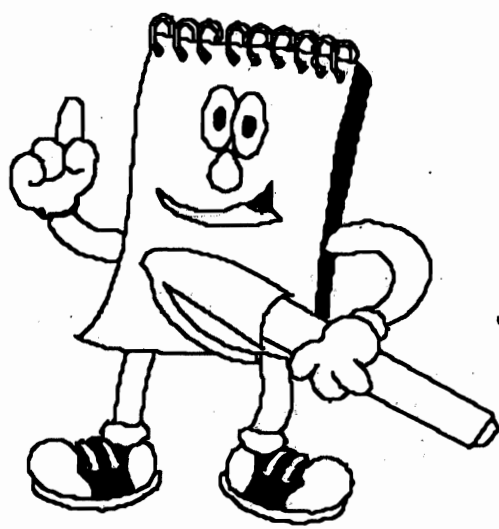


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2
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10 5 54

26

Journal Writing In Math Class K - 8



Compiled by Frontier Math Consultants
Frontier School Division

Journal Writing

It is not possible to hear everyone's ideas everyday in a class. Journals help teachers assess the thinking of students. Journal writing can develop and enhance thinking and communication skills in mathematics.

Journal writing represents an opportunity for students to produce pictures and written expressions of thoughts and feelings, to ask questions and to comment on their learning experiences. If journal writing is done on a regular basis, it will help promote mathematical understanding.



Math journals are a means of providing a record of the students' own involvement with the learning experience. Incorporating writing into math class encourages students to think about math and reflect on what they are learning. Whether you call their writing "journals" or "learning logs" is not significant. **It is more important just to encourage your students to write and communicate about math.**

Rather than copying from the board or math dictionary, make the writing personal. The writing should be in the students' own words using the appropriate math vocabulary. As students explain their thinking, teachers will gain insight into how each student is understanding and using mathematics.

The Purpose of Journal Writing

- ✓ To increase the students' awareness of how they learn and remember.
- ✓ To provide a record of students' thinking.
- ✓ To provide a vehicle for writing about thinking as a way of learning.
- ✓ To provide a context for recalling previous learning and summarizing present learning.
- ✓ To provide an ongoing record of challenges the students are encountering during learning which may help to direct future instruction.



Therefore, journals are valuable as assessment tools. They are also starting points for conferences and observations.

The Path To Successful Journal Writing

1. Regularly engage students to communicate about math. Provide many opportunities for "math talk".
2. Create an atmosphere in which all students can succeed in math. Create math word walls that students can reference for math vocabulary. Have manipulatives ready for those students who need them.
3. Set clear expectations for your students and make your class well aware of them.
4. Model the writing process many times for students.
5. Deliver quality lesson plans that promote thinking.
6. Provide a clear, well-defined purpose for writing for each entry.
7. Provide a format for students.
8. Use writing prompts to start off the writing.
9. Share and spotlight a good journal entry to the class to motivate students to write more detailed entries.
10. Allow for a variation of responses. Students can write or draw to explain their thinking. Take dictation if necessary.
11. Setting up a comfortable setting for your class will take a long time. Success will not come overnight or over a few days. Persistence and patience will pay off.



A Suggested Procedure

Here is a suggested plan you could follow for setting up journal writing in your class.

I - Regularly engage students in discussion about what they are learning, why they are learning, the challenges they are encountering, and the attempts they are making to problem solve. These discussions provide students with the language they require to talk or write effectively about their learning and problem-solving processes. Before the students write, many opportunities to talk math should be provided. Journal writing must be modeled before students are expected to do it themselves.

Students can have trouble translating what they say and think into written form. Students who struggle in writing need to verbally communicate about math first. One way to get better written results from students is to have the class brainstorm for ideas and record them on the board. Most importantly, students should always have a clear, well-defined

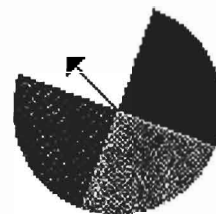
purpose for writing in their journals. They need to know exactly what they are writing about and who the audience is.

2 - Immediately after class discussions have students write and illustrate their thinking. Have them write it just as they say it. Journal entries should be written in the students' own words. The writing should be a reflection of the students' own thoughts. Use frame sentences to help and encourage journal writing.



Example:

I think that the spinner will have a one out of four chance to land on red because one-quarter of the spinner is red. If the spinner was half red it would have a fifty-fifty chance of landing on red.



3 – Respond back to the writing. Respond to students' writing with questions or comments that will extend their thinking. Allow students to flag entries for you to make sure you respond. Responding to journal writing will have students valuing their purpose.

Writing Tips For Students

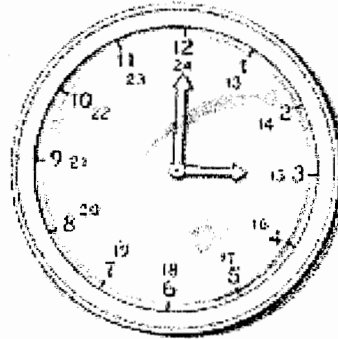
- Have a class conversation about the topic.
- Record student ideas on the board.
- Create a concept map or web of connected ideas.
- For “stuck” children:
 - Ask them, “*Why do you think this is the answer?*” or “*How do you do this?*” or “*Tell me about your drawing.*”
 - Tell the students to write what they just said or write as they were talking to you.



Note: Students may have some difficulties writing in their journals initially but improvement will come over time and with effort. Teachers need to model the math journal writing process with the class. Teacher encouragement and feedback is also necessary for growth. **Be patient!**

Time

It is suggested that journal writing can be done once a week or at least once every two weeks. However, seize each opportunity that will provide good journal entries that exhibit student learning.

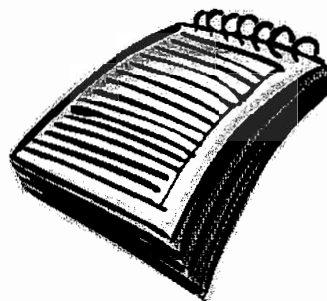


Organization of Math Journals

There are many ways to organize math journals and math writing. Choose a format that works well for you and your students. Provide a recording sheet or writing space that allows students enough room to write and/or draw their entry but not too big to overwhelm students.

