

NPTT PROGRAM

EDCI 558 PORTFOLIO

James F. McCue

Table of Contents

Assignment 1.....	3
Assignment 2.....	7
Assignment 3.....	12
Assignment 4.....	21
Assignment 6.....	27
Assignment 7.....	30
Assignment 8.....	32
Assignment 9.....	33
Assignment 10.....	35
Assignment 11.....	37

Assignment 1

Safety Concerns for My Math Classroom

Jim McCue

Montana State University—NPTT 558

EDCI 558

Margaret Bowles

September 05, 2006

Safety Concerns for My Math Classroom

Examining and addressing safety concerns in the classroom is of high priority for teachers. This paper will identify specific concerns for my classroom at Clearwater Valley High School in Kooskia, Idaho in a plan that I will use for the school year. During new teacher orientation for Joint School District #241, it was reported that what parents considered most important when polled included safety of their children, followed by their children fitting in and being accepted at school, and finally the quality of education being provided. This highlights how important it is to the community that teachers keep a constant vigil on student safety.

My research consisted of walking around the school to become familiar with layout and to identify potential safety issues, such as where the exits and fire hydrants are located in case of fire emergency, location of phones to call outside for help, and where fire alarms are located. Second, I spent considerable time within my classroom evaluating potential safety hazards. I checked all the outlets with a tester to make sure there were no short circuits. My classroom has not been used for several years so I double checked everything electrical. I also made sure my student desks were spaced apart to allow for even flow of evacuation of my classroom if required. Finally, I searched for all safety procedures maintained by the school district and my high school to familiarize myself with the existing policies and to identify any missing ones so efforts can be started in creating them by the school district.

My high level safety plan is to first become familiar with my school from a safety aspect, such as the physical surroundings of the school. Second, I will maintain and learn all safety procedures that have been outlined by the school so as to be able to implement them when required. I will have a current hard copy of these procedures posted at my desk wall for easy

access. Finally, I will address my safety concerns with my principal so procedures can be updated or created.

I now feel comfortable with the physical surroundings of the school and the location of all exits, fire extinguishers and alarms. However, I will post an evacuation route diagram in my classroom for visual reference. Upon review of my classroom, all electrical outlets and devices work properly and no known safety hazards exist. My school district maintains an excellent policy manual online (*Student Policies Handbook*) with many safety procedures in place. Listed below are the safety policies available:

- Bomb Threat
- Student Arrest
- Health and Welfare (used for child abuse reporting)
- Weapons
- Search and Seizure
- Sexual Harassment
- Crisis Intervention
- HIV/AIDS
- Drug & Alcohol
- Prohibition of Gang Activity
- Student Suicidal Tendencies

I discovered the following policies missing and will address them with my principal this week.

- Fire Drills
- Terrorist Attacks
- Parent Kidnapping
- Lockdown Procedures

With Clearwater Valley High being a small school of about 135 students, I feel confident that we have at least informal procedures on fire drills that are executed several times a year. I just need to inquire what they are. However, the remaining procedures listed need to be addressed by the joint school district and policies created as soon as possible.

References

Joint School District 241. *Student Policies Handbook*. Retrieved September 4, 2006, from <http://www.jsd241.org/policymanual/500/index.html>.

Assignment 2

National and Idaho Mathematics Standards

Jim McCue

Montana State University—NPTT 558

EDCI 558

Margaret Bowles

September 10, 2006

National and Idaho Mathematics Standards

In response to the No Child Left Behind Law (NCLB) of 2001, national and state standards were set for mathematics education. This paper will summarize and compare those standards and also includes a high level overview of my curriculum plan for my Algebra I and II classes.

For mathematics, the National Council of Teachers of Mathematics (NCTM) created the first national standard for high school mathematics back in 1996. The current version is maintained at their web site ("Principles and Standards for School Mathematics"). It is very well organized with high school standards for grades 9 to 12. The NCTM laid the foundation for the NCLB to establish standards for students to meet in order to graduate. States must meet these or suffer financial consequences.

For Idaho, where I teach at Clearwater Valley High school in Kooskia we follow the Idaho Department of Education Math standards ("Mathematics Content Standards and Assessment By Grade Level"). Upon review, a strong correlation exists between Idaho and NCTM standards. This is good news for Idaho teachers (including me) who happen to be using the Prentice Hall Mathematics series covering Algebra I and II, along with Geometry. This series, published in 2004, maintains a very strong one-to-one matching showing how and where the series matches the NCTM standards. Listed below are the ten high level NCTM standards for grades 9 to 12 that are broken down into components. The series then cross references each of the three books' chapters to the standard. This allows math teachers to trust the series to cover the national standards; so that they can focus on how to present the material and help students

learn math skills they need to achieve proficient scores on Idaho's Standards Achievement Test (ISAT).

