stage 3:
addition & subtraction to 5

Big Idea: Parts to Whole

Parts-to-Whole is the big idea that underlies addition and subtraction. The central concept is that there is a whole that can be partitioned into a certain number of parts. If we combine the parts, they equal the whole. If the whole is 8, the parts could be 6 and 2. Combine the two parts (6 + 2), they equal the whole (8). We can change the order of the parts (2 + 6) and they still equal the whole. We can also find several different ways of making a whole (8) out of two parts, such as 7 + 1 or 3 + 5, or three parts, such as 4 + 3 + 1.

A part can be taken away from the whole leaving another part left over. The whole is 8, we take away 5, 3 is left over. A student that has developed in-depth understanding of the Parts-to-Whole big idea can see addition and subtraction as different ways of forming number relationships, often called “fact families,” or, related facts.

Why is Parts to Whole Important?

Understanding how numbers are related to each other signals that children are ready to experience that each number is more than a distinct character; larger numbers, or wholes, are made up of smaller numbers, or parts. When the student sees the iconic 5 dots on a number card, combined with an additional 2 dots, she can count or add on and know there are 7 dots in total. The 5-length bar with a 2-length bar added on takes on the length that is the same as the 7-bar. Two jumps on the number line past the 5 mark, is the same as 2 numbers past 5, which in turn shows that 7 is two more than 5. Children begin by changing a small collection of dots, or bars, or number line jumps, to a larger amount by virtue of more dots, longer bars, or end points farther along the number line.

Stage 3 Learning Progression

Concept	Standard	Example	Description
3.1: Addition: Missing Result to 5	K.OA.1	1 + 2 = ?	3.1 introduces Parts-to-Whole first using visual tools, and then by bridging to symbols. Equations appear for the first time in the program, as well as an extension of the equal sign, first seen in Stage 2.5. Number equations show the meaning of the + symbol, and how the = symbol is used in mathematics. The placement of the = symbol is both at the beginning and the “end” of so that students become familiar and flexible with both appearances while combining parts to make a new whole.The missing result comes after combining parts, or appears before parts are combined. Two sides of an equation are equal when the = sign is used.
3.2: Addition: Missing Change to 5	K.OA.2	1 + ? = 3	Still keeping the numbers small, students are given the whole, and need to find what parts combine with another to make that whole. In 3.2, they see how numbers can be broken apart in a variety of ways. They encounter the idea that order doesn’t matter. And they that the quantity remains the same even when parts are broken up differently. Students encounter the same progression of environments offered in 3.1 with the results being reinforcement of part-part-whole and more fluency with the pairings to 5.

Concept	Standard	Example	Description
3.3: Subtraction: Missing Result to 5	K.OA.2	3 - 2 = ?	After working on missing parts in 3.2, subtraction is introduced in 3.3. Consider 5 - 2. The iconic 5-dotted number card is presented, and then 2 dots are taken away, how many would be left over from the original quantity of 5? A 5-length bar is presented; determine which bar would be left over if a 2-length bar were taken away from that 5-length bar.
3.4: Subtraction: Missing Change to 5	K.OA.3	3 - ? = 1	The student who understands Parts-to-Whole approaches this problem in a different way. With 2 + 3, the student can mentally picture 2 combined with 3 as being equal to 5. When considering the result of 5 - 2, she knows that since 2 + 3 = 5, 5 - 2 equals 3. She can identify missing parts by using related combinations.
3.5: Adding 0 and 1	1.OA.5	7 + 0 = ?	In Stage 1.5, students experienced '1 more' and in 3.5, they are asked to return to this concept, and extend it to 'adding 1', or, '+ 1.' Students are also increasing their number values to 9, as well as considering the role of zero. As in 1.5, adding 0 and 1 aim to be automatic-found without counting-and further reinforcements of the size of things and interconnectedness of numbers in our number system.
3.6: Subtracting 0 and 1	1.OA.5	7 - 1 = ?	As in 3.5, without counting.
3.7: Addition - Commutative Property	K.OA.2	5 + 2 = 2 + ?	Taking the next step from SubLevels 3.4 and 3.5, students now work with combinations 0-9. Experiences with partitioning in 3.2 lead them to experience that addition is commutative.

