

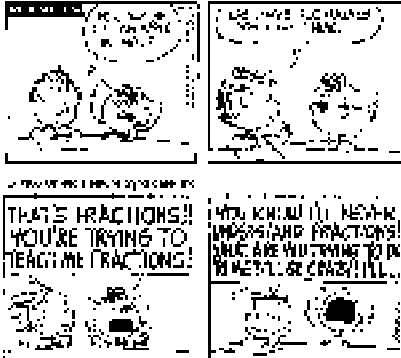
# Northwestern Michigan College

## MTH 106 - MATH FOR ELEMENTARY TEACHERS I

Instructor Debbie Pharo - Section 5180 - M/WF 1:00 - 1:55 - Fall 2003

### WHY Am I Taking This Course?

Because you want to  
be a **TEACHER**



To be a *good* teacher you  
must understand the  
**CONTENT**. This is a  
**CONTENT** course,  
NOT a methods course.

*Practice Makes  
Permanent!*

### WHAT Do I Need For This Course?

#### REQUIRED MATERIALS



#### Text:

*Mathematics for  
Elementary Teachers, 6/e*  
by Musser and Burger

*scissors, colored pencils,  
ruler (metric and English),  
graph paper, notebook pa-  
per, unlined paper, Imagi-  
nation!*



**Graphing  
Calculator  
TI - 83**

### HOW Do I Earn My Grade?

#### GRADING SCALE:

Percent ..... Grade

94-100 ..... 4.0

87-93 ..... 3.5

81-86 ..... 3.0

75-80 ..... 2.5

70-74 ..... 2.0

65-69 ..... 1.5

61-64 ..... 1.0

below 61 ..... 0.0

#### GRADE FACTORS

Homework ..... 20%

Paper ..... 10%

Tests ..... 45%

Final Exam ..... 25%

**HOMework MAY NOT BE  
MADE UP! THEREFORE,  
THE TWO LOWEST HOME-  
WORK GRADES WILL BE  
DROPPED.**

### OTHER VITAL, INDISPENSABLE INFORMATION...

**Office Location:** LB 33C

**Office Phone:** 995-1261

**Fax:** 995-2120

**E-Mail Address:** [dpharo@nmc.edu](mailto:dpharo@nmc.edu)

**Web Page:** [www.nmc.edu/~dpharo](http://www.nmc.edu/~dpharo)

**Blackboard:** [idtc.nmc.edu](http://idtc.nmc.edu)

**Office Hours:** Monday 10:15-11:00 & 2:00-3:00

Tuesday 10:15-11:00

Wednesday 10:15-11:00 & 2:00-3:00

Thursday 10:15-11:00

Friday 10:15-11:00

*and by appointment*

**Course Transferability:** The transfer of NMC courses is determined by the transfer institutions in cooperation with NMC. To check the transferability of this course, visit the web site <http://www.nmc.edu/%7Enmcexp/transfer.shtml>

**WARNING:** If you miss more than three consecutive classes without contacting me, I will no longer consider you part of this class. This **DOES NOT** mean you have withdrawn. You **CANNOT** withdraw simply by not attending. You will get a 0.0 on your transcript unless you formally withdraw at the Registrar's Office.

# ???WHAT IS MY GRADE???

**Paper - 10% of your grade**

Points Earned

Paper Grade \_\_\_\_\_  $\times 1 =$  \_\_\_\_\_

**Homework - 20% of your grade**

**Remember: If you miss a homework, you must enter 0 as your score.**

TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8
TP9	TP10	TP11	TP12	TP13	TP14	Extra Credit	

Homework Average \_\_\_\_\_  $\times 2 =$  \_\_\_\_\_

**Tests - 45% of your grade**

<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>	<b>Test 4</b>	<b>Test 5</b>