1. Number and Operations
2. Data Analysis and Probability
3. Algebra
4. Geometry
5. Measurement
6. Problem Solving
7. Reasoning and Proof
8. Communication
9. Connections
10. Representation

For my Algebra I and II classes, I will meet the NCTM standards and the Idaho's state math standards due to their strong correlation with the Prentice Hall Mathematics series my school uses. Knowing this allows me to focus on covering the chapters in both courses and not be concerned about having "gaps" in course content. Instead, I can simply lay out a schedule to cover all the chapters using the time recommendations in the teacher's edition. This allows me to block out each chapter and match it to the school's calendar.

My high level curriculum plan for my classes is fairly straightforward. Upon review of all the chapters in both courses, the sequence given for each is well organized and builds on the previous chapter's content. So I will follow sequentially from chapter one to chapter twelve for Algebra I, and from chapter one to chapter fourteen in Algebra II. For the first two weeks of school, I will be reviewing the skills handbook at the end of each course. This enables the students to brush up on last year's skills and gain a solid foundation on which to build this year's math skills. Also, my curriculum will contain semester math projects; so that students have an opportunity to experience mathematics applied to real life situations. Tentatively, I've scheduled a fall project on building a backyard patio and calculating all materials required and associated labor costs to build. For the spring semester, students will do a personal finance project to learn

how important math skills are to creating budgets and understanding finance formulas, such as interest rate calculations on credit cards. Finally, students will maintain math notebooks, having notes and homework for every section covered.

References

Idaho Department of Education. *Mathematics Content Standards and Assessment By Grade*

Level. Retrieved September 10, 2006, from

<http://www.sde.state.id.us/instruct/standards/documents/subjectpages/Mathstandardstests>.

<http://www.sde.state.id.us/instruct/standards/documents/subjectpages/Mathstandardstests.htm>.

National Council of Teachers of Mathematics. *Principles & Standards for School Mathematics*.

Retrieved September 10, 2006, from <http://standards.nctm.org/http://standards.nctm.org/>.

Assignment 3

Teacher: Jim McCue

Class: Applied Mathematics

Date: September 17, 2006

Grade Level: 11/12

Noise Level: Moderate

Unit #: 1

Lesson #: 1

Topic: CVHS RAM Garden

Standards: NCTM Standards: Measurement, Problem Solving, Reasoning and Communication

Objective: Students will propose a Rock Garden Design for Clearwater Valley High School Rams using applied math to help determine design options and their associated costs. Student behavior expected for this unit is active participation in two-person teams who will determine math solutions for the design options to be considered. Class participation is required, with each team generating a design report of their findings.

Procedures:

3. Intro and Sketch: Students will listen and take notes on the RAM Garden project. An area outside that had been used for a mobile trailer is now empty. Several trees, a gazebo, the grass area and the footprint of the former trailer could be transformed into a rock garden. In a new patio in the garden, each graduating class will paint a class picnic table on which they will sign their names. This RAM garden could be used for many school activities, including lunch and waiting for buses. It could also be used for outdoor instruction, such as the Reading and Math (RAM) period held Monday through Thursday. Students will draw a sketch of the current landscape with measurements to be included in the report. (one period)

4. **Patio Option:** Students will calculate three patio options for the school to consider: concrete, one foot pavers, and eighteen inch pavers. The amount of material required and associated cost will be included in a one page report. (one period)
5. **Fence Option:** Students will calculate a perimeter fence option determining the amount of fence needed and the associated cost. Two different types of fences will be proposed in the report. (one period)
6. **Picnic Table Option:** Students will calculate the cost of building a six-foot picnic table and then determine how many tables could be placed on the patio, along with the total cost of the tables. This will be included in the report. (one period)
7. **Summary and Final Report:** Students will prepare their final report and a summary class discussion will occur, along with class assessment of each report.

Assessment: Students will be assessed during class on ability to apply basic math techniques to propose options for the RAM garden. Also, each team's final report will be assessed for how well the options are laid out, organized and communicated. My own assessment will be based on my ability to help students realize the importance of using mathematics and presenting a report that can be easily evaluated by decision-makers who would approve it based on accuracy and ease of understanding.

Differentiation: I will be going around to each team and the individual students during class to provide guidance in solving the options proposed for the RAM Garden. I anticipate that two students will need extra assistance, based on my evaluation of their current math skills.

