Whole Number Representations – Matching and Sorting with 1-digit Numbers

First introduce each representation or model of the numbers 1 through 9, and have the children create multiple models for understanding the numbers (e.g., on a ten frame, on an open number line, with objects and pictures, with dot patterns and/or dominoes, and with addition and subtraction expressions). Also include the word and numeral representations. These activities can be structured separately and in combination with other lessons such as Number Recognition – Number Lines, Number Recognition – Book, and others. Show the students how to create each representation and understand the connections between them, for example by asking them to show the number of a hops on a number line by drawing the same number of dots on a ten frame, and in many other combinations among these representations.

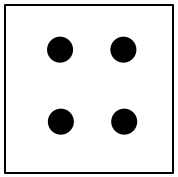
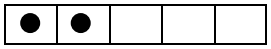
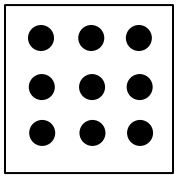
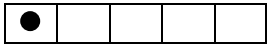
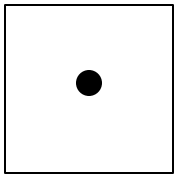
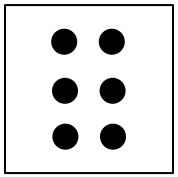
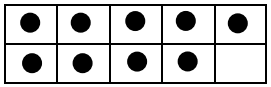
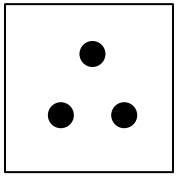
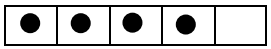
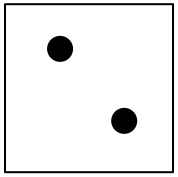
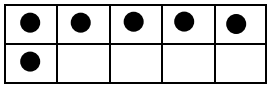
Once the students have been exposed to the multiple representations, print out the Number Match sheets without color. Have the students work in pairs while each having their own sheets. Tell the students to color all ways of showing one number in the same color. Have the students take turns showing each other and then coloring all representations of a given number in the color. For example, the students might color all representations of 1 red, 3 blue, etc. You may want to have all students work on one example first together, or simply tell the students what color to use for each number.

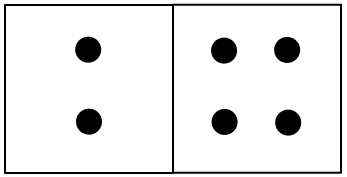
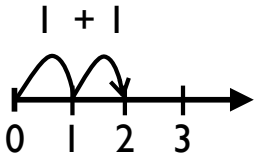
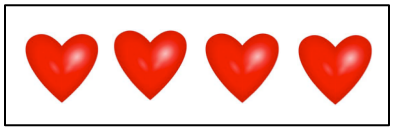
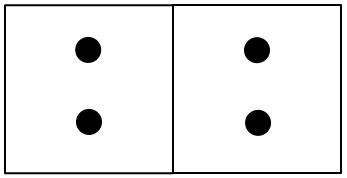
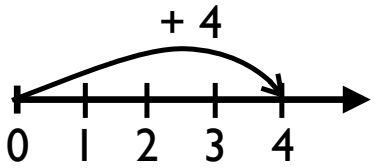
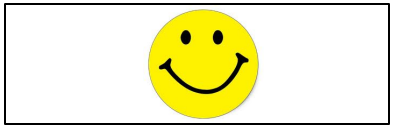
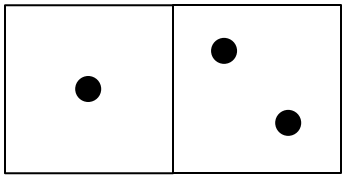
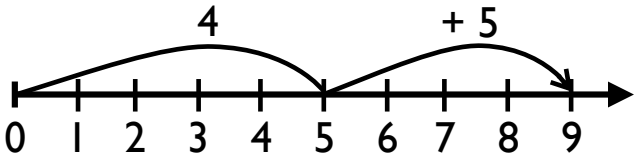
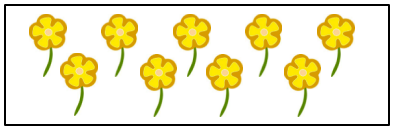
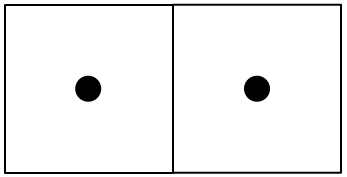
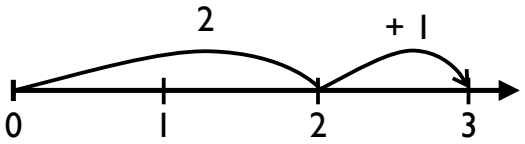
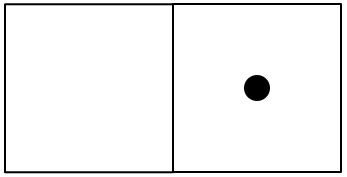
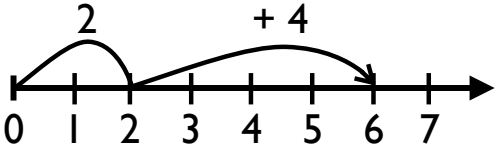
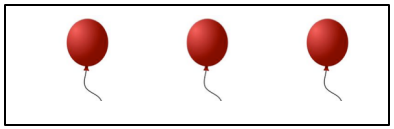
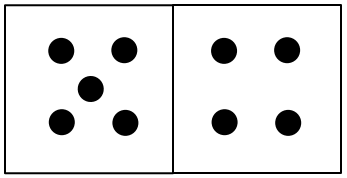
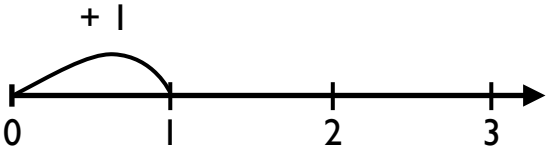
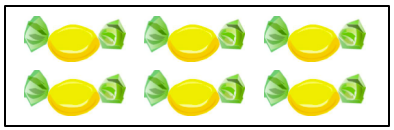
Ask the students to tell each other, and then the whole class, how they know that they have colored correctly. In other words, have the students justify their matching. For example, a student might be facilitated to say, "I colored the three dots blue and the open number line with three hops blue because each one shows how to show three. On the dots I can count one, two, three dots. On the open number line I can count one hop, two hops, three hops. So each one is three." The goal is to help students, through supportive and guided questioning, to justify their mathematical thinking. Be careful not to have students simply 'parrot' back phrases that they do not understand, but instead help them explain their thinking. You can model this by thinking out loud yourself about how you might decide to match two number representations together.