The journal entries can be recorded in:

- regular scribbler (It can also be cut in half.)
- steno pad
- stapled booklets
- spiral bound/graph paper. You may divide this into sections for each strand of the curriculum.
- sections in the binder. Provide students with a variety of paper such as lined paper, blank paper, squared paper, dot paper, 0 - 99 or 1 - 100 charts.



Possible Formats For Introducing Journals

Math Journal

Date: _____

Today I did _____

Today I learned _____

Use pictures, numbers or words.

Math Journal

Date: _____

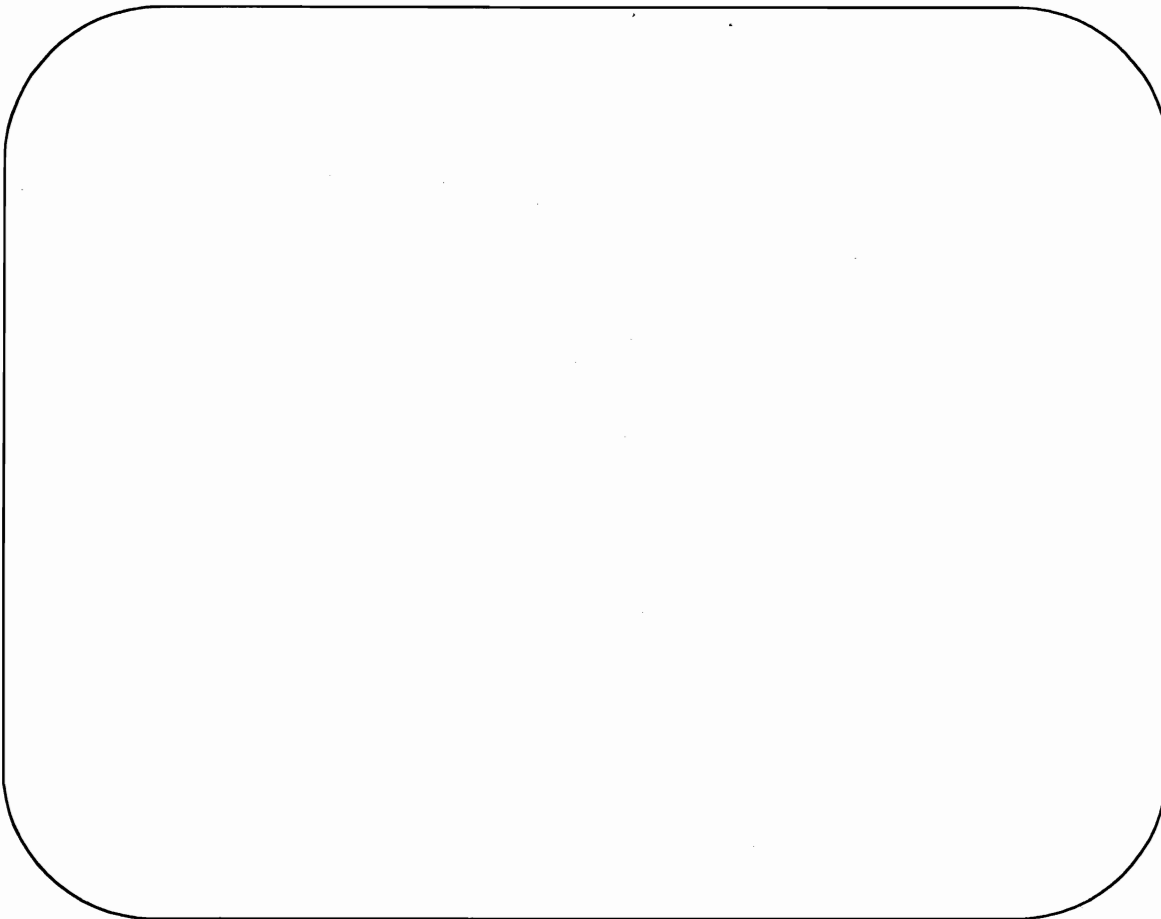
1. What I am still not sure about is

2. What I would like to know more about is

Use pictures, numbers or words.

