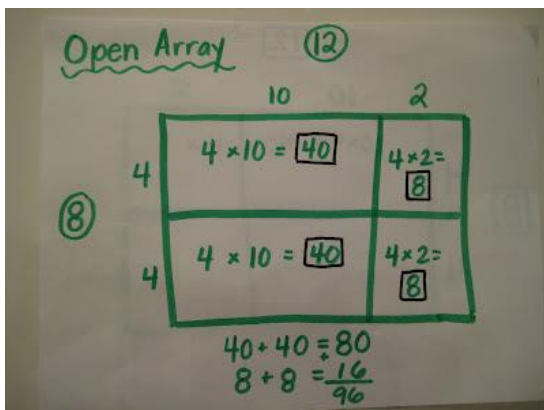
Ex: 872 X 14

$$\begin{array}{r} 872 \\ \times\ 14 \\ \hline \end{array} \Big\} \text{algorithm}$$
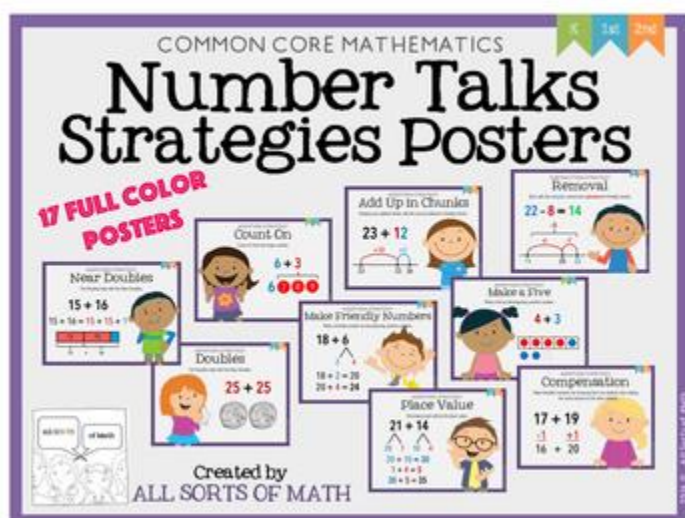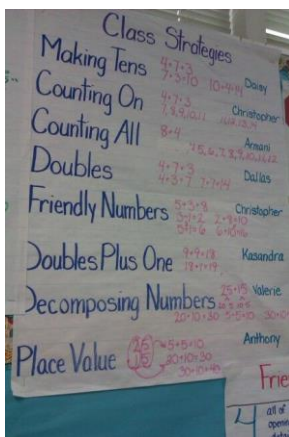
460 ÷ 14

$$14\overline{)460} \Big\} \text{algorithm}$$

"Open Array" is also called "box multiplication"

Some teachers post student strategies

Read more here https://elemath.hallco.org/web/number-talks/