Variations and extensions:

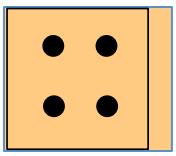
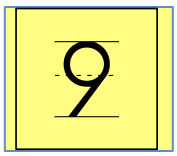
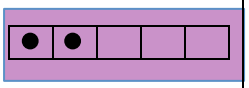
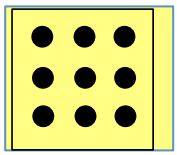
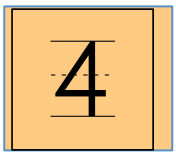
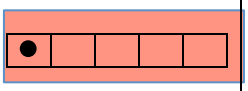
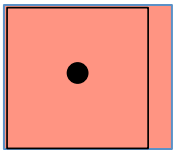
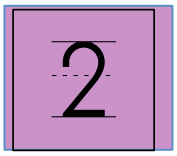
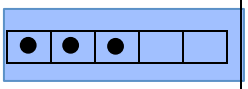
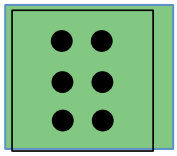
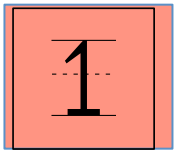
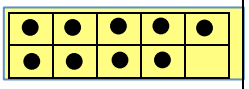
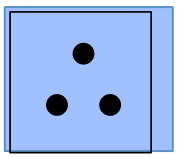
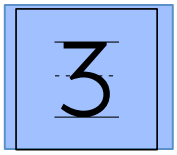
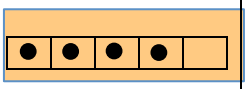
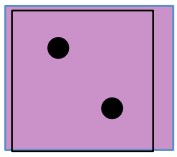
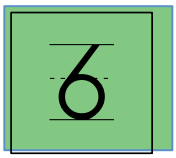
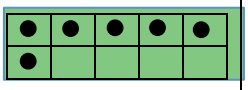
- Have students create the sets of representations for the other 1-digit numbers not included in this set (i.e., 5, 7, and 8).
- Use the sheets to show students a sample and then have students draw their own versions of all 1-digit numbers on cards. They can create their own sets of number representations and use them as a "deck" of cards to sort in different ways.
- Have the students add a set of cards for the number 0.
- Cut apart the representations and have students work in pairs to sort the "cards" into piles based on your instructions. The students can sort the cards by number. You can also have them sort or match the cards by other categories. For example, ask the students to match two cards together that show a difference of one. A student might show the dots card with six dots and the ten frame card with seven dots as one possible answer.
- Use the sheets as a sample and have students create similar representations for other kinds of numbers as they progress to more advanced topics, e.g. teen numbers.