Using the Extra Practice Worksheets

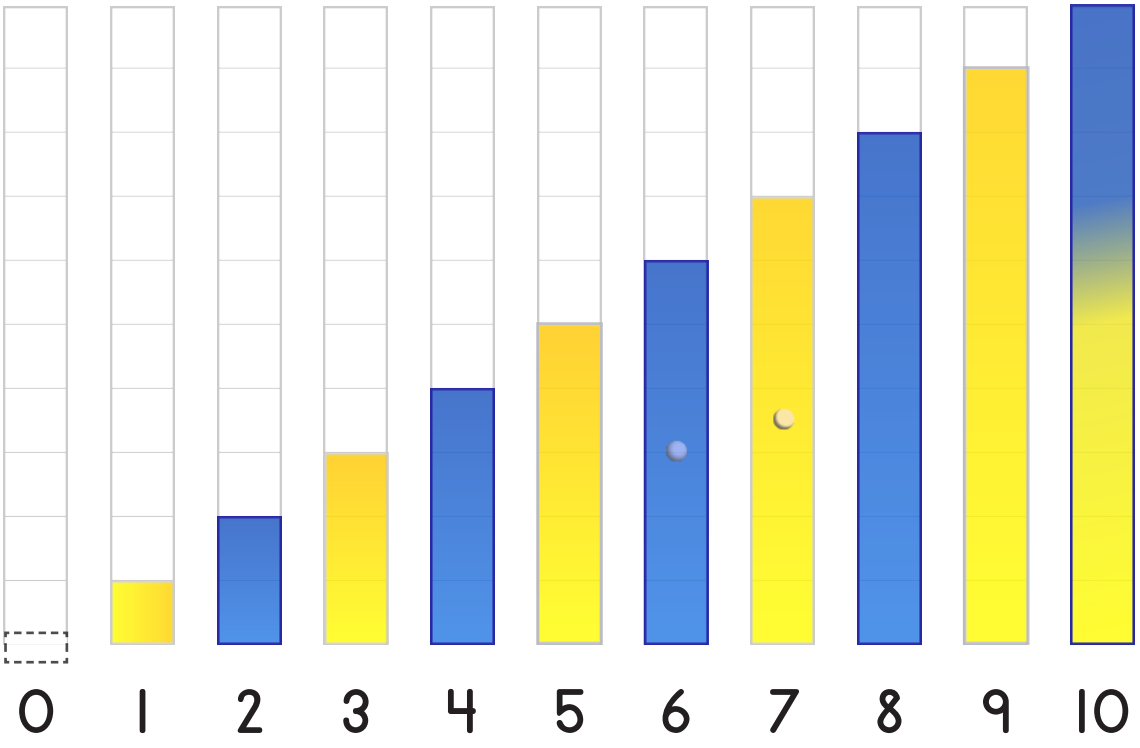
The Symphony Math Worksheets provide extended practice using the Multiples Ways of Knowing from the Symphony Math program. Students should work through all worksheets in the order given:

Worksheet	Purpose	Instructions
Manipulatives	Use a visual model to represent the concept.	Create bars, dot cards, or number lines for each item.
Bridge	Connect symbols to their visual representations.	Create objects, numbers, and symbols to complete each item.
Symbols	Understand the concept at the abstract level.	Create numbers and symbols to complete each item.
Apply	Extend understanding to real-life problem solving.	1) Read the story presented at the top of the page. 2) Create a number model of the full solution. 3) Write the number sentence that matches the model.

Group Learning

The Symphony Math Extra Practice materials are designed to promote a conversation about the Big Ideas in math. One-on-one or small group instruction with the materials is recommended for students who need more time to make connections between the mathematical concepts in the Stage and the application of those concepts in their math curriculum.

Symphony Bars: Stage 3



Dot Cards: Stage 3