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Number and Numberation Lesson Using TI Calculator

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4. CMST SCOLLARCITY Lesson Plan Template-Lesson Plan using **TI Technologies**,
(Due Tuesday, July 27th)

Submit as hard copy AND electronically through ANGEL

Name: Helen L. Fox
Grade Level(s)/Subject taught: Mathematics 7
Objectives: (Remember... <i>How will the modeling tool help the student better learn the objective?</i>) Students will be able to convert fractions, decimals, and percents using the TI-84 to solve applications. The TI-84 will provide the student with an easier, faster way to solve applications involving converting fractions, decimals, and percents AND serve as a strategy to check work.

Items to include in your **TI Technologies** lesson plan: (use *your* area/discipline/concepts).

For the math teacher:

1. Write the Mathematical Concept or “key idea” that TI Technologies will be used to teach: (e.g. Students use mathematical modeling/ multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships)

Number and Numeration: Students use number sense and numeration to develop an understanding of multiple uses of numbers in the real world, the use of numbers to communicate mathematically, and the use of numbers in the development of mathematical ideas. - Students will understand, represent, and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, and expanded notation). - Students will recognize order relations for decimals, integers, and rational numbers.

I plan on introducing my seventh grade mathematics students to the TI-84 Plus Silver Edition calculator in small pieces throughout the year. I do not think it will be available for my class to have a complete set of calculators. I know my school (Frederick Douglass Preparatory School) has a few (5-10) available for limited use at this time. I have also had some unfortunate situations last year where several TI-30s were carelessly broken or stolen by students.

Initially I wanted to put together a lesson plan using several calculator buttons and/or tutorials from the TI-84. However, I decided it would be more practical to put together a simple lesson plan with only a small amount of TI-84 involvement because I will be able to use this lesson next year. One area of extreme importance in seventh grade is for students to convert fractions to decimals to percents and vice versa. My lesson will show students how they can use the calculator to easily and quickly adapt from one expression (e.g. fraction, decimal, or percent) to another. Not only does the calculator make it easier and quicker for students to do so, it also can be used to check work which has already been done manually.

Before introducing the calculator, I feel students should exhibit a high degree of proficiency in being able to convert these expressions manually. They should know that to convert a fraction to a decimal, they must divide the numerator by the denominator. They also must make a decimal into a fraction by figuring out what the decimal reads as (e.g. 0.75 is read as seventy-five hundredths and written as $75/100$ and reduced to $3/4$). Percents are found by multiplying a decimal value by 100 or by moving the decimal point of a decimal value two spaces to the right. Therefore 0.75 would be equivalent to 75%.

1.) How will you assess the prior knowledge of the student?

Prior knowledge of the students can be assessed prior to the lesson by use of bellwork and review and questioning. I can ask students if they are familiar with this calculator or similar calculators. (I did have a student last year that used a TI-83 Plus.)

2.) How will you begin the lesson?

The lesson will begin with my asking the Essential Question and by showing the calculator on the projector screen. I will perform a few simple operations like addition, subtraction, etc.

3.) What are the teacher and students doing every 5-10 minutes?

See the lesson plan for time allowed for each portion of the lesson.

4.) How will you assess the learning for this lesson?

I will use the rubric attached. I will also be moving about the classroom during the activity to monitor how well each group is doing and to check that each student has opportunities to use the calculator.

5.) How will TI be integrated into your teaching?

This lesson will be implemented early in the school year and the TI-84 may have been used only once or twice prior to this lesson. The TI-84 will be used AFTER manual calculations are completed. This will be used as a check for calculations already done and to show students how much easier and quicker it is to make calculations with the TI-84. Because students must understand the important concepts that accompany conversions, the calculator just confirms that they have calculated correctly and that, if used properly and good information is input correctly, the calculator can give them quick and easy output that is correct.

TI-84 Lesson Plan Assignment
Teaching with Technology
Helen L. Fox
July 27, 2004

Classroom Notes: Consists of approximately 30 7th grade students. Class time is approximately 75 minutes. The class meets daily Monday through Friday. Logistics: Students will work in groups of 3-4 (and may have to share calculators). Students will pick up bellwork assignment and other class materials (group worksheet) when entering classroom. Students have been learning how to manually convert fractions, decimals, and percents.

Essential Question (on blackboard) – How can we use our TI-84 calculators to determine equivalent fraction, decimal, and percent values?

Learning Objective – Student will be able to convert fractions, decimals, and percents using the TI-84 to solve applications.