Teacher: Jim McCue

Class: Algebra I

Date: September 17, 2006

Grade Level: 9/10

Noise Level: Moderate

Unit #: 1

Lesson #: 2

Topic: Algebra I: Chapter 1: Section 1 (Using Variables)

Standards: NCTM Standards: Number and Operations, Algebra, Communication, and Representation.

Objective: The following objectives will be achieved by the students in this lesson:

1. Learn how to model relationships with variables.
2. Learn how to model relationship with equations and formulas.

Procedures: For this one day lesson, the following procedures will be conducted in class:

1. A brief intro will be given to introduce using variables in algebra. (2 minutes)
2. Class will open text books to section 1.1 page 4 and read and review the material for ten minutes with instruction to focus on new terms and examples given. (10 minutes)
3. Students will take personal notes in their notebooks following terms and math problems written on the board showing how math expressions can be written from “word expressions”. This will include examples for expressions using variables in equations and formulas. (20 minutes)
4. Homework assignment will be given for section 1.1 page 6, problems: 1-33 odd. Class time will be used by the students to work on assignment, while I provide individual assistance upon request by students. (15 minutes)
5. Next day, a brief review of homework problems will be conducted with students putting random problems on the whiteboard while I work any difficult problems encountered by the class. Also, any questions by the class will be answered. (10 minutes)

Assessment: Students will be assessed during class on their ability to answer questions about the objectives being reviewed. Also, board problems will be completed by random students to see if basic math skills are known and used for problems at hand. Homework assignments will be given for all objectives covered and I will be spot checking random problems to insure students have mastered these basic Algebra I skills. The first test will include problems from this section.

Differentiation: I will be going around the class after a brief explanation of the skills for the day to provide individual assistance to those who request help. Also, when students have completed the assignment for the day, they will be encouraged to help fellow students who need some reminders on how to execute the skill.

Teacher: Jim McCue

Class: Algebra II

Date: September 17, 2006

Grade Level: 11/12

Noise Level: Moderate

Unit #: 1

Lesson #: 3

Topic: Skill Handbook Review for Algebra II

Standards: NCTM Standards: Number and Operations, Algebra, Problem Solving, Connections

Objective: Students will review and brush up on Algebra I skills from two years ago by performing nine math skills from the handbook at the end of the book. This will prepare them for new Algebra II concepts.

Procedures: For this one week unit, the class will cover two skills per day except for Friday as indicated below:

1. Monday Skill #842: Percent and Percent Applications
Skill #843: Operations with Fractions
2. Tuesday Skill #844: Ratios and Proportions
Skill #845: Simplifying Expressions with Integers
3. Wednesday Skill #848: The Coordinate Plane, Slope and Midpoint
Skill #851: Graphing Two-Variable Equations and Inequalities

4. Thursday Skill #849: Solving Linear Equations and Inequalities

Skill #852: Operations with Exponents

5. Friday Skill #853: Factoring and Operations with Polynomials

First, I will prepare myself for this unit by carefully reading and solving the problems in each skill covered. This will allow me to explain each skill using the minimum amount of time and quickly put problems on the board when required. The basic procedures for each day will include my brief explanation of the skills, followed by examples written on the board. After that, an interactive question and answer period will ensure that all students grasp/remember how to perform the math skill. Next, a homework assignment will be given in class for the skills covered and the remaining time will be used to begin the problems, while I circulate around the classroom to provide assistance when requested by students. The next day, a brief review of the problems will be conducted with random answers to problems given as determined by the class.

Assessment: Students will be assessed during class on their ability to answer questions about the skill being reviewed. Also, board problems will be completed by random students to see if basic math skills are known and used for problems at hand. Homework assignments will be given for all skills covered and I will be spot checking random problems to insure students have mastered these basic Algebra I skills. The first test will include problems from these math skills.

Differentiation: I will be going around the class after a brief explanation of the skills for the day to provide individual assistance to those who request help. Also, when students have completed the assignment for the day, they will be encouraged to help fellow students who need some reminders on how to execute the skill.

Teacher: Jim McCue
Class: Basic Algebra
Date: September 17, 2006

Grade Level: 9

Noise Level: Moderate

Unit #: 1

Lesson #: 4

Topic: Skill Handbook Review For Basic Algebra (Short Plan)

Standards: NCTM Standards: Number and Operations, Algebra, Problem Solving, Connections

Objective: Students will review and brush up on pre-Algebra I skills from last year by performing five math skills from the handbook at the end of the book. This will prepare them for new Algebra I concepts.

Procedures: For this one week unit, the class will cover one skill per day as indicated below:

1. Monday Skill #721: Factors and Multiples
2. Tuesday Skill #725: Fractions and Decimals
3. Wednesday Skill #726: Add, Subtract, Multiply and Divide Fractions
4. Thursday Skill #729: Exponents
5. Friday Skill #731: Perimeter, Area and Volume

The basic procedures for each day will follow the same format as Lesson #3 for Algebra II.