Journal Entry

Name: _____ Date: _____

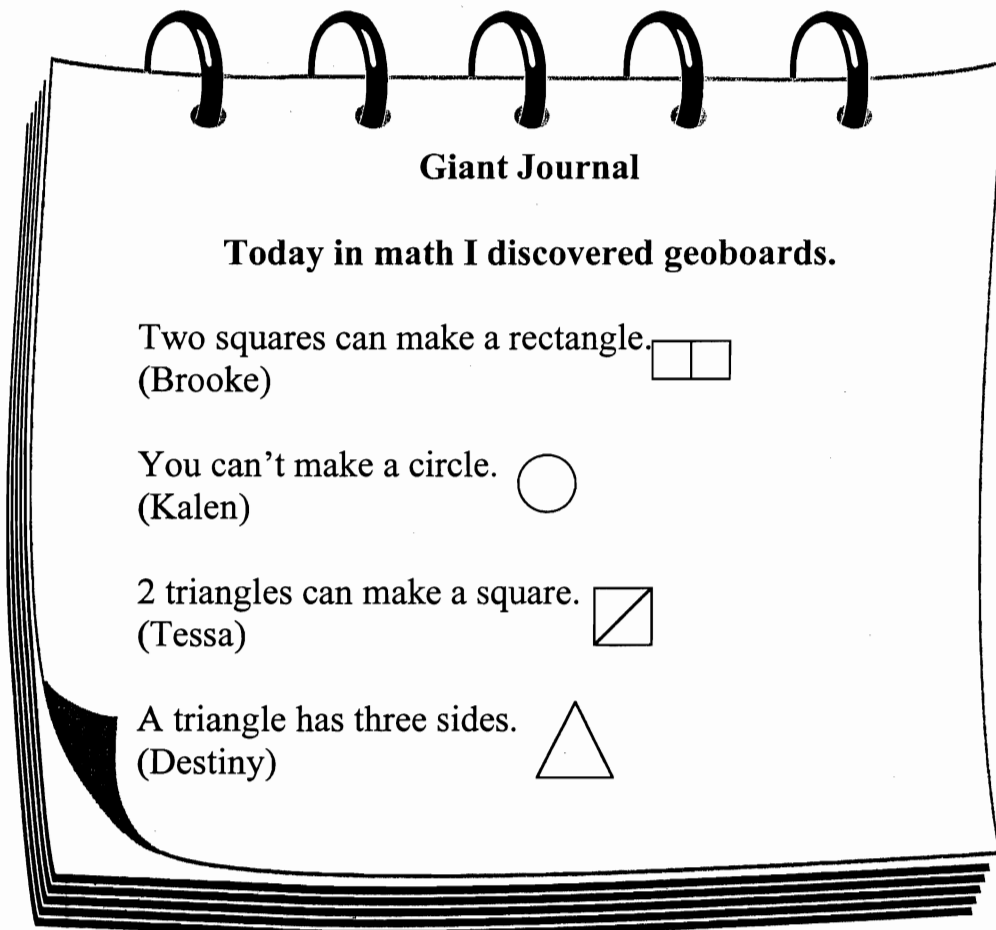


Strategies For Early Writers

It is difficult for pre-writers and beginning writers to express ideas by writing. Here are some techniques for journals in Kindergarten and first grade that can lead to successful journal writing in math class.

- The writing can be done through a language experience approach. The Giant Journal can be used as an interactive approach. Use a large flip chart to record responses that children make to an activity noting the child's name.

Example:



- Allow the children to communicate through drawings and pictures and any writing they are capable of. For a young child, invented spelling should not be a concern.
- Brainstorming – Help the children translate their ideas into written form by brainstorming. Do this on a class or individual basis.
- Use a journal question and interview a child.

Evaluating Students' Responses

Students tend to give writing more thought if it is to be scored. With math journals, it is more important to score the responses on content rather than on grammar and spelling. We have included three rubric scales taken from the resource "The Write Way Mathematics Journal Prompts" by Barbara J. Dougherty.

There are many ways to create a rubric. Teachers alone can develop their own or students can work with the teacher to develop a rubric specific to their class. Although grammar and punctuation are not usually scored, students should communicate their ideas in ways that are understandable. Some students may use drawings, charts, tables, or other means to convey their ideas. Encourage them to use whatever way they need to make their ideas clear.

To improve students' responses, take excerpts from students' papers to illustrate qualities that you consider important. Put responses on overhead transparencies or photocopy them for all students to see. Keep the responses anonymous.

Rubric Sample 1 - A four point scale

4 points	The student's work includes: <ul style="list-style-type: none">• a completed prompt or an answer to the question posed.• support for statements made by using either examples or counterexamples.• ideas clearly communicated to the reader.• legible writing, drawings, pictures, charts or tables, and diagrams.• accurate mathematics or information.
3 points	Omission of one criterion from level 4.
2 points	Omission of two criteria from level 4.
1 point	Omission of three criteria from level 4.
0 points	Omission of more than three criteria from level 4.

Rubric Sample 2 - A five level scale:

- 4 points The student's work shows a response that:
- addresses the question raised in the prompt.
 - has correct or accurate mathematics.
 - is legible.
 - has support or justification for any statements made.
 - makes sense to the reader
- 3 points The student's work shows a response that:
- addresses the question raised in the prompt.
 - has correct or accurate mathematics.
 - is legible.
 - does not have fully justified or supported statements.
 - makes sense to the reader.
- 2 points The student's work shows a response that:
- addresses the question raised in the prompt.
 - has some incorrect or inaccurate mathematics.
 - is legible.
 - does not have justified or supported statements.
 - Is somewhat clear to the reader.
- 1 point The student's work shows a response that:
- addresses the question raised in the prompt.
 - has incorrect or inaccurate mathematics.
 - is partially legible.
 - does not have justified or supported statements.
 - does not make sense to the reader.
- 0 points The student's work shows a response that:
- does not address the question raised in the prompt.
 - has incorrect or inaccurate mathematics.
 - is not legible.
 - does not make sense to the reader.

Rubric Sample 3 - A three point scale

Exceeds Standard The student's work shows a response that:

- addresses the question raised in the prompt.
- has correct or accurate mathematics.
- is legible.
- has support or justification for any statements made.
- makes sense to the reader.

Meets Standard The student's work shows a response that:

- addresses the question raised in the prompt.
- has some correct or accurate mathematics.
- is legible.
- does not support or justify some of the statements made.
- makes sense to the reader

Below Standard The student's work shows a response that:

- does not address the question raised in the prompt.
- has incorrect or inaccurate mathematics.
- is not legible.
- does not support or justify statements made.

Rubric Sample 4 - A five point scale

This sample is taken from a classroom in our division where the teacher and students made up the rubric.

1 mark	Title and Date of entry
1 mark	For all requirements
1 mark	Demonstrates content knowledge
1 mark	Grammar and Spelling
1 mark	Neatness and organization



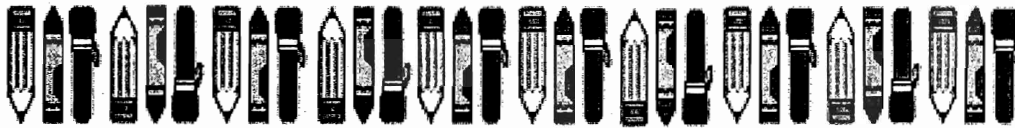
General Writing Prompts and Questions:

The following are writing prompts to help students communicate their thinking. Make sure your students have a clear purpose for what they are writing about. Here are some suggestions to get you started. For example, if you want to find out what they learned about a particular lesson, have them start off by writing, "Something I learned today about ___".

- Something I learned today...
- Something I did well...
- Something easy...
- Something hard...
- Something I didn't understand...
- Something I did to help...
- I wish I...
- I found the right tool to...
- I saw a pattern...
- I predicted...
- I estimated...
- I organized...
- I graphed...
- I explored...
- I made...
- I found...
- I explained...
- I completed...
- I made a connection...
- I cooperated...
- I thought of a new strategy...
- When I find an answer I feel...
- My plan for tomorrow is...
- Something I learned recently in math...
- Math is easy when...
- Math is hard when...
- I wish my teacher would...
- I wish my teacher wouldn't...
- Something in math I don't understand...
- Something in math I'd like to learn...
- I feel best about math when...
- Skill(s) that I enjoyed learning...



- Skills(s) that I have to work harder to learn...
- Something I want to learn tomorrow is ...
- Something I know now that I did not know yesterday is ...
- Something that I am confused about is ...
- How could I try to find the answer to ...
- Talk to your stuffed bear and tell it how you feel about math today: relate object to your theme, e.g. write to your favorite dinosaur
- This situation reminded me of: a movie you saw, a book you read, or about your life at home or in the community



The prompts can also be reworded as questions. E.g., Something I learned today... What did you learn about _____?