Materials: TI-84 Plus Silver Edition
Viewscreen
Overhead projector
Students will need TI-84 calculators, paper, pencils
Peer Evaluation Form (for group work)
Rubric for each group

Lesson plan outline:

- Bellwork (5 minutes – timing begins when all students are at their desks)
(Bellwork will review how to interchange fractions, decimals, and percents involving division and multiplication, and reducing fractions when necessary and is based on prior learning from recent previous lessons on this subject.)
- Bellwork review (5 minutes)
- Review of assignment from yesterday (5 minutes)
- Essential Question introduction and discussion (5 minutes)
- Lesson (20-25 minutes)
 - Model how to change a fraction into a decimal (by using long division first (by dividing the denominator by the numerator); then showing the division by using the TI-84 calculator. Use $\frac{3}{4}$, $\frac{5}{8}$, $\frac{3}{10}$, $\frac{1}{3}$, $\frac{1}{5}$. (Allow students to come up for $\frac{1}{3}$ and $\frac{1}{5}$ – or more if necessary). Then, show students manually how to convert the decimal into a fraction and how to use the calculator. Use 0.7, 0.43, and 0.785. (Remember to reduce all fractions!). Then, show how to use the calculator to find fractional equivalents. Discuss how fractional equivalents are already reduced. Call on two students to come up to front of the class to model how to do 0.35 and 0.063.
 - Model how to change a fraction into a percent manually (using strategy above and then multiplying the answer by 100. Use $\frac{2}{3}$, $\frac{1}{4}$, and $3\frac{1}{2}$. Review the $3\frac{1}{2}$ and why the percent is 325%. Then, use the calculator to change fractions

into decimals and then into percents. Then, work backwards by taking percents, changing numbers into decimals, and, finally changing the decimals into fractions. Call on two students to model 50% and 150%.

Activity: (20-25 minutes) Break students into groups of 3-4 (involves moving desks). Each group must have at least one calculator. Emphasize that ALL group members must have the opportunity to practice and to show group members how to use the calculator to convert fractions, decimals, and percents! Give each group an assignment worksheet with five warm-ups using calculators to determine values set up in a table with headings of "Fractions", "Decimals", and "Percents". Assignment sheet will have a table with five fill-in-the-blanks. After the warm-ups, there will be four questions that require applying the concepts in word problems to solve. For example:

Donyell has just finished her Social Studies quiz. She knows she got four out of five questions correct and missed the fifth question. What percent will she get on her quiz?

Peer evaluation – After students put the room back into rows and return calculators, they have 5 minutes to fill out a peer evaluation form which is given whenever there is a group work activity. The form asks them to rate their performance and that of their peers on a scale of 0-4 as well as to describe any difficulties the group may have had (with group work as well as with the assignment).

Closure (5 minutes) Discuss the essential question and how the TI-84 makes it easier to make the calculations – and also how it can serve as a checking strategy. We will review using 22.5% as an example (.225 and $\frac{9}{40}$) before class is dismissed.

Assessment: Students are given a daily participation grade of 0-4. This is based on participation and cooperation. In addition, all groupwork assignments have two factors: peer evaluation and how well the groups completed their assignment.

Rubric: 20% is determined by the peer evaluation. If group members all rate a 4, each member would receive 20%, etc. from the group. The rest of this assignment would be according to the rubric below: The assignment gives a table with five questions (worth 4 points each for a total of 20 points) and four word problems (worth 15 points each for a total of 60 points). Rubric is attached.

PEER EVALUATION FORM

Name: _____

Date: _____

Home Base: _____

The members of my group today were:

1. Rate: 0 1 2 3 4

2. Rate: 0 1 2 3 4

3. Rate: 0 1 2 3 4

4. Rate: 0 1 2 3 4

Rate each member under for cooperation and participation from 0 – 4 and circle the number next to his/her name above. (4 is the highest rate; 0 is the lowest.)

Did all members of your group contribute evenly? If not, please make a comment below:

One thing I learned from today's lesson was:

Rubric for TI-84 Plus Lesson Plan – Fractions, Decimals, and Percents

Points for Peer Evaluation 0 = 0 1 = 5 2 = 10 3 = 15 4 = 20 (out of 20)	Student has not participated and has been removed from the group. 0 pts.	Student does not participate in group work and has been disruptive or talkative and off task. Student was unable to show an understanding of converting fractions, decimals, and percents on TI-84. 1 pt.	Student has participated little in group work, but was off task frequently. Student was unable to show an understanding of converting fractions, decimals, and percents on TI-84. 2 pts.	Student has participated in group work and has cooperated; however, he/she was off task once or twice. Student was able to show an understanding of converting fractions, decimals, and percents on TI-84. 3 pts.	Student participated in group work and stayed on task until the activity was completed and showed good effort. Student was able to show an understanding of converting fractions, decimals, and percents on TI-84. 4 pts.
Points for Part 1 questions on ClassWork Assignment 5 questions @ 4 pts. per question. (out of 20)	Did not answer the question or show any work 0 pts.	A small error was made resulting in an incorrect answer, but the correct strategy was clear. Student checked all answers on the TI-84. 2 pts.	Question was answered correctly and the strategy was clear. Student checked all answers on the TI-84. 4 pts.		
Points for Part 2 questions on ClassWork Assignment 4 questions @ 15 pts. per question. (out of 60)	Did not answer the question or show any work. 0 pts.	A small error was made resulting in an incorrect answer, but the correct strategy was clear. Student checked all answers on the TI-84. 8 pts.	Question was answered correctly and the correct strategy was clear. Student checked all answers on the TI-84. 15 pts.		