Test Average \_\_\_\_\_  $\times .45 =$  \_\_\_\_\_

**Total Points Earned =** \_\_\_\_\_  
Sum of above 3 Numbers

**Class Average =**  $\frac{\text{Total Points Earned}}{.75} =$  \_\_\_\_\_

# General Information

## Course Objectives:

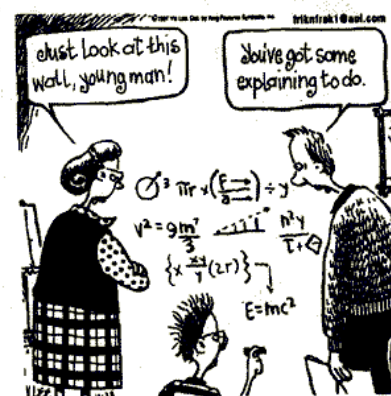
- Content:**
- Students will demonstrate an ability to problem solve using a variety of techniques.
  - Students will demonstrate the ability to work and think in other bases.
  - Students will demonstrate a working knowledge of sets and set operations as well as the use of Venn diagrams to diagram sets.
  - Students will demonstrate a working knowledge of mathematical algorithms for adding, subtracting, multiplying and dividing in base ten as well as other bases.
  - Students will demonstrate their understanding of number theory, including but not limited to: GCF, LCM, prime factorization and divisibility tests.
  - Students will demonstrate an understanding of properties of numbers by working with non-numerical groups and sets, as well as functions.
  - Students will demonstrate their ability to do fraction arithmetic using several different methods and strategies.
  - Students will demonstrate an ability to solve problems involving ratio and proportions.
  - Students will demonstrate their ability to solve problems involving decimals and percents.
  - Students will demonstrate their ability to perform order of operations problems.
  - Students will use mathematical vocabulary correctly when speaking and writing about mathematics.

- Attitudes:**
- Students will approach the mathematics in this course actively by immersing themselves in the ideas and exploring the connections and limitations of those ideas and communicating those ideas with the class.
  - Students must take personal responsibility for their learning.
  - Students will actively demonstrate that they understand that their attitude reflects on those around them. If they dislike a topic, this attitude will negatively influence those they are in contact with. \*\*A negative attitude in class may have a negative effect on your grade. Keep your negative attitudes to yourself.

## Assessment:

- **Tests** There will be five tests during the semester. Expect more than skill questions on tests. Questions will include skill, showing understanding, writing definitions, research, and problem solving.
- **Paper** You must do a **paper** on a mathematics-related children's literature book recommended for grade 3 or above. Your paper will describe the story line of the book, then will discuss the mathematics included in the book followed by a discussion about how the book could be used in a classroom setting. The conclusion to the paper will be a paragraph on your personal opinion of the book. You must support your opinions with passages from the book. The paper is due December 1. You must turn in the book with your paper. If you have borrowed the book from a library, make sure it is not due for at least a week after December 1.

I NEED HELP By Vic Lee



Einstein as a boy.

- **Homework:** I will assign problem sets from the book, but will not collect them. These problems are for class discussion.

Each week ten problems that I assign will be handed in. I call these problem sets ten-pointers. Ten-pointers will be handed out on Monday each week and will be due the following Monday. Late Ten-Pointers are not accepted for any reason. Your two lowest scores will be dropped at the end of the semester.

- **Final Exam** The final exam will be comprehensive and will be held the week of December 15. The final will take all three hours that week.

**Suggested Readings:** Here are three books that I have read that are worth your time: *Why Children Fail* by John Holt, *The Phantom Tollbooth* by Norton Jester, and *Understood Betsy* by Dorothy Canfield. The last two are children's literature and are very good reading for teachers.

## Makeup Policy

- **Ten-Pointers:** Late Ten-Pointers are not accepted for any reason. Your two lowest scores will be dropped at the end of the semester.
- **Tests:** If you miss a test, for any reason, you may take a make-up test December 9-11. The make-up test will be taken in the testing center in the library and may be taken any time they are open before 3:00 p.m. Thursday, December 11. If you have not missed a test, but would like to re-take a test for a better score, you may do so at this same time. You must let me know that you want a re-test by December 5.
- **Attendance:** You are expected to attend each class period. If you are unable to attend class for any reason, it is your responsibility to seek out the instructor for any assignments you have missed. Attendance itself is not a factor in the grading system, however, attendance is vital for success in this course. **Regular attendance is also required to maintain certain types of financial aid.**

## General Education Outcomes

MTH 106 meets level 1 and level 3 of the critical thinking general education outcomes which means that students will

- identify issues or problems and articulate a process for resolving them.
- demonstrate the ability to resolve problems or issues in one or more disciplines.