What did you do today, what did you learn, and how did you feel about it?

If you were to give advice or directions to someone new to this activity, what helpful hints would you offer?

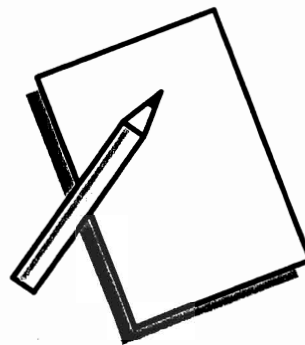
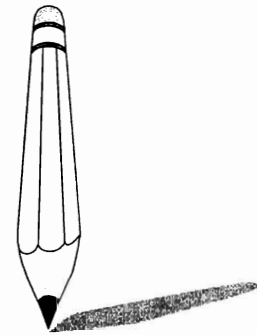
What did you find most difficult about what you did today and why was it so difficult? What was easiest for you and why?

What sensations were you aware of (e.g. sounds, colors, textures, temperature, materials)? When have you noticed similar situations and under what circumstances?

If you could make a video of today's lesson:

- What close-ups would you like to see?
- What parts would you spend the most time shooting?
- What would you edit out?

What experiences have you had before that reminded you of what you did today and why did you make those connections?



What did you enjoy today and why did you enjoy it so much? What did you enjoy least and why?

When would you use this kind of experience in your own life, how would you use it and what use would it be?

If you could take one photograph of today's activity, what would it be? Draw a picture of the photograph.

Specific Journal Questions

Students must always have a clear, well-defined purpose for writing in their journals. Remember to let the students know what to write about and who the audience is. They should also be given a reasonable time frame within which to complete the journal entries. Journal writing promotes reflection of math learning, a crucial metacognitive skill. It is therefore important for students to be given opportunities to talk about and share journal entries with the not only the teacher but their classmates.

On the following pages, there is a list of specific journal questions for grades 1 - 8. While the questions in this booklet are focused on the number strand of our math curriculum, **writing needs to be done in every strand.**

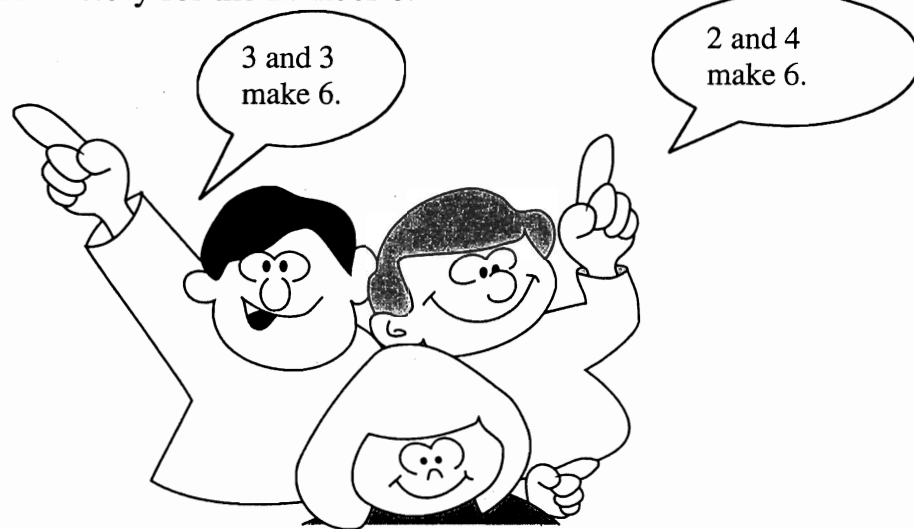
The list is not extensive. Many of questions can be adapted for use in any grade level. The questions have been taken and adapted from the Manitoba Mathematics Curriculum and The "Write" Way Mathematics Journal Prompts.



Use the questions and prompts for individual students or in a problem-solving context where students create a solution in a group. If groups work on the problem, they can share their ideas before the whole class. This can allow for more communication about math in your class.

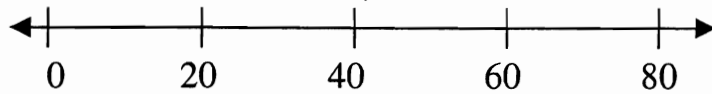
Grade 1

1. Explain how you count by 2s. Use pictures to show how.
2. Start counting at 5. Show how far you can count by recording the numbers in your journal.
3. Show me a subtraction story for the number 5.
4. Show me an addition story for the number 6.



5. Draw and tell a story to match this number sentence: $7 + \underline{\quad} = 10$.
6. A student thinks that $5 + 1 = 7$. Use numbers, words or pictures to show if you think this is correct.
7. A new student has come to our classroom. Explain subtraction to him by drawing and writing. Explain to him when we would use it in our classroom.
8. There were 8 birds in the backyard on Monday. On Tuesday, there were only 5 birds. Explain in a picture or words how many birds are left.
9. How would I count a large set of pennies? Explain an organized way to count them.
10. If I had a collection of marbles that I don't want to count 1-by-1, how can I organize them to make it easy to count?

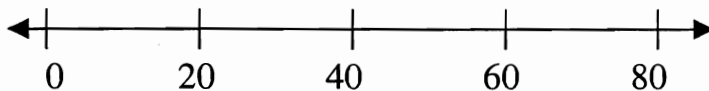
11. Tom found a number line. He wanted to put 46 on the number line. Show where you think it belongs and tell why you put it there.



