Understanding Your Child's Mathematics

Building Number Sense Skills & Fluency

Project for Elementary Mathematics
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"Get to a Number"

Remember at the beginning of these conversations about how **place value** is so foundational to everything your son or daughter needs to build his or her number sense on? If your child, as well as yourself, have begun to consistently call numbers by its value rather than just by its digit name, building this skill of "getting to a number" in ever more efficient chunks is easier. If all numbers are strings of single digits, this is hard. Children who struggle to do this next series of activities usually have weaker place value knowledge.

Tools: • A deck of cards with the picture cards set aside; • A cut up "hundreds chart" (This gives you a deck of cards with the numbers 1-100)

Working Up

Get to 10 (Or the next 10): Using a deck of cards, turn over a card and ask, *"How much to get to 10?"* Extension: Do the same thing and ask, *"How much to get to 20?"* Now take the cut up 100 chart cards, turn one card over and ask, *"How much to get to the next ten?* Extension: Do the same thing, say 46 is drawn, and ask, *"How much to get to 60?"* meaning two tens above the number.

Get to 100, The Next 100, The Next 1000: Using the cut up hundreds chart deck of numbers, flip one card over at a time and ask, *"How much to get to 100?"* **Early learners** will need a way to visually see the numbers. Use the following arrow notation to help: Example: 67, How much to get to 100? 67 + <u>3</u> → 70 + <u>30</u> → 100, the answer is 33. Early attempts by children typically require going up only one ten at a time (<u>70</u>, 80, 90, 100). As a child's number sense grows, the ability to work in larger and larger chunks gets easier. Some numbers need to be jotted down on paper, other parts are done in the head.

Getting from A to B: Draw two number cards from the 100-deck (say 23 and 56) and ask, *"How much to get from 23 to 56?"* With arrow notation, and at its most mature stage, might look like this: 23 + <u>7</u> → 30 + <u>26</u> → 56, 26 + 4 + 3 = 33 The answer is 33. A child could also do the following: 23 + <u>30</u> → 53 + <u>3</u> → 56, The answer is 33. This is one of those Minneapolis, St. Paul things. Both work. It's a matter of preference and judgment. Getting fluent at this stage turns any subtraction problem into a quick Adding Up problem.

Working Backwards

Go Back from a Decade: Pull out the decade cards from the 100-card deck (10, 20, 30...) and place them in a deck of their own. Draw a card from the deck of regular playing cards. Say, *"Go back..."* Example: Draw 70. Draw 4, say, *"Go back 4."* This is an alternative reinforcement of facts to 10 but from a subtractive point of view.

Go Back from a Number: Draw a card from the 100-card deck and say, *"Go back..."* Example: Draw 82. Draw 6. Say, *"Go back 6."* The goal is to have the child think about how to break the 6 apart quickly, particularly by

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getting to the nearest ten and then, using their ten facts, go back into the decade below. *"Go back 2, back 4."* 82 - 2 → 80 - 4 → 76.

Go Back from 100: Draw a card from the 100-card deck and say, *Go back...* Example: Draw 47. Say, *Go back 47 from 100.* 100 - 40 → 60 - 7 → 53. It is acceptable for the student to change this into an addition problem. However, it is worthwhile to develop the skill backwards in chunks.

Get From B to A: Draw two cards from the 100-card deck and say, *"Go back from... to..."* Example: Draw 58 and 35. Say, "*Get from 58 to 35."* There are two subtractive approaches to this game. The Difference Between strategy, as the game is set up to be, would look as follows: 58 - $\underline{8}$ → 50 - $\underline{15}$ → 35; 15 + 8 = 23; the answer is 23. A Take Away strategy can also be used: 58 - 30 → 28 - 5 → 23; the answer is 23. While the game is set up to work backwards from one number to the next, if a child quickly turns the numbers around and add up, let them. It is a mathematically sound strategy and represents a flexibility that should not be discouraged: 35 + $\underline{5}$ → 40 + $\underline{18}$ → 58; 18 + 5 = 23; The answer is 23.

Arrow Notation & The Equal Sign

Notice that I have been using arrows in the notation system to represent steps taken to solve a problem. Many children, and even some adults, like to show their actions in a continuous flow. Let's take one of the examples above: *'Get from 35 to 58.'* Some might write their steps this way:

$$35 + \underline{5} = 40 + \underline{18} = 58;\ 18 + 5 = 23; \text{ the answer is } 23$$

This is not a mathematical correct use of the equal sign. The equal sign is a relational symbol. All the values on one side of the equal sign need to be worth the same as the values on the other side. So while 35 = 5 does equal 40, 35 + 5 *does not equal* 40 + 18. It is important for even young children to make this distinction.

Equality chains can and do exist. Example: 18 + 5 = 18 + 2 + 3 = 20 + 3 = 23. It is perfectly legitimate to use the equal sing in this manner. Notice, however, that each set of values, across all combinations across the chain, combines to make the same value. 'Equals' *does not mean 'the answer!'* "Equals means the values are worth the same.

The arrow notation allows your child to use an 'open number line' image to help organize his or her thinking. The values added or subtracted, can be underlined as above to help distinguish which values one needs to combine afterwards. But those values can also appear *above the arrow* to make them more distinguishable. Example:

$$35 \xrightarrow{+5} 40 \xrightarrow{+10} 50 \xrightarrow{+8} 58;\ 5 + 10 + 8 = 23$$

The arrows can also be used in reverse fashion to help accentuate movement towards zero on the number line.

$$35 \xleftarrow{-5} 40 \xleftarrow{-10} 50 \xleftarrow{-8} 58$$

The arrow notation is merely a way to capture ones actions without compromising the use of the "=" sign. That's all. It holds no more significance than that.

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