**MTH 106 - Course Calendar - Fall 2003**  
**Instructor Debbie Pharo - Section 1923 - M/W/F 1:00-1:55**

Date	Session	Section	Topic	Homework
Sept. 3	1	1.1	Problem Solving	Read 1.1 pp 12-15: 1.1A: 1, 3, 7 1.1B: 10, Disc. 1, 2
Sept. 5	2	1.1	Problem Solving	Read 1.1 pp 12-15: 1.1A: 11, 12 1.1B: 10, Disc. 1, 2
Sept. 8	3	1.2	Problem Solving	Read 1.2 pp 12-15: 1.1A: 2, 6, 8, 15, 16, 18 1.1B: 1, 2, 12
Sept. 10	4	1.2	Problem Solving	Read 1.2 pp 24-30: 1.2A: 1, 2, 6, 7, 8, 14 1.2B: 4, 5, 10
Sept. 12	5	1.2	Problem Solving	Read 2.1 pp 24-30: 1.2A: 1, 2, 6, 7, 8, 14 1.2B: 4, 5, 10
Sept. 15	6	2.1	Sets and set operations	Read 2.1 pp 46-51: 2.1A: 6, 7, 9, 10, 12-14, 16, 17, 29, 30 2.1B: 29, Disc. 3
Sept. 17	7	2.1	Sets and set operations	Read 2.2 pp 46-51: 2.1A: 15, 23, 26, 27, 34 2.1B: 26, 28, 31-33
Sept. 19	8		Test 1	
Sept. 22	9	2.2	Numeration	Read 2.3 pp 57-59: 2.2A: 7-10 part a only, 11, 18-20
Sept. 24	10	2.3	Other bases	Read 2.3 pp 67-70 2.3A: 1-3, 5-8, 11-17, 19, 20 2.3 B: 6, 8, 10, 11, 13, 16-18
Sept. 26	11	2.3	Other bases,	Read 2.4 pp 67-70 2.3A: 1-3, 5-8, 11-17, 19, 20 2.3 B: 6, 8, 10, 11, 13, 16-18
Sept. 29	12	2.4	Functions	Read 3.1 pp 78-85: 2.4A: 6-9, 12-14, 17-20
Oct. 1	13	3.1	Properties	Read 3.2 pp 104-109: 3.1A: 3, 4, 7, 10, 12, 14, 18, 19 3.1B: 3, 4, 8, 9, 11, 20, Disc. 1, 3
Oct. 3	14	3.1, 3.2	Properties	Read 8.1, & 8.2 pp 118-123: 3.2A: 3-7, 11, 12, 14, 20, 25, 26 3.2B: 5-8, 12-14, 16-19, 23, 25, Disc. 1, 2

Date	Session	Section	Topic	Homework
Oct. 6	15	3.2	Properties, division with zero	Read Chapters 3 and 8 Finish Chapter 3 homework
Oct. 8	16	3 & 8	Understanding properties	Read 4.1 pp 134: Disc. 1, 3, 5, 7-9 pp 135-136 Chapter Test, all
Oct. 10	17		Test 2	
Oct. 13	18	3 & 8	Properties Questions & Answers/Catch-up	
Oct. 15	19	4.1	Algorithms	Read 4.1 pp 148-153: 4.1A: 1-5, 9, 15, 30, 32; p 164 #4 4.1B: Disc. 1, 2; p 168#11, 12; p 169 #18
Oct. 17	20	4.1	Algorithms	Read 4.2 pp 148-153: 4.1A: 1-5, 9, 15, 30, 32; p 164 #4 4.1B: Disc. 1, 2; p 168#11, 12; p 169 #18
Oct. 20	21	4.2	Add/ Subtract algorithms	Read 4.2 again pp 164-171: 4.2A: 2, 5, 12, 15-17, 20, 23, 25 4.2B: 1 b,c,4,5,7b,c, 15, 17, 22,23,28,29
Oct. 22	22	4.2	Intermediate & standard algorithms	Read 4.3 pp 164-171: 4.2A: 3, 6, 9, 11, 22, 29-31 4.2B: 2, 13, 14, 20, 30, 31, Disc 2, 3
Oct. 24	23	4.3	Add/ Subtract in other bases	Read 4.3 again pp 174-177: 4.3A: 1 a, b, d, 2-8, 13, 14 4.3B: 1 a, b, d, 2-8, Disc. 1, 2
Oct. 27	24	4.3	Multiply/divide in other bases	Read 5.1 pp 174-177: 4.3A: 1c, 9-12, 16 4.3B: 1c, 9-12, 14, 15, Disc. 3
Oct. 29	25	5.1	Number Theory	Read 5.2 pp 192-197: 5.1A: 1-13, 15, 16, 23, 29, 30, 33, 35, 36, 39, 44 5.1B: Disc. 2, 3
Oct. 31	26		Test 3	
Nov. 3	27	5.2	Number Theory	Read 5.2 pp 206-210: 5.2A: 1-4, 6, 7, 10, 11, 13, 14, 17-20, 22, 25, 26 5.2B: Disc. 2, 3
Nov. 5	28	5.2	Number Theory	Read 6.1 pp 206-210: 5.2A: 1-4, 6, 7, 10, 11, 13, 14, 17-20, 22, 25, 26 5.2B: Disc. 2, 3
Nov. 7	29	6.1	Rational Numbers, add/subtract	Read 6.2 pp 226-230: 6.1A: 1-15, 17-25; <b>6.1B:</b> 15, 18, Disc. 2, 3