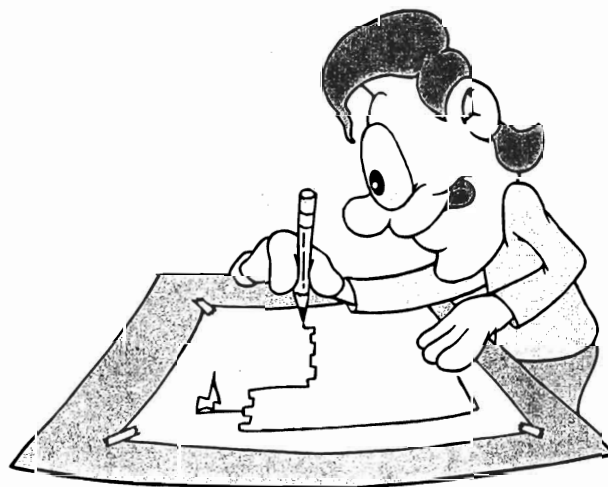
12. Your teacher won 850 jelly beans. Can she hold all of them in her hand? Why?
13. Jim wrote $5 + 4 = 9$ on the board. What does "=" mean?
14. Jack said, "I was sixth in line and I was also last in line." Can this be true? Why or why not?
15. Draw a picture that shows you are the seventh person in line.
16. Pam has seven coins that equal 25¢. What could the coins be?
17. Jordan was eating a jelly sandwich while she did her homework. She dripped some jelly on her paper. What could go under the blob of jelly?

$$4 + 6 + 1 + 3 = 10$$

15. Show 2 ways to prove that 21 is an odd number.
16. "A space alien has landed in your classroom. You are in the middle of doing the addition problem, $49 + 26$. The alien does not understand what you are doing and it wants to learn. You are the only one there to teach it. Write about what you will tell the alien to explain what you are doing."
17. Write a subtraction story. Solve it in as many ways as you can. Tell your story to a friend and compare strategies after it has been solved.
18. How many different ways can you show 23?
19. What are doubles? Why are doubles important to know?
20. How can addition help you do subtraction facts like $12 - 4$ and $15 - 6$?
21. Pat found a number line. He wanted to put 76 on the number line. Show where you think it belongs and tell why you put it there.



22. Your teacher won 850 jelly beans. Can she hold all of them in her hand? Why?
23. Jim wrote $5 + 4 = 9$ on the board. What does "=" mean?
24. Jack said, "I was sixteenth in line and was also last in line." Can this be true? Why or why not?



25. Draw a picture that shows you are the seventeenth person in line.
26. Pam has seven coins that equal 25¢. What could the coins be?

Grade 3

1. We use these signs in math class. Show the correct meaning of each by using pictures, numbers or writing words.

<

=

+

2. Is $9 - 5$ the same as $5 - 9$? Draw a picture to explain your answer.
3. Explain what you are thinking when solving this question, $7 + 9 = \underline{\hspace{2cm}}$
What mental math/thinking strategy did you use?
4. a) How many different ways can you show 21?
b) Do you think there would be more or fewer ways to show 29 than there are to show 21? Explain.
5. a) Does $16 + 9$ have the same value as $9 + 16$?
b) Does $16 + 9 + 5$ have the same value as $9 + 16 + 5$? Show how you know.
6. a) Which is greater 200 ones or 20 tens? Explain.
b) Which has a greater value: 1 hundreds block or 12 tens blocks? Show how you know.
7. a) Is $13 + 11$ an odd or even answer? Show how you know.
b) Is this statement true or false? Show how you know.
Odd number + even number = even number
8. Explain how you know that a number is divisible by 5.
9. a) Show how you will divide a cake equally for 5 people.
b) What is the fraction name for each piece?
10. How do you compare large numbers?
11. Show 2 ways to add 57 and 28.
12. When do you need to use division?

13. Show how you know that $4 \times 7 = 7 \times 4$.

14. Bob did all these questions incorrectly. Explain his mistake for each question.

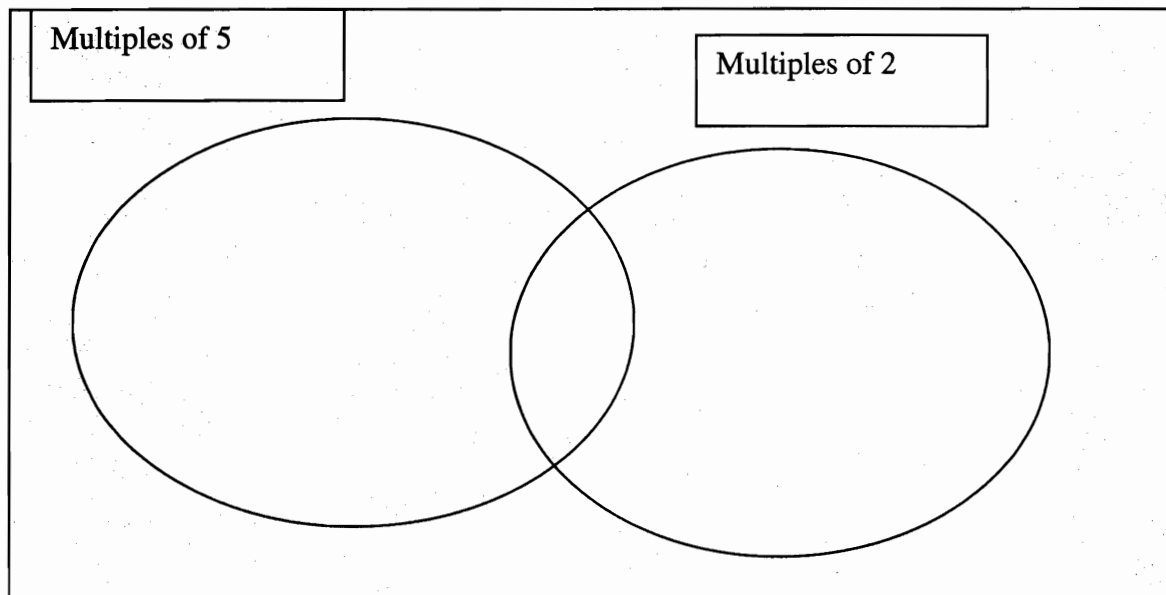
a) 26 b) 20 c) 40 d) 40

$$\begin{array}{r} -8 \\ 22 \end{array} \quad \begin{array}{r} -4 \\ 20 \end{array} \quad \begin{array}{r} -6 \\ 20 \end{array} \quad \begin{array}{r} -37 \\ 13 \end{array}$$

15. Use the Venn diagram to sort the following numbers:

136 19 620
58 75 455
801 573 350 235

Explain why some numbers are in the intersection.

