

Math Journals/Math Book

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This practice is used in an outcome-based setting to help students measure their own progress in math.

At the end of each class period, students write journal entries about the outcome addressed that day.

Outcomes to be met in the course are as follows:

- Awareness of the connection of math to everyday life.
- Understanding the relationships of fractions, decimals and percents.
- Applying computational skills related to fractions, decimals, percents and ratio in problem-solving contexts.
- Demonstrate the ability to communicate mathematically both orally and in writing.
- Expressing confidence in one's ability to think and reason mathematically.

Each learner writes about how he or she has grown towards the outcomes, and provides examples with explanations of skills that were work on that day. Upon completing the outcome journals for fractions, each learner then uses these journals to crease a Fraction Math Book.

The Fractions Math Book must demonstrate the learner's skill and understanding of the following:

- Types of fractions
- Reducing fractions
- Writing fractions in higher terms
- Changing an improper fraction to a mixed number
- Changing a mixed number to an improper fraction
- Finding common denominators
- Comparing the size of fractions
- Addition
- Subtraction
- Multiplication
- Division

Student example: Changing Mixed Numbers to Improper Fractions

When changing mixed numbers to improper fractions, you must multiply the denominator by the whole number and then add the numerator to the total of the whole number and denominator.

Example: $4 \frac{3}{15} = \frac{63}{15}$

First, you must multiply the 4 and 15 together. This gives you 60. Then you take the 60 and add the numerator to it (in this case it's 3). So you have $4 * 15 = 60 + 3 = 63$. The 63 becomes the new numerator, but your denominator stays the same, giving you $\frac{63}{15}$

In the next course, learners will again write daily journals to be used in a Decimal Math Book. The Decimal Math Book must demonstrate skill and understanding of the following:

- Place value
- Reading and writing decimals
- Comparing size of decimals
- Rounding decimals
- Addition
- Subtraction
- Multiplication
- Division

Learners are required to include many examples using both numbers and words in their books. An incentive for creating detailed examples is that learners are allowed to use their books when taking tests. The math books can be done as creatively as a learner wants using markers or colored pencils. Some learners create their math books on the computer.

This practice addresses the standard set by the National Council of Teachers of Mathematics that requires learners to communicate mathematics effectively. The math books allow learners to show some creativity and individuality in a mathematical system that sometimes seems like a system of all rules. The journals allow the learners to practice writing about mathematics daily, making it easier to write the math books.