

Writing in the Mathematics Classroom

Upon first glance, writing and mathematics may seem like oil and water: they don't mix. As the table below shows, the two content areas often appear to be polar opposites of each other.

Mathematics	Writing
numbers	words
requires precision	requires creativity
right or wrong	open to interpretation
favors the concise	favors elaboration

However, writing in the mathematics classroom is more natural than it seems, and has many benefits for students.

How the Mathematics Student Benefits

As students write about their work in mathematics, they think deeply about procedures rather than focusing on rote performance. They learn and practice using precise mathematical vocabulary. They combine creativity with logic. When students write about their own work, it encourages them to reflect on their processes. This thinking highlights areas of improvement, such as inefficiencies or errors, and strengths, such as creative solutions and conceptual understanding.

How the Writing Student Benefits

Writing in the mathematics classroom also strengthens students' writing. Mathematics tends to be procedural, which provides a natural structure for students to practice organizational skills. Mathematics is a familiar topic about which all students can write. Also, when students write about their own processes, they can look back at their work as concrete examples, a practice similar to looking back at a reading passage to provide textual evidence.

Writing in Mathematics
deepens conceptual understanding
encourages the use of precise language
bridges logic and creativity
develops organization

Incorporating Writing in the Mathematics Classroom

Writing in the mathematics classroom is not only beneficial but also simple. Here are some writing activities for students to try:

Explain a procedure or problem-solving process – Ask students to explain in detail a procedure or problem-solving process. Consider having students direct their writing to an audience, such as a younger sibling or friend, so that the explanation is thorough, clear, and complete. Examples:

Multi-Step Word Problem		
The fourth-grade students at Oak Elementary are planning a picnic.		
<ul style="list-style-type: none"> • There are 5 fourth-grade classes. • Each class has 25 students and 1 teacher. • 30 parents signed up to attend the picnic. • Each student, teacher, and parent will be given 1 hot dog. • Hot dogs are sold in packages of 8. 		
What is the fewest number of packages of hot dogs needed for the picnic? Explain the process you used to find this number.		

Exercise Survey		
Design and conduct a survey about the exercise habits of the students in your class. Create a chart or graph to display your data. Then, write about your survey. Topics may include:		
<ul style="list-style-type: none"> • Why the question you selected is a statistical question • The steps you took to conduct the survey • The steps you took to create the data display • Analysis of the data • Potential implications of the results of the data 		

Area of a Right Triangle		
Triangle ABC is shown. Tanya needs to find the area of triangle ABC, but has not been taught how to do this yet.		
Write a letter to Tanya explaining how to find the area of triangle ABC.		

Explain errors in sample work – Provide students with sample work which contains at least one error. Ask students to describe the error in addition to explaining the changes required to correct the work. Examples:

Multiplication with an Area Model										
Amir used an area model to find the value of 23×54 . His work is shown.	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center;">20</td> <td style="padding: 5px; text-align: center;">3</td> </tr> <tr> <td style="padding: 5px; text-align: center;">50</td> <td style="padding: 5px; text-align: center;">100</td> <td style="padding: 5px; text-align: center;">150</td> </tr> <tr> <td style="padding: 5px; text-align: center;">4</td> <td style="padding: 5px; text-align: center;">80</td> <td style="padding: 5px; text-align: center;">12</td> </tr> </table>		20	3	50	100	150	4	80	12
	20	3								
50	100	150								
4	80	12								
Write a letter to Amir explaining what mistake(s) he made, and what he should have done differently to find the correct value.	$100 + 150 + 12 = 262$ $23 \times 54 = 262$									

Box Plot	
Kim asked 32 people how many miles they walked over the weekend for an exercise program.	
<ul style="list-style-type: none"> • Approximately 25% of the people walked fewer than 6 miles. • The greatest distance walked was 12 miles. • Approximately 50% of the people walked between 6 and 10 miles. 	
Kim made the box plot below to represent the data.	
Using the given information, is Kim's box plot correct?	
If not, explain what mistake(s) she made and what she should have done differently.	
If so, explain at least two more conclusions you can draw about Kim's data.	