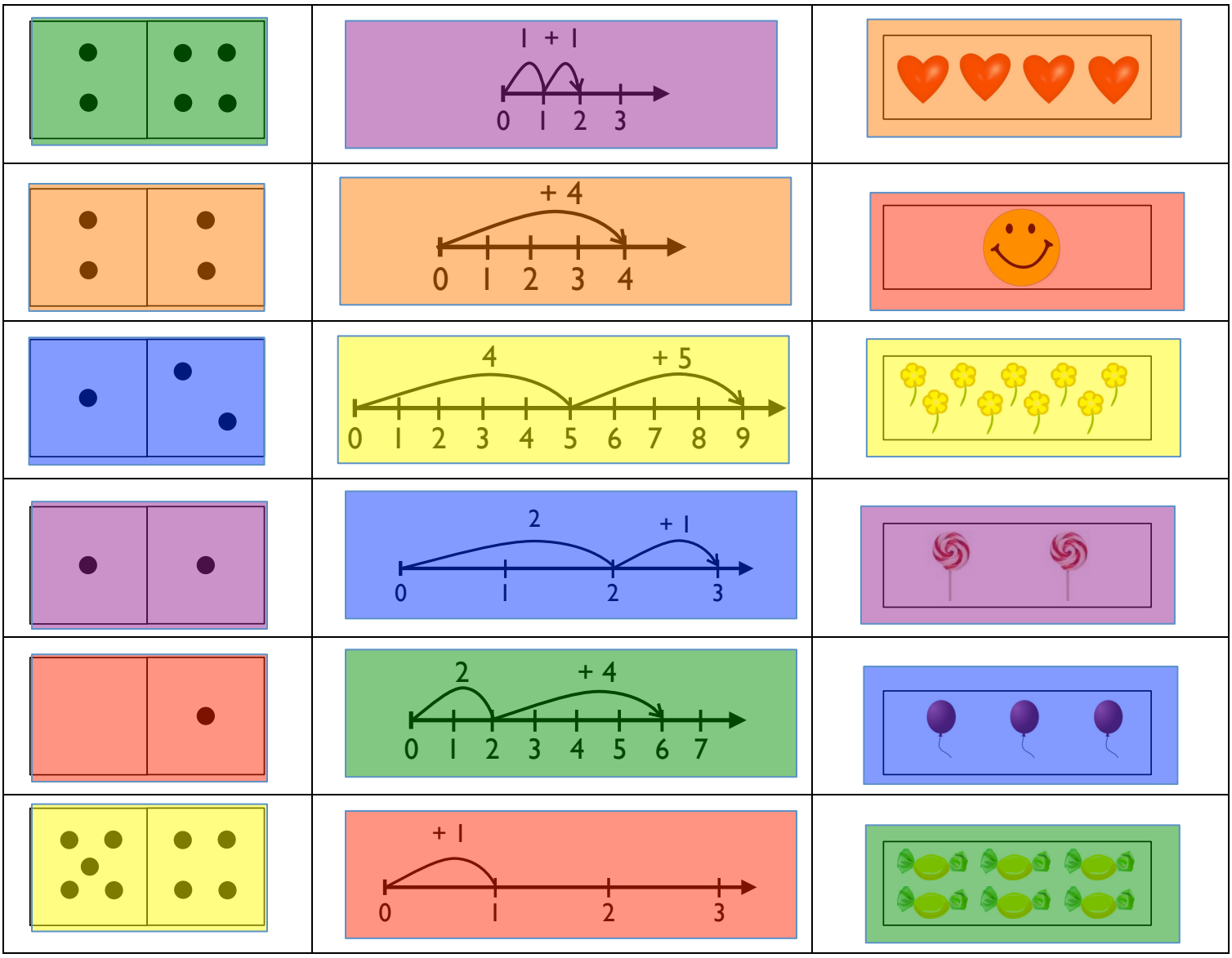
California Common Core Standards: K.CC, K.OA, 1.OA.4, 1.OA.5
California State Standards: K NS 1.0, K NS 2.1, 1 NS 1.3, 1 AF 1.2

one		9		2 + 1	6 – 3
three		4		4 + 2	9 – 5
four		2		6 + 3	8 – 7
six		1		0 + 1	5 – 3
nine		3		1 + 1	10 – 1
two		6		3 + 1	9 – 3

	 1 + 1 0 1 2 3	
	 + 4 0 1 2 3 4	
	 4 + 5 0 1 2 3 4 5 6 7 8 9	
	 2 + 1 0 1 2 3	
	 2 + 4 0 1 2 3 4 5 6 7	
	 + 1 0 1 2 3	

Sample Solution

one				2 + 1	6 – 3
three				4 + 2	9 – 5
four				6 + 3	8 – 7
six				0 + 1	5 – 3
nine				1 + 1	10 – 1
two				3 + 1	9 – 3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