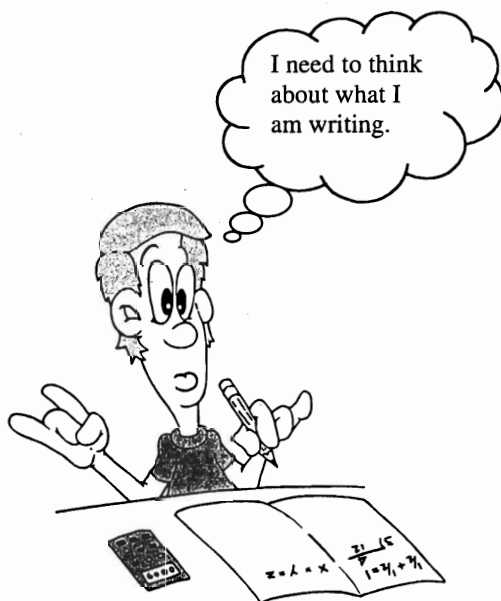


16. Steve was given a choice of one-fifth or one-tenth of a long piece of candy bar. He was hungry so he chose one-tenth. Did he make a wise choice? Explain.

17. a) Explain the strategy you would use to calculate $37 + 65$ mentally.
b) Is there another strategy you can use?
c) Why do you prefer the strategy you chose?

18. Create one word problem using both addition and subtraction in the problem. The answer in the problem should equal 69.

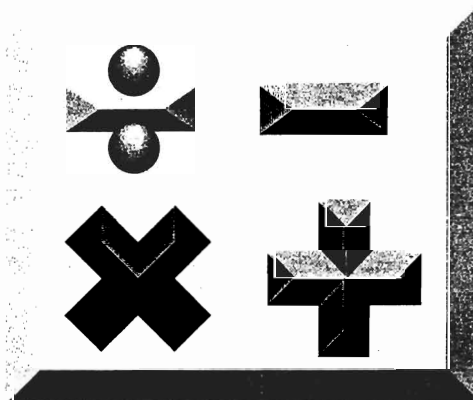
19. Create a routine word problem using base 10 blocks. The problem must show either addition or subtraction.
20. Ken rounded a number to 600. Find a number that Ken could have used. Explain why it can be rounded to 600. Find another number that can be rounded to 600.
21. Explain what a number line can be used to do.
22. Write a letter to a friend about the largest number you have ever used. Describe how you used the number.
23. The principal asked your teacher why we need numbers larger than 10,000. What do you think your teacher told the principal.
24. What is your favourite fraction? Tell what your fraction is and tell it in a problem or a short story.
25. Write a problem that can be solved by $35 \div 5 = 7$.
26. Dan's calculator is broken. It doesn't always add correctly. He added $57 + 25$. His calculator showed the sum of 81. Did his calculator show the correct sum? Why or why not?



Grade 4

1. How can number operations help you when you are shopping?
2. Write a definition for each of the four operations.
3. How do you check your work for addition/subtraction?
4. How do you decide which strategies and procedures to use to add and subtract large numbers?
5. How do you know when to use multiplication/division?
6. How do you know when to use division?
7. How do you know which operation to use?
8. When do you use fractions?
9. How are fractions and decimals alike?
10. How do you think fractions and decimals are different?
11. Design your own flag. Use fractions to describe its colored sections. Tell what is important to you about your flag.
12. What have you learned about fractional parts of sets? Explain.
13. What have you learned about ways to write a fraction?
14. How are decimals related to fractions?
15. How do you check division problems to see if they are correct?
16. How are multiplication and division related?
17. How are division and subtraction related?
18. Explain how fractions and decimals compare with an amount of money less than \$1.00.

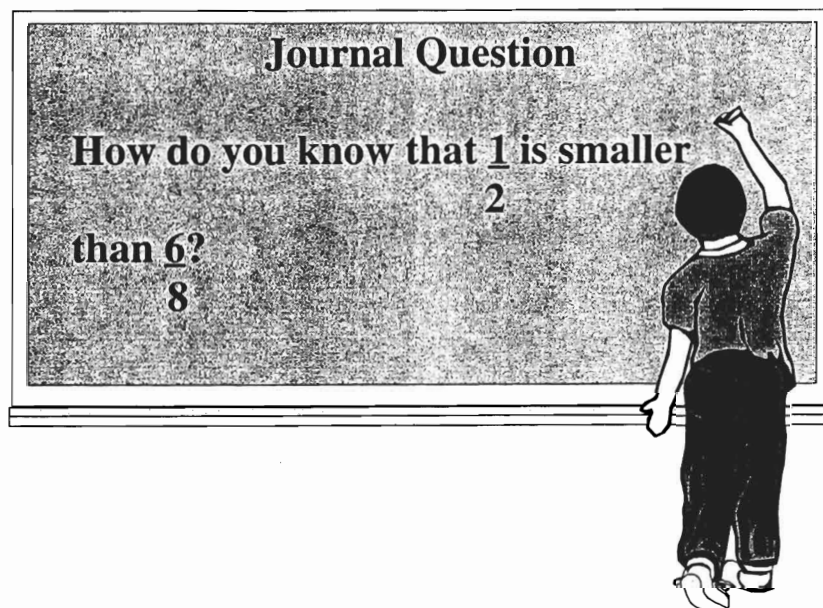
19. A visitor from Venus arrives at your school and is confused by the number on the school: 574. He asks, "Does 5 plus 7 plus 4 equal 574?" Answer his question and then explain your answer.
20. Show this number sentence is true in as many ways as possible: $8 \times 8 = 64$
21. Write a story problem that uses both multiplication and division.
22. Write a story problem using multiplication for which the answer is 56.
23. How often do you use decimals and fractions? Make a list of the times you them in a week.
24. What does the 1 mean in the question: $37 \div 6 = 6 \text{ R}1$
25. Your teacher said, "The answer is 24." What do you think the question was? Explain why you think this.