Date	Session	Section	Topic	Homework
Nov. 10	30	6.2	Rational Numbers, add/subtract	Read 6.3 pp 237-241 6.2A: 3, 4, 6-9, 11, 16-29 6.2B: 21, 24, 28, Disc. 2-4
Nov. 12	31	6.3	Rational Numbers, multiply/divide	Read 6.3 pp 252-257: 6.3A: 2-11, 13-15, 19-32 6.3B: 27, 28, 30, Disc. 2, 3
Nov. 14	32	6.3	Rational Numbers, multiply/divide	Read 9.1 pp 252-257: 6.3A: 2-11, 13-15, 19-32 6.3B: 27, 28, 30, Disc. 2, 3
Nov. 17	33	9.1	Rational Numbers, problem solving	Read 7.3 pp 368-372: 9.1A: 1, 2, 5-11, 16, 30 9.1B: Disc. 1, 2 p 259 Disc. 1-3, 5, 8
Nov. 19	34	7.3	Ratio and proportion	Read 7.1 pp 291-296: 7.3A: 1, 6, 7, 12, 13, 17, 18, 21, 22, 24, 7.3B: Disc. 1, 3 27, 28, 32
Nov. 21	35		Test 4	
Nov. 24	36	7.1	Decimals	Read 7.2 pp 271-274: 7.1A: 1-5, 7, 9-12, 19 7.1B: 5, 19, Disc. 3
Nov. 26	37	7.2	Decimals	Read 7.2 pp 281-286 7.2A: 1-6, 10, 12, 16-19, 25, 29 7.2B: 12, 18, 20, 22
Dec. 1	38	7.2	Decimals	Read 7.4 pp 281-286 7.2A: 1-6, 10, 12, 16-19, 25, 29 7.2B: 12, 18, 20, 22
Dec. 3	39	7.4	Percents	Read 9.2 pp 305-311: 7.4A: 1-6, 14, 16-19, 25, 28, 30-41
Dec. 5	40	7.4	Percents	Read 9.2 pp 305-311: 7.4A: 1-6, 14, 16-19, 25, 28, 30-41 Bring an unusual can (cykinder) and a piece of string to the next class. (15"-20" long)
Dec. 8	41	9.2	Real Numbers	pp 386-387: 9.2A: 1-4, 6, 7, 9, 10, 11, 19-21
Dec. 10	42		Test 5	
Dec. 12	43		Review for final	
Dec. 15	44		Final Exam	
Dec. 17	45		Final Exam	
Dec. 19	46		Final Exam	

## **Math For Elementary Teachers I**

### **Book Report Grading Rubric**

You must do a **paper** on a mathematics-related children's literature book recommended for grade 3 or above. Your paper will describe the story line of the book, then will discuss the mathematics included in the book followed by a discussion about how the book could be used in a classroom setting. The conclusion to the paper will be a paragraph on your personal opinion of the book. You must support your opinions with passages from the book. The paper is due December 1. You must turn in the book with your paper. If you have borrowed the book from a library, make sure it is not due for at least a week after December 1.

#### **Presentation**

- 0 ..... Paper is not typed.
- 1 ..... Paper is typed, but has spelling and/or grammar errors.
- 2 ..... Paper is typed and error free.

#### **Story Line:**

- 0 ..... Student did not describe the story line at all.
- 1 ..... Student described the story line.

#### **Mathematics**

- 0 ..... Student did not write about the mathematics in the book.
- 2 ..... Student wrote about some of the mathematics, but missed some key elements.
- 4 ..... Student wrote about all of the key mathematical concepts in the book.

#### **Classroom Use**

- 0 ..... Student did not write about classroom uses of this book.
- 1 ..... Student cited one or more classroom uses of this book.

#### **Conclusion**

- 0 ..... Student did not write a personal opinion of the book.
- 1 ..... Student wrote a personal opinion, but did not back it up with passages from the book.
- 2 ..... Student wrote a personal opinion and backed it up with passages from the book.

**Total possible points: 10**