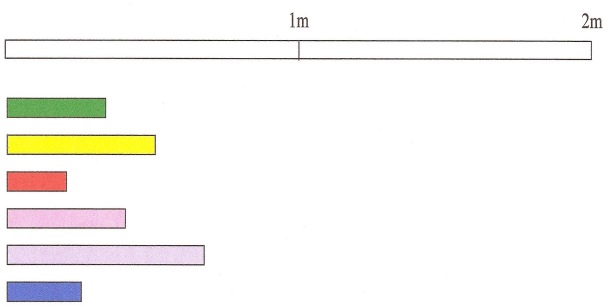
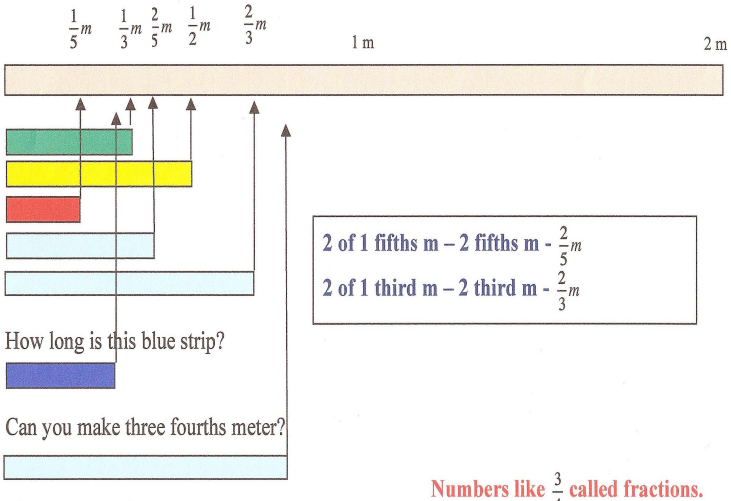
Summary of Video Excerpts (Lesson Series 1): Introduction to Fractions in a Linear Measurement Context		
not included	[Warm up lesson so Dr. Takahashi (Dr. T.) gets to know the students]	[*Displaying the dates*: How many number cards do we need to display all the dates (1 through 31) on the classroom wall?]
FRACTIONS LESSON 1 Video: trt 14 min. 11 sec. at tinyurl.com/ fractionalparts	**How Can We Express Fractional Parts (Unit Fractions)?** Based on *Mathematics for Elementary School 3B* (Hironaka et al., 2006) pp. 57-58. **Goal:** Students will become aware of fractions in everyday life and will understand that fractions are used to express an amount obtained as a result of equal partitioning and can be used to express quantities less than 1 (Lesson 1 uses only unit fractions).	*Expressing unit fractions* Students are asked what numbers on a trail sign represent. "North Shore TR 3" (what does the 3 mean?) and "Lake Front $\frac{1}{4}$" (what does $\frac{1}{4}$ mean?). The class discussion distinguishes whole numbers from fractional parts. Dr. T. shows the students a 2-meter tape strip that represents the length around a tree trunk and asks students to express this length in meters. He then shows a tape strip that is a bit longer than 1 meter. He asks: How can we express the bit longer (the fractional part left over from measuring with the meter) using the 1-meter tape strip as a reference? Students are given a 1-meter paper tape strip and a strip of green card the same length as the fractional part. Students discover the green strip fits into 1 meter exactly 3 times and is therefore $\frac{1}{3}$ meter. Dr. T. hands out a second, yellow piece of card (a different fractional length) and asks students to express its length using the 1-meter tape strip as a reference. Students discover it fits exactly 2 times and is therefore $\frac{1}{2}$ meter. Students are asked to predict the length of a third, red card piece, and they discover it fits into the 1 meter exactly 5 times, and is therefore $\frac{1}{5}$ meter. Throughout the lesson, Dr. T. encourages students to measure carefully using the card pieces and to use meters to express the length of the fractional part ("one third *what*?" and "one fifth *what*?").
FRACTIONS LESSON 2 Video: trt 17 min. 45 sec. at tinyurl.com/ fractionslesson2	**How Can We Express Fractional Parts (Non-unit Fractions)?** Based on *Mathematics for Elementary School 3B* (Hironaka H. et al., 2006) pp.58-59.	Dr. T. shows examples of student journals from the prior day. He highlights the different ways students expressed one-third meter: $\frac{1}{3}$ of a meter, one third of a meter, one third meter, $\frac{1}{3}$ *m*, $\frac{1}{3}$ meter. In response to a question one student wrote in her journal "how many $\frac{1}{5}$ would it take to make 7*m*?" Dr. T. has made a 7*m* strip of tape and asks students to think about the answer.

	Goal: Students will understand that a fraction can be considered as a collection of unit fractions.	Students are again asked to express the length of a mystery length tape strip ($\frac{2}{5}\,m$) and a 1-meter tape strip. One group of students uses the chart (summary of the lesson) from the previous day to discover that the $\frac{2}{5}\,m$ strip is twice the (red) $\frac{1}{5}\,m$ strip and therefore $\frac{2}{5}\,m$. Another group becomes confused when the mystery strip goes into 1 meter two and a half times and calls it both $\frac{2}{5}\,m$ and $\frac{2}{3}\,m$. Class discussion explores why $\frac{2}{5}\,m$ does not go into 1 m an even number of times. A second mystery length tape strip ($\frac{2}{3}m$) is investigated; once again, groups use several methods, including measuring with the $\frac{1}{3}\,m$ strip and folding the mystery strip so that it fits an even number of times.
FRACTIONS LESSON 3 Video: trt 23 min. Day 4 (cont.) at tinyurl.com/ fractionsize	**Fraction Size** *Mathematics for Elementary School 3B* (Hironaka H. et al., 2006) pp.60. **Goal:** Students will learn fraction notation. Students will become aware that a fraction can be put on a number line.	The lesson again begins with review of selected student journals to revisit the prior day's learning. The whiteboard display and a sheet inside the students' math journals (see below) show the size of the various fractional parts investigated during days 2 and 3 in relation to each other and to the 2-meter strip.  Students investigate another mystery piece using the 1-meter tape strip as a reference; students discover it is $\frac{1}{4}\,m$ by different methods including iterating the card piece exactly 4 times and folding the 1-meter tape strip into four equal parts. Students are asked to make a $\frac{3}{4}m$ tape strip from a tape strip of unclear length (slightly less than a meter, with a torn end). Students use different methods to create $\frac{3}{4}\,m$ (folding the mystery strip in fourths or using known lengths to measure), resulting in different length strips. Through discussion, the students realize that one group found $\frac{3}{4}\,m$ whereas the other group found $\frac{3}{4}$ of the original tape.

		Fraction notation is formally introduced using a sign from the classroom: 3 numerator 4 denominator Groups create a mystery fraction strip of their choice (using the color cards - green, yellow, red and blue), keeping the length secret so that other groups can guess it. **We have done so far.....**  **Chose one of the color strips and express a fraction by using a tape strip.** How many $\frac{1}{5}$ would it take to make 7 meters? **Numbers like $\frac{3}{4}$ called fractions.** **4 is called denominator to express the unit, fourth.** **3 is called numerator to express how many of the unit.**