Grade 5

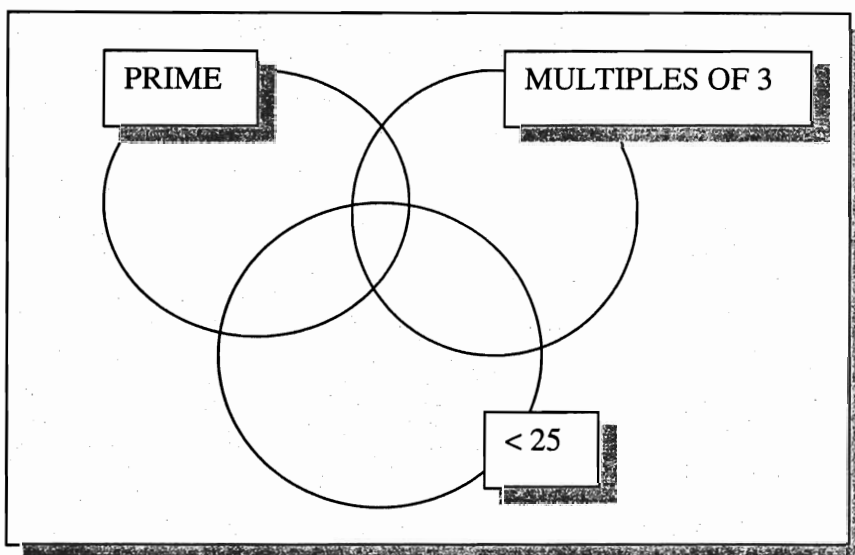
1. Describe your favorite estimation strategy. Explain why it is your favorite and when you use it.
2. When do you round off numbers?
3. If a number rounds to 8.7, what digit could have been in the hundredths place? Is there more than one possibility? Explain your answer.
4. These numbers (with a missing number) are written in order from least to greatest.
43__258 43__750 43__425
Could all 3 missing digits be the same? Explain.
5. a) List 5 numbers between 5.1 and 5.2.
b) Explain how you know that one of your numbers is really between 5.1 and 5.2
6. a) Two of the digits in a 3-digit number are 6 and 7. The number is a multiple of 2.
What could the number be?
b) Is more than one answer possible? Explain.
7. Some of my factors are 2, 3, 6 and 9. Who am I? Explain how you got your answer.
8. Your friend said that 50 is a prime number. Explain why you think he is right or wrong.
9. What do you know about reading and writing numbers greater than 999?
10. What do you know about comparing numbers greater than 999?
11. How do you compare numbers?
12. Which operations are easiest to use? Why do you think that?
13. Which operation do you use most often? Why do you think that is?
14. When might you use what you know about factors in real life situations?
15. How are strategies for multiplication and division related?

16. When do you think fractions and decimals are useful? Describe a situation in which you think it is better to see use one rather than the other.
17. Explain to a partner some rules for ordering decimals.
18. What do you know about how decimals are related to fractions?
19. How do you know when one decimal is greater than another? Use examples in your explanation.
20. When might you estimate rather than count? Give several examples.
21. Kay said that the zero in 15.09 is not really important. Do you agree with her?
22. Sam asked his teacher why we needed numbers larger than one million. What do you think Sam's teacher said? Be specific.
23. Dan made a chart to show equivalent fractions. He wrote $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$. What patterns do you notice? What would the next three fractions in the pattern?
24. Pat's calculator is broken. It doesn't put the decimal point in the right place. He added $41.9 + 3.01 + 5.78$. His calculator showed a sum of 1298. Do you agree with the calculator. Why or why not?



Grade 6

1. Name 5 numbers between 5.1 and 5.2. Choose one of your numbers. Explain how you know it is between 5.1 and 5.2.
2. What number could be in the thousandth place if a number rounds to 7.67? Explain.
3. Jill was upset because both her brother and her had recorded times of 7.68 for the 50-metre dash. If she was actually faster than her brother, what might her time have been if the timer had used a stopwatch that measured thousandths of a second? Explain.
4. Using the numbers from 1-50, complete the Venn diagram. Explain why one of the intersection spaces will always be empty.



(Answer: The intersection of the 3 sets will be empty because there can be no prime number greater than 25 that is also a multiple of 3. The only prime number that is a multiple of 3 is 3 itself.)

5. Find 4 numbers that would satisfy the following clues:
 - When you multiply the digits in each number, the answer is even.
 - When you add the digits in each number, the answer is even.
 - The number is less than 60.
 - The number is a multiple of 4.**(Answer: 20, 24, 28, 40, 44, 48)**

6. Find the prime factors for the following numbers. Use any method you wish, including mental computations.

$18=$ $70=$

$36=$ $24=$

$40=$ $81=$

$80=$ $60=$

$100=$ $90=$

7. Share examples of where integers are used everyday. (Teacher note: This could be an ongoing entry just change the topic.)

8. Draw and color a 5-cube train. Describe the number of colors in as many different mathematical ways as possible.

Sample rubric:

Low response -describes 1 form (example: ratio, fraction, decimal, or percent)

Medium response -describes 3 forms and shows relationships between at least 2 of the forms.

High response -describes all 4 forms and shows relationships among all forms.

9. Nick and Pam are combining their money to buy a gift. Together they have \$52.08. Maria has \$12.08 more than Nigel.

a) How much did each have before they combined their money? Explain.

b) Make up a new problem like this one.

10. Robert said that when he multiplied 43 by his secret number, he got 1204. Can you guess what his secret number is? Multiply it by 43 to check your guess. Record all guesses and verify by multiplication. Circle the answers.

11. Which of these expressions has the largest product?

7.8×87

8.4×78

8.7×7814

Explain how you know.

12. On November 23, 1942, a British ship sank in the Atlantic Ocean. A sailor from the ship was discovered on a raft along the coast of Brazil 132 days later. Approximately on what date was he discovered? Explain your thinking.
13. Explain whether you agree with each statement. Explain.
The answer to $6.4 \div 5.42$ is less than 0.
The answer to $5.22 \div 8.11$ is more than 1.
The answer to $7.2 \div 0.8$ is more than 5.
14. Bob needs to cut 7.92 m of rope into 6 equal lengths.
- a) Why might he estimate before he actually calculates the solution?
b) What might be a reasonable estimate for each length? If Bob has no calculator or pencil, explain how he might find the actual solution in his head.
15. A friend says she is thinking of a number. When 100 is divided by the number, the answer is between 2 and 5. Give at least 3 possibilities of what this number could be. Explain your reasoning. (You may use examples.)
16. Use base 10 blocks to represent these decimal numbers, 2.06 and 2.54. Show how you would add these two numbers using the base 10 blocks.
17. Are $\frac{3}{4}$ and $\frac{6}{12}$ equivalent? Show how you know.
18. Share examples of where percents are used everyday.
19. On an average day in Canada, about seventy-two thousand six hundred eighty-five Canadians celebrate their birthdays. Based on this information, estimate Canada's population. Explain your reasoning.
20. What does it mean if two numbers have a common multiple? Give examples to support your answer.
21. How do you decide to use an estimate and when to find an exact answer?
22. How are factors and multiples related? How are they different?
23. Is the zero important in the number 78.098?

