Evaluating Efficiency

Cross-Curricular Focus: Mathematics

There are many ways to solve the same math problem. The method you choose depends on how well you know math. How comfortable are you with using addition, subtraction, multiplication and division? Can you apply math properties easily? There may be only one correct answer to a problem, but many different ways to solve it.

Any method that works for a student is a good method. You can use repeated addition if you don't remember the multiplication facts. You will still reach the correct answer. Sometimes students rely on one way because it is the only way they have ever seen. They don't consider that there may be a different way to do the same problem.

The way most people in the same culture solve a certain problem is called the standard algorithm for that kind of problem. However, the standard algorithm for the same kind of problem is often different from one culture to the next.

A math congress or math meeting can be very valuable for students. In the meeting, students share how they solved a math problem. The rest of the class watches and listens. Students share every method that someone used to solve the problem. All the methods are discussed. There are a couple of reasons why this kind of meeting is beneficial. First, each student's thinking is presented and honored. Second, students learn to talk about and explain their thinking processes. Third, students are introduced to new ways of solving problems. The teacher can even learn new ways from the students. Finally, students can evaluate the methods to see which method is the most efficient.

An **inefficient** method may give the correct answer. If it takes too long to get there, though, it is not practical to use. It can also be inefficient if it leads to an **inaccurate** answer. An efficient method is one where a students gets a correct answer with the least amount of effort. The method has to be repeatable with the numbers of any similar problem. The student also needs to understand why the method works.

Learning to evaluate different methods of solving math problems is important. It is one of many steps you must take in order to mature as a mathematician.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) Have you ever considered trying to solve a math problem in more than one way? Why, or why not?

_____

_____

2) Have you ever thought you were "doing it wrong" because you were doing something different than other students, but then you got the correct answer? Explain.

_____

_____

3) Would you be willing to share an unusual method of solving a problem if you were given the opportunity? Why, or why not? _____

_____

_____

4) What makes a method of solving a problem inefficient?

_____

_____

5) How do you know if a method is efficient?

_____

_____

_____

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Name: Key

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

Actual wording of answers may vary.

1) Have you ever considered trying to solve a math problem in more than one way? Why, or why not?

student's choice

2) Have you ever thought you were "doing it wrong" because you were doing something different than other students, but then you got the correct answer? Explain.

student's choice

3) Would you be willing to share an unusual method of solving a problem if you were given the opportunity? Why, or why not? student's choice

4) What makes a method of solving a problem inefficient?

if you get the wrong answer or if you get a correct answer but it takes too long to get there

5) How do you know if a method is efficient?

if you get a correct answer with the least amount of work, it is repeatable and the student understands why it worked