Use the *Fractions Tutor* with your students!

Spring classroom study—grades 4 and 5

An opportunity to use new educational technology

We are looking for schools that will partner with us in research on fractions learning for grades 4 and 5. The planned study will take place in late spring 2014.

Advantages of participating in the research:

- Students in participating schools will work with research-based fractions tutoring software that has proven to be effective with thousands of students.
- Students will have the opportunity to develop a deeper understanding of fractions and develop fluency with fractions problems.
- Students will use tutors developed by a university with 30 years of successful tutor research.

These studies will contribute to new knowledge about how to make tutoring software even more effective for future generations of students.

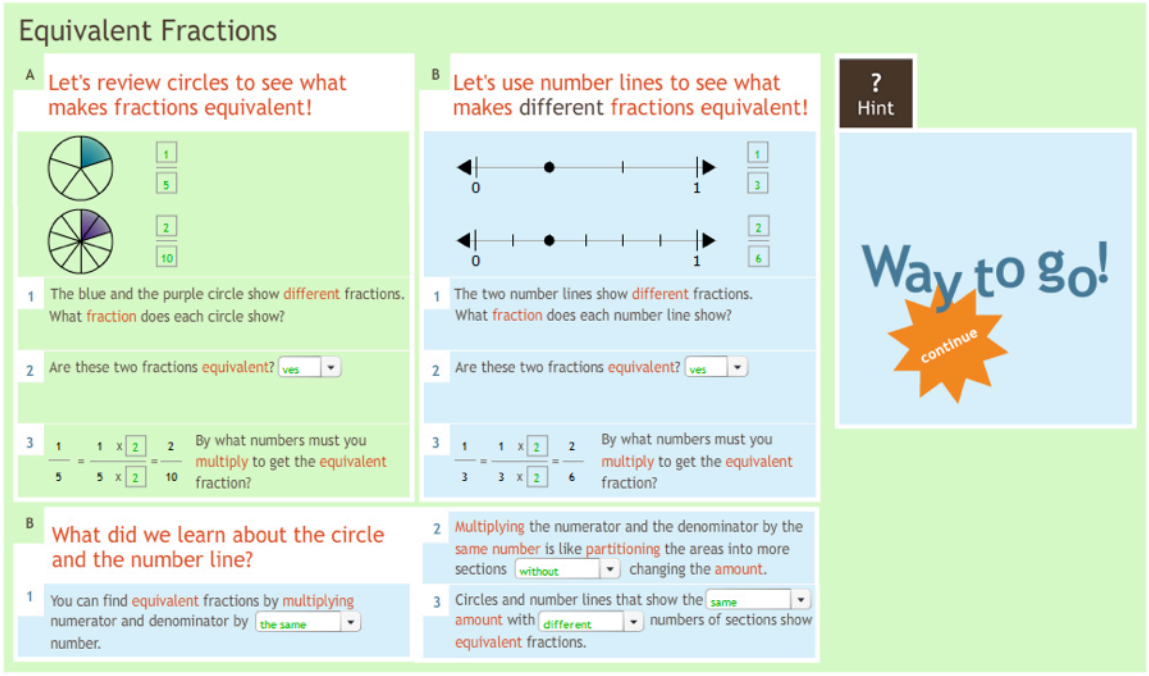

Figure 1: *Fractions Tutor* problem about equivalence

The *Fractions Tutor* software

We have built the web-based *Fractions Tutor* (https://mathtutor.web.cmu.edu) over the past five years with research grants from the National Science Foundation and the US Department of Education. The software uses the *Cognitive Tutor* technology, which is based on over 30 years of research into how students think, learn and apply new knowledge in mathematics. The *Fractions Tutor* guides students with detailed help as they learn to solve challenging math problems. The tutor is aligned with PA standards, the Common Core, and NCTM Standards. The table below lists the topics covered in the tutor.

Proven effectiveness

Our research shows that the *Fractions Tutor* helps students gain a better understanding of fractions, and we expect the same in our new research study. We have conducted five classroom studies, in which over 3,000 students used the *Fractions Tutor*. In our last study, students' test scores improved by 32% relative to their scores before working with the *Fractions Tutor*. On test items that measured students' deep understanding of fractions concepts, students scored 48% higher a week later. Our informal classroom observations indicate that students like working with the Fractions Tutor.

Goals of the new study

The goal of our new research is to make the tutoring software even more effective. We will add a wider range of fractions activities for students to solve. Further into the future (though not yet this spring) we will use machine learning technology to make the tutor even better at providing individualized instruction. Each individual student will get a different sequence of problems, selected automatically by the tutor, based on individual need.

If you are interested in partnering with us, please provide contact information on the signup list (no obligations – you are just expressing interest at this point– and we will be in touch as soon as we can). We will not share your information with anyone.

Contact Information

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Topics Covered in the *Fractions Tutor*

Problem Types per Unit	**Alignment with Standards**
1. Naming Fractions	PA Standard 2.1.3.B, 2.3.3.B, 2.1.5.D, 2.4.5.A, 2.4.5.B; Common Core Standard 3.NF.1, 3.NF.2, 3.NF.3
2. Making Graphical Representations of Fractions	PA Standard 2.1.3.B, 2.3.3.B, 2.1.5.D, 2.4.5.A, 2.4.5.B; Common Core Standard 3.NF.1, 3.NF.2, 3.NF.3
3. Reconstructing The Unit	PA Standard 2.1.3.B, 2.3.3.B, 2.1.5.D; Common Core Standard 3.NF.1, 3.NF.2
4. Naming Improper Fractions	PA Standard 2.1.3.B, 2.3.3.B, 2.1.5.D; Common Core Standard 3.NF.1, 3.NF.2
5. Making Graphical Representations of Improper Fractions	PA Standard 2.1.5.D, 2.4.5.A, 2.4.5.B; Common Core Standard 3.NF.1, 3.NF.2
6. Equivalent Fractions - Concepts	PA Standard 2.1.8.A; Common Core Standard 4.NF.1, 3.NF.3
7. Equivalent Fractions - Procedures	PA Standard 2.1.8.A; Common Core Standard 3.NF.3, 4.NF.1
8. Ordering Fractions	PA Standard 2.2.8.B; Common Core Standard 3.NF.3, 4.NF.2
9. Adding Fractions	PA Standard 2.2.8.B; Common Core Standard 5.NF.1, 4.NF.3
10. Subtracting Fractions	PA Standard 2.2.8.B; Common Core Standard 4.NF.3, 5.NF.1