Assessment: Students will be assessed the same way as Lesson #3 for Algebra II.

Differentiation: I will be going around the class after a brief explanation of the skill for the day to provide individual assistance to those who request help. Also, when students have completed the assignment for the day, they will be encouraged to help fellow students who need some reminders on how to execute the skill.

Personal Reflection on the Impact of Lesson Plans on My Teaching

Being a first year high school math teacher with two Algebra I classes, two Algebra II classes, one Basic Algebra class and one Applied Mathematics class, I've discovered three different levels of planning are critical to my success as a teacher. The first level focuses on the high level year block scheduling required for each course to insure all material is covered. I did not have enough time to customize this for my four courses. However, my teacher's edition of Algebra I and II provides this information and allows me some cushion. Next summer, I will create my own block scheduling with completion dates for units covered.

My second level of planning uses a typical teacher's scheduling/planning book. On Friday afternoon, I like to schedule the next week's lessons and activities for my classes based on the various factors that affect students in my classes. This allows me to "pencil" in lesson plans for the upcoming week and prepare myself for the many types of math skills that will be covered in my four math courses. For math teachers, it's critical to have reviewed and practiced the math problems for the lessons being covered for the day.

Finally, the third level of planning focuses on the detailed lesson plans required for every period of every day of a 180 day school year. This can be an exhausting task, but simply must be done to insure success in the classroom, even if "short" lesson plans are written during the first year of a teacher's career.

Assignment 4

Teacher: Jim McCue
Class: Applied Mathematics
Date: September 24, 2006

Grade Level: 11/12
Duration: 10 days
Unit: #: 2

Topic: Unit 2: Applied Personal Finance Math

I. Purpose:

The purpose of this unit is to provide students the opportunity to experience real life application of mathematics to their own personal finances. Several lessons will be covered that allow the students to research and create their own personal reports based on their findings and calculations.

II. Rationale:

The rationale for this unit is based on the ever increasing need for students to realize how important personal finance is going to be in their adult lives and how applying mathematics skills and research will allow them to learn finance skills and manage their money.

III. Unit Goals:

The goals of this unit for students are as follows:

1. Understand where income comes from and how taxes are deducted from paychecks.
2. Create a personal budget.
3. Determine how to find competitive checking and savings accounts and then use and maintain them.
4. Understand the basic concepts behind credit cards and how to manage them.

IV. Unit Objectives:

Students will be engaged in four lessons for this unit that will allow them to experience personal finances. They will understand net income and be able to create their own personal budget.

Next, students will conduct internet research in determining which banks provide the best checking and saving accounts for them. Finally, students will understand the concept of credit

cards and usage charges they will incur. The following four lesson plans will be exercised.

- 2.1 Personal Income
- 2.2 Personal Budget
- 2.3 Checking and Saving Accounts
- 2.4 Credit Cards

V. Unit Overview:

The following overview of the unit is given for each day of the unit:

1. Monday Present a quick overview of unit to class and cover Lesson 2.1: Income
 - Students will take minimum wage earnings for a 40-hour week, calculate their net income and produce a report of their results.
2. Tuesday Continue Lesson 2.1 with students turning in reports.
3. Wednesday Begin Lesson 2.2: Personal Budget
 - Students learn what a personal budget is and begin to work on their own budget using a sample of typical expenses of living on their own, using the net income calculated in lesson 2.1.
4. Thursday Complete Lesson 2.2
 - Students will complete and turn in their budgets.
 - Students will discuss the impact of their budgets and share what they could do to improve cash flow.
5. Friday Class discussion on career choices and the impact on net income and budget.

6. Monday Cover Lesson 2.3: Checking and Saving Accounts
- Students will be given basic information on checking and saving accounts.
 - Students will begin internet research on banks to choose best accounts for themselves.
7. Tuesday Complete Lesson 2.3
- Students will complete research report on their findings for accounts.
8. Wednesday Cover Lesson 2.4: Credit Cards
- Students will be provided basic information on how credit cards work.
 - Students will begin research on finding the “best” credit card for themselves by comparing three different ones.
9. Thursday Complete Lesson 2.4
- Students complete report on credit card analysis and turn in.
10. Friday Class discussion of Unit and the impact of personal finance in their lives.

VI. Assessment of Student Achievement:

Student assessment will be based on daily observations by the teacher of each student’s understanding of the lessons being taught by question and answer technique. With only 7 students in the class, much individual instruction can occur while students are conducting their research and creating their reports. Also, a rubric will be created for each report to assess the students’ understanding and application of mathematics to the personal finances covered in the unit.