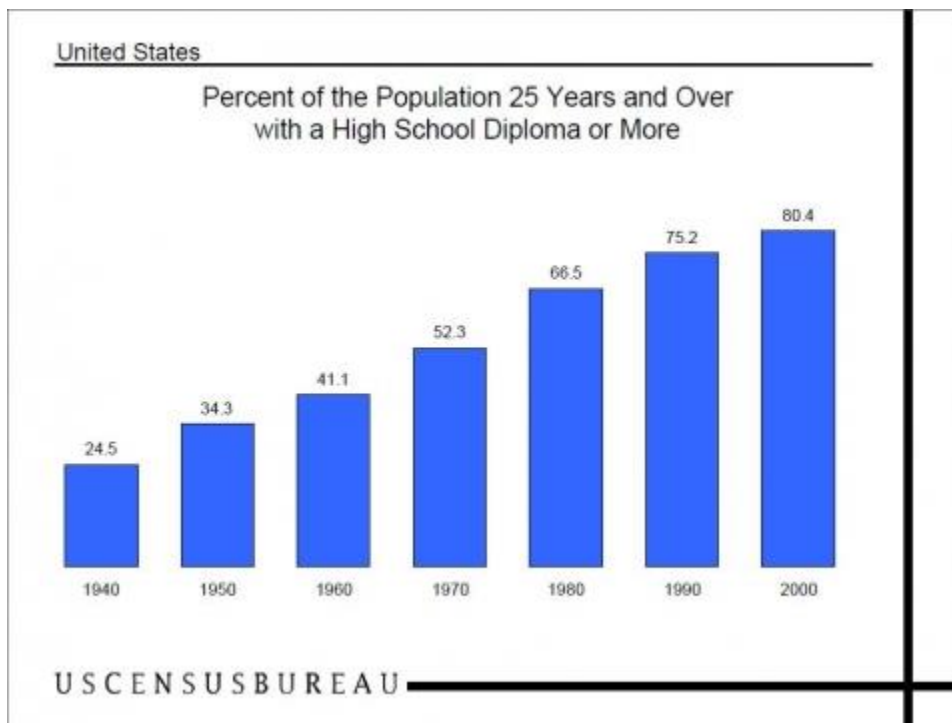
Write a biography – Ask students to write a biography about a famous mathematician. Examples:

- Pythagoras
- Euclid
- Leonardo of Pisa (Fibonacci)
- Rene Descartes
- Blaise Pascal
- M.C. Escher
- Eratosthenes

Write a creative piece – Read aloud a math-related picture book. Then ask students to respond to the story or write their own math-related poetry or story. Examples of books to read:

- *The Grapes of Math* by Greg Tang
- *How Much is a Million?* by David M. Schwartz
- *A Remainder of One* by Elinor Pinczes
- *Math Curse* by John Scieszka and Lane Smith
- *The Greedy Triangle* by Marilyn Burns
- *The Librarian who Measured the Earth* by Kathryn Lasky
- The *Sir Cumference* books by Cindy Neuschwander and Wayne Geehan

Write an article – Show students a graph or chart from a news article without the text of the article attached. Ask students to write an article that the chart or graph would support. Example:



Respond to journal prompts – Include math prompts for students' journal writing. Examples:

- What mathematical skill or topic is most difficult for you, and why? What can you do to improve this skill?
- Describe a real-life scenario in which you would use estimation.
- Math is a part of many activities such as music, art, and sports. Choose an activity and describe what part math plays in that activity.
- Imagine a world where numbers do not exist. What would be the advantages and disadvantages of a lack of numbers?

- You are buying a shirt that is on sale for 25% off the original price. You also need to pay 6.5% sales tax. Explain how to find the total amount of money you need to buy the shirt.
- William says to you, “Why do we have to learn math? I haven’t used math in the last three weeks!” Answer William’s question, including specific ways he might have used math in the last three weeks.

With a little bit of effort and creativity, writing can become a natural and beneficial part of the mathematics classroom.