

Dear parents,

This year we have the opportunity to work with a national math consultant, TJ Jemison, who lives here in Vermont. He has been hired to work with the EES teachers as we transition to the Common Core State Standards (CCSS) and develop our math program to best meet the needs of our students here in Essex Town. In addition to this work TJ is doing some independent research around kindergarteners' development of mathematical skills and ideas. This research involves teaching students an additional way to name the teen numbers. He is hoping to present at a national math conference in April of 2014 if he is able to collect enough data. The Kindergarten teachers and I are fully supportive of his research and very interested to see the potential positive impact on students' mathematical development. Here TJ explains his reasoning for doing this:

My background and experience as a math content expert in the early elementary grades over the last 10 years has led me to know that many students in the U.S. struggle with the teen numbers. Sometimes we do not see the effects of this struggle exposed until later grades when it is much harder to correct. There are several reasons for this and potentially negative consequences when students don't grasp these numbers. My hypothesis is: if we intentionally and systematically incorporate into kindergarten instruction the concept that the teen numbers can be thought of as "10 + x" young children will more readily see the pattern in our base ten number system and struggle less with the skills of acquiring numeral names and sequences. Adding the language of the teen numbers from eleven, twelve, etc... to "ten-one", "ten-two", etc... (only for 11-19) will make learning these numbers easier for young children.

One of my inspirations for this study is that many Asian languages have no word for the numbers 11 to 19 (as well as decade numbers of 20, 30 and so on). They call them "ten ___" with their word for ten and their word for the numerals 1-9. If we translated this to English it would sound like "ten- one" for 11, "ten-two" for 12, and so on. For their numbers beyond the teen numbers they would call 20 "two-ten", 21 "two-ten-one" and so on. As you are probably aware the U.S. trails many of these countries in international tests of mathematical achievement.

In order to conduct this study I am asking for your permission to have your child be part of the study and for me to anonymously use their assessment data. This is data that is already part of what kindergarten teachers in Essex collect- no new testing will need to be done for this study. For further details about this study please see the back of this sheet.

Please join the kindergarten teachers, TJ, and I in supporting this important research by signing below and allowing your kindergartener to be part of this study.

Peter Farrell

Please sign and return the bottom portion to your student's classroom teacher:

I (sign your name) _____ give permission for my child (print their name) _____ to participate in the kindergarten study.

Here TJ provides further information and details of the study:

Several of the challenges of the teen numbers are highlighted below. First, the teen numbers have no pattern within their “family of numbers” the way the 20’s, 30’s, 40’s and so on do. “Eleven, twelve, thirteen and fifteen” do not follow the same pattern as the other teen numbers and even the ones that do are different from the other number “families”. 12 is especially troublesome for many students, who confuse it with 20 and 21.

Second, the teen numbers are read the opposite of all the other numbers. When reading the numeral 16 one looks at the 6 first to get the “six” and the 1 next to get the “teen” (or ten)- therefore reading these numbers from right to left. In addition, most students do not make the connection between “teen” and “ten” on their own. All other double-digit numbers are read from left to right (the same way we read words). This creates great confusion for many of our young learners.

As you are probably aware when looking at international rankings of math test scores the U.S. trails many Asian nations (for many different factors). I believe that one of the largest factors is that their children have a head start just from their parents and other caregivers counting in a pattern that makes sense versus our English language system which is confusing through the teen numbers. Often students need to hear the pattern that develops in numbers beyond the teens -- which often does not happen until they are older and already behind their international peers.

I am hoping to do this research without support from any outside agencies at this time and am hoping that the parents of the Essex Kindergarten class will consider supporting me as I explore this topic. I already have the support of the Essex Elementary administration and Kindergarten teachers if allowed to go forward. I believe that all Kindergarteners will benefit from this instruction and will assist them in making connections to our number system and patterns at an earlier developmental stage due to a more logical sequence of numbers. I predict that fewer, if any, students will become frustrated with learning the teen numbers while using this new system.

As part of this study I would help the teachers instruct their students on how to name the teen numbers in an additional way. We will continue to accept the given names for 11- 19 while at the same time encouraging students to demonstrate they can also understand what those numbers mean by calling them by our new names as well. My theory is that during Kindergarten these students will achieve such a solid understanding of the number system early on that they will be able to transition back to the “normal names” by the end of Kindergarten or the start of First Grade. I have used this strategy with struggling First grade students in the past with much success and have always wondered how many students we could prevent from struggling if they understood the teen numbers at an earlier age.

In order to be able to distinguish if this strategy is effective I plan to have about half of the Essex Kindergarteners learning this “new system” while the other half learns the teen numbers as they always have. Parents of students who are being taught the teens in an additional way are encouraged to allow their children to use these number names at home as well. In school we hope to have students say “ten- two” to refer to 12. If a student calls it “twelve” we will ask them “and what’s the other name we call that number?”

If the data shows that there are any negative side effects the study will be suspended immediately. I am confident we will see the opposite effect. My plan is to follow the students for this school year.

Thank you for supporting this study,