READING TO CALCULATE

OUTCOMES
Students will read and follow directions for using the Casio calculator in order to accurately solve calculations involving the fraction function key.

GED DESCRIPTORS
Language Arts-Reading
Social Studies
Science
Mathematics
Language Arts-Writing

ROLES
Family Worker Community

PROGRAM TYPE
ABE	Urban
GED	Rural
ESOL	Homeless
Family Literacy	Institutional
Workforce	Corrections

LEARNER LEVEL
4-5

KEYWORDS
81: **Education** > reading
1169: **Math** > calculator

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TECHNOLOGY INTEGRATION
http://www.mvaea.com/casio.html
http://www.ket.org/GED2002

STANDARD Read With Understanding

COPS	ACTIVITY ADDRESSES COMPONENTS
Determine the reading purpose.	Students will determine how these written instructions on solving fraction problems will help them to use the calculator for a portion of the math GED test. Students will also have an opportunity to think about how learning to read instructions will help them in all their roles as workers, family members, and community members.
Select reading strategies appropriate to the purpose.	Students will need to use a variety of reading strategies to accomplish the task of reading written instructions (clarifying, sequencing, rereading, visualizing, and connecting to prior knowledge). When reading they will need to follow steps in sequential order (look for clue words or numbers that show sequence), think about what they already know about calculators, look at pictorial aids (numbers and symbols depicting the steps), and self-question themselves while reading (What step should come next? Does this answer make sense?).
Monitor comprehension and adjust reading strategies.	Students will monitor their comprehension by trying to solve fraction addition and subtraction problems. They will adjust their reading strategies by rereading unclear steps in the instructions, trial and error attempts at solving the fraction problems, and self-questioning while reading.
Analyze information and reflect on its underlying meaning.	Students will determine if their answers to the fraction problems have the correct form and if they make logical sense.
Integrate it with prior knowledge to address reading purpose.	The answers on the pre-task assessment questions will show what students already know about following instructions, calculators, and fractions. Students will need to take what they already know and use it with the new information written in the task to solve fraction problems using the Casio calculator.

READING TO CALCULATE

OUTCOMES	**STUDENT GOALS**	MATERIALS Calculators & Instructions
Students will read and follow directions for using the Casio calculator in order to accurately solve calculations involving the fraction function key.	GED students are concerned about the changes that have occurred on the 2002 GED test. The sections they are most curious about are the math area and want to learn how to use the Casio fx-260 calculator.	**NRS EFL 4-5** TIME FRAME approximately 4 hours over 4 days

STANDARD	LEARNER PRIOR KNOWLEDGE
Read With Understanding	This activity gave students the opportunity to learn the keys and their functions on the Casio calculator and also helped students solve fraction problems using a calculator. Sample GED questions that focused on using the fraction function key to solve addition and subtraction fraction problems could be used as a pre-assessment.

COPS	**BENCHMARKS**	**ACTIVITIES / CURRICULAR RESOURCES [REAL-LIFE APPLICATIONS]**	**ASSESSMENT / EVIDENCE**
Determine the reading purpose. Select reading strategies appropriate to the purpose. Monitor comprehension and adjust reading strategies. Analyze information and reflect on its underlying meaning. Integrate it with prior knowledge to address reading purpose.	2.4.1, 2.5.1 2.4.2, 2.5.2 2.4.3, 2.5.3 2.4.4, 2.5.4 2.4.5, 2.5.5 2.4.6, 2.5.6 2.4.7, 2.5.7 2.4.8, 2.5.8 2.4.9, 2.5.9 2.4.10, 2.5.10 2.4.11, 2.5.11	Step 1 – Discuss with students times when it has been important to follow directions. Talk about what could happen when directions are not followed. Discuss emergency situations and learning situations, such as starting an assignment and doing it incorrectly, or answering the wrong question on a test. Focus on the importance of careful reading and following sequence. Show (or, if necessary, introduce) the standard *Read with Understanding.* Students discuss what each component of performance (COP) means within the context of reading directions. Answers can be recorded on chart paper for future reference and/or discussion. Step 2 – Give students the instruction sheet for basic and fraction calculations from the Casio calculator or a teacher-created set of instructions along with the Casio calculators. Allow time for students to examine the calculator if this is the first time they have used them. Explain parts of the calculator using a chart or overhead of the calculator key pad, including the symbols on the keys and the yellow words above the keys, and how the shift key works. Have the students read the instructions for using the fraction function key and work a few fraction addition and subtraction problems to practice using the calculator.	Evaluate students' ability to *Read with Understanding* by having them read and follow written instructions on how to solve addition and subtraction fraction problems using the Casio fx-260. In a pre-task activity, students determined how many fraction problems they should get correct to demonstrate their understanding of the written instructions. While the teacher structured the activity, the students had to perform it independently.