Grade 7

1. $0.4 + 0.6 + 0.5 = 0.15$

Is this answer correct? Explain how you know.

2. $6.925 \times 3.87 = 2679975$

The digits in the answer are correct but need a decimal point. Explain where you would put the decimal point.

3. Give advice to a friend who hates problem solving.

4. Describe to a friend what you know about equivalent fractions.

5. Using a mental computation strategy explain the quickest way to do this problem.

$$2 \times 13 \times 5 =$$

6. Find 3 numbers that are evenly divisible by:

a) 2 c) 5

b) 4

7. If someone asks you how many seconds there are in one week, explain to them how to figure out this question.

8. Explain to a student how you would multiply 0.8×1.2 .

9. In your journal, explain to a student how the following numbers are the same.

$$3 \frac{3}{4} \quad 15/4 \quad 3.75$$

10. How do you use fractions in your life?

11. How are fractions and decimals alike? How are they different?

12. At her rummage sale, Destiny priced her comic books at 20 for \$1.00. She wrote the price on each comic book as 0.50¢ . Is she correct? Explain.

13. Which of the numbers is larger, 2^3 or 3^2 . Explain your answer.

14. Can $3 \frac{5}{7}$ be changed into a decimal? Explain.

15. Show through drawings a fraction that is close to 1.

16. Show through drawings a fraction that is close to half.
17. Write a pattern that begins with 5 and decreases by 3s. Explain your reasoning.
18. How would you explain a temperature change from 2°C to -10°C to a third grader?
19. Draw a picture that represents 75%. Explain how your drawing shows 75%.
20. Write a short story that uses five different fractions.
21. Your calculator is doing strange things. It doesn't always put the decimal in the correct place. You multiply 43.25 and 2.45. Your calculator shows 1.059625. Do you agree. Why or why not. Be specific.
22. Describe a situation in which you would use decimals. Why would decimals be used?
23. What does an exponent of 3 mean?
24. Why is scientific notation needed.
25. Tim found a prime number larger than 37 but smaller than 61. What number do you think he found? Prove that it is prime.
26. How do you decide to use an estimate and when to find an exact answer?



Grade 8 Journal Questions

- Extend the following patterns and explain the rule.
 - 14.6, 14.1, 13.6, _____, _____, _____, ...
 - 2.3, -2.7, -3.7, _____, _____, _____, ...
 - 9 996, 9 997, 9 998, _____, _____, _____, ...
- A computer requires 4.4×10^{-6} seconds to do an addition problem.
 - Write this number in standard notation.
 - Approximately how long does it take you to do the addition problem below? About how many times faster is the computer?
$$\begin{array}{r} 2.13 \\ + 3.9 \\ \hline \end{array}$$
- Tim wants to build a fence to hold her 9 rabbits. The fenced area needs to have 4 m^2 for each rabbit. Calculate the total area of the fenced space. If the fenced area is to be square, find the length of each side. How many metres of fencing should Tim buy?
- How would you estimate the square root of 109?
- Doris has $1 \frac{1}{3}$ large pizzas left over from a party. At lunch the next day, her family ate $\frac{3}{4}$ of the leftovers. Doris said they ate 1 whole pizza in total. Was Doris correct? Use words and diagrams to show how you know.
- On Monday, Alex's grandfather gave him \$20. He spent three-fifths of the money on Wednesday. He then spent three-quarters of what was left on Friday. How much money does he have left?
- Write what you know about reciprocals.
- Al uses 250 ml of sugar, 500 ml of flour, and 10 ml of baking powder to make 12 muffins. What quantities of sugar, flour and baking powder would Al need if he wants to make 36 muffins?
- Brooke brought a sweater originally priced at \$60 for \$45. Express the reduction in price as a percentage. Use estimation, then verify your thinking.
- Jane is about to take her final exam in Mathematics which is worth 30% of her final mark. Her term work is at 78% and is worth 70% of her final mark. What will she have to get on her final exam to get a final mark of 80%.

11. Jill went on a 5 day fishing trip with her father. Three-eighths of the fish they caught were perch and one-sixth was pickerel. The rest of their catch was jackfish. Express the amount of jackfish they caught as a fraction.
12. Use a picture to show how you would solve $1/2 \times 4/6$.
13. Two-thirds of the schoolyard was covered in grass. The parent council planned to replace one-quarter of the grass with a baseball diamond. How much of the school yard will the baseball diamond occupy? Include a diagram with your answer.
14. Explain with diagrams why dividing by one-half has the same effect as multiplying by 2. Use diagrams.
15. Explain why 4, 9 and 25 are called perfect squares.
16. In the parking lot, the ratio of cars, trucks, and vans is 5:2:1.
 - a) If there are 16 trucks, how many cars are there?
 - b) If one-fourth of the vans are red, how many red vans are there in the parking lot?
17. In Canada, there are 1 million curlers registered in 1 200 clubs. In Scotland, there are 50 000 curlers in 52 clubs.
 - a) Write a ratio for each country to compare the numbers of curlers to the number of clubs.
 - b) Arrange these in order from least to greatest.
18. A class of 25 students has an average mark of 65% on a written test. A second class of 21 students has an average of 60%. A third class of 23 has an average of 67%.
 - a) Find the average mark for all the students.
 - b) What was the unnecessary information in this problem?

Recommendations for Further Reading

- Burns, Marilyn. (1995). *Writing in math class*. Sausalito, CA: Math Solutions Publications.
- Countryman, J. (1992). *Writing to Learn Mathematics*. Portsmouth, NH: Heinemann.
- Dougherty, Barbara J. (2002). *The "Write" Way Mathematics Journal Prompts*. University of Hawaii, Honolulu, Hawaii.
- Manitoba Education and Training (1997). *Grades 5 to 8 Mathematics, A Foundation for Implementation*. Winnipeg, Manitoba
- Rogers Bosse, Nancy. (1995). *Writing Mathematics*. Mountain View, CA: Creative Publications.
- Van de Walle, John. A. (2001). *Elementary and Middle School Mathematics: Teaching Developmentally* (fourth edition), New York: Addison Wesley Longman, Inc.