		RESOURCE: The *Casio OH-260 Overhead* can be used directly on an overhead projector to help learners follow along and practice as you demonstrate the calculator skills required on the 2002 GED. Also, Steck-Vaughn 2002 *GED Skill Book for Mathematics: The Calculator* can be used for additional practice. These can be found at http://www.steck-vaughn.com/ Follow calculator-use instruction with a discussion about how easy or difficult the instructions were to read and follow. Discuss how useful examples were that accompanied the written instructions. Talk about the strategies they used in reading the instructions, ways that they monitored their comprehension and what they already knew about calculators and math that helped their understanding. Gather information of student's knowledge about calculators, fractions, and what operations they would like to be able to perform on the calculator. Step 3 – With reference to the answers from the discussion in Step 1, have students talk about if and how their answers might change now that they have read a set of written instructions. Students could also talk about which strategies they used in reading the instructions. Students might mention the following: Sequencing, Pictorial aids, Self-questioning, Use what you already know. To reinforce their understanding of the written instructions, have students write the instructions in their own words. Step 4 – Have students work in small groups to create some fraction addition and subtraction problems. A prompt for this might be some recipes with fractional measurements. Before beginning the activity, the class can discuss what evidence would be needed to demonstrate they had read with understanding during the activity. The students might decide on a certain number of problems they would need to get correct in order to say they had read the instructions with understanding. Students then solve the fraction addition and subtraction problems they have created. Students could check their work by working each problem twice to see if they get the same answer both times. Students could also do half of the problems "by hand" and half with the calculator to see which way is more efficient. **CLASSROOM RESOURCE:** Lesson 3 and Practice 3 are specific to Fractions and could be used in the development of this lesson http://www.mvaea.com/casio.html; as well as additional practice at http://www.ket.org/GED2002	

REFLECTION/EVALUATION *The activity occurred over a 4-day period and involved following simple, teacher generated instructions that were listed in sequential order. Students needed to demonstrate they could read, follow, and implement the steps to do calculations involving fractions. It was helpful to keep in mind the students' desire to learn this information while making sure the activity met the standard. The more student-driven (real world), the easier it seems to be able to find the components in the activity. Since learning to focus on all the components of a standard in designing an activity, I find that I teach more about strategies than I ever have. I try to raise awareness about how individuals think instead of just drilling the information. I try to implement discovery learning. Students are able to verbalize processes they use for coming up with answers. They seem to be thinking about how they do something instead of just asking if they did it right or wrong.* NEXT STEPS	PURPOSEFUL & TRANSPARENT Students clearly understood the purpose for the activity; in fact, they had stated that understanding the calculator was important to achieving their goal of passing the GED tests. The teacher and students were clear about which standard was to be the focus of the activity and together they discussed what was required to perform the standard. CONTEXTUAL This activity was constructed to reflect a real-life situation for the learners, one that they articulated themselves. Students could see how being able to perform this activity would help them in other areas of their lives and they shared examples of how not being able to perform the activity could adversely affect them. BUILDING EXPERTISE Students discussed what they already knew related to the activity: reading with understanding, using a calculator, performing operations using fractions. The teacher provided pre-activities to ensure that students had multiple opportunities to reflect on what they knew and what they were learning. The teacher allowed the students to determine their evidence of learning for each of the activities.

FOLLOWING DIRECTIONS

Handout 1

Materials: You may need: a sheet of paper, a pencil, and markers.

Follow these directions:

1. Read through all the problems before beginning any of the work.
2. Give the answer for the following problem: 1 x 2 x 3 x 4 x 5 x 6 x 7 x 8 x 9 =
3. Find three whole numbers which, when multiplied together, give the same result as when added together.
4. A plain pencil and a colored pencil together cost 30 cents. The colored pencil costs 10 cents more than the plain pencil. How much does each cost?
5. Give two numbers which when added together produce the same answer as when they are multiplied together.
6. A boy sold his bicycle for $30. He later bought it back again for $25. The next time he sold it for $40. How much did he make overall?
7. Using five 1's it is possible to make them equal 100 by arranging them as: 111 - 11 = 100 Use five 5's to make a 100.
8. It is possible to write down the digits 1 to 9 (writing each once and once only, and in order) and then place ordinary arithmetical signs as necessary so that the answer to the entire sum is 100. For example: 1 x 2 + 34 + 56 + 7 - 8 + 9 = 100 Find a way that uses only + and - signs for addition and subtraction.
9. All of the odd numbers from 1 to 999 are added together. What is the total?
10. I am thinking of a 2-digit number which - When it is divided by 3 the remainder is 1. When it is divided by 4 the remainder is 2. When it is divided by 5 the remainder is 3. When it is divided by 6 the remainder is 4. What number am I thinking of?
11. You do not need to do any of the problems above, just write your name in the upper right-hand corner of this paper and place it on my desk

FOLLOWING DIRECTIONS

Handout 2

Materials: You may need: a sheet of paper, a pencil, and markers.

Follow these directions:

1. Read all directions before beginning.
2. Take out one sheet of lined paper.
3. Place it on your desk so that the holes are on the left side and the margin is at the top.
4. Skipping lines, number your paper 1-7
5. On the first line, write your name.
6. On the second line, write the name of the person sitting across from you.
7. On the sixth line, draw three stars using a blue marker.
8. In the center of the paper, about 5 lines below line seven, draw a box.
9. Write the number of siblings you have to the right of the box.
10. Divide the box into four equal parts with a purple marker
11. Color the top right hand section of the box orange.
12. Draw a flower in the bottom left hand corner of the box.
13. Color the center of the flower red.
14. Turn your paper upside down.
15. Write out today's date using all capital letters.
16. Turn your paper right side up again.
17. On line three, draw a small picture of your favorite food.
18. Draw a circle around it.
19. Write the name of your first pet on line four.
20. Draw a star in each corner of your paper, using four different colors.
21. Underline two of the stars.
22. Turn your paper over.
23. Fold it in half lengthwise.
24. Fold it in half the other way.
25. Write your middle name on the outside.
26. Ignore directions one through twenty-five and enjoy watching everyone else do this activity wrong.