Teacher: Jim McCue	Grade Level: 11/12
Class: Applied Mathematics	Duration: 10 days
Date: September 24, 2006	Unit: #: 3

Topic: Unit 3: Applied Personal Consumer Math

I. Purpose:

The purpose of this unit is to provide students the opportunity to experience real life application of mathematics to consumer finances. Several lessons will be covered that allow the students to research and create their own personal consumer reports based on their findings and calculations.

II. Rationale:

The rationale for this unit is based on the ever increasing need for students to realize how important consumer math is going to be in their adult lives and how applying mathematics skills and research will allow them to learn consumer skills to manage their money and maximize their buying potential.

III. Unit Goals:

The goals of this unit for students are as follows:

1. Understand the financial aspect of buying a used or new car.
2. Understand the financial aspect of maintaining a used or new car.
3. Understand the financial aspect of renting an apartment compared to buying a house.
4. Understand the financial impact of obtaining a mortgage loan.

IV. Unit Objectives:

Students will be engaged in four lessons for this unit that will allow them to experience personal finances. They will understand net income and be able to create their own personal budget.

Next, students will conduct internet research in determining which banks provide the best checking and saving accounts for them. Finally, students will understand the concept of credit cards and usage charges they will incur. The following four lesson plans will be exercised.

- 3.1 Financial Aspect of Buying a Car
- 3.2 Financial Aspect of Maintaining a Car
- 3.3 How to Compare Renting to Owning a Residence
- 3.4 Financial Aspect of Securing a Mortgage Loan

V. Unit Overview:

The following overview of the unit is given for each day of the unit:

- 1. Monday Present quick overview of the unit to class and cover Lesson 3.1: Buying a car
 - Students will be provided with basic financial information on buying a car.
 - Students will begin research on securing a car loan.
- 2. Tuesday Continue Lesson 3.1
 - Students complete research and turn in report of their findings.
 - Class will discuss findings.
- 3. Wednesday Begin Lesson 3.2: Maintaining a car
 - Students will learn the basic costs of operating and maintaining a car and how to budget this into their decision of what type of car to buy.
 - Students will begin research on car costs such as insurance.

4. Thursday Complete Lesson 3.2
- Students will complete research and turn in report of their findings.
 - Students will discuss the impact on their budgets and brainstorm solutions for lowering costs.
5. Friday Class discussion on the high cost of car ownership and the impact on budgets.
6. Monday Cover Lesson #3.3: Rent or buy a house?
- Students will be given basic information on each option.
 - Students will begin internet research on financial comparisons to determine the pros and cons of each choice.
7. Tuesday Complete Lesson #3.3
- Students will complete research report on their findings for accounts and turn in report of their comparison.
 - Students will share their thoughts on why they choose to buy or rent a place.
8. Wednesday Cover Lesson #3.4: Securing a Mortgage Loan
- Students will be provided basic information on the financial requirements and the total costs of securing a mortgage.
 - Students will be shown how interest is calculated and what the total interest would be for the length of the loan.
 - Students will begin research on finding the “best” mortgage loans at financial institutions on the internet.
9. Thursday Complete Lesson #3.4
- Students will complete research on mortgage loans and present their mortgage choice and reasoning.
 - Students will discuss their findings in class.
10. Friday Class discussion of the Unit and the impact of consumer finance in their lives.

VII. Assessment of Student Achievement: same as Unit 2.

Assignment 6

This reflective response addresses how the history and philosophy of teaching mathematics impacts how I teach high school math. One might think that teaching mathematics would be stagnant considering that the subject has not changed within the high school courses of algebra, geometry, trigonometry and calculus. However, many changes have occurred due to changing philosophies over the past decades and the impact of technology within the classroom. A brief overview of the changing teaching strategies will be covered to set the background to how my teaching strategies address the needs of today's student.

My resource for this paper is based on my personal conversations with two veteran math teachers, Karen Hodge of Missoula, Montana and Linda Burnside of Kooskia, Idaho, who both have over thirty years of teaching math. I consider myself very fortunate to be able to learn from them and tap into their own personal perspectives of what has occurred in the math teaching profession the past thirty plus years. I have found their information valuable for me in bridging the gap from when I was in high school during 1974 to 1977 and today and the many changes that have occurred.

During the 1970s, high school math was taught from black and white text books and was considered "dull" material to learn by high school students. The basic teaching philosophy was to drill the math skills into students by assigning many of the same type of problems over and over until the student's short term memory was "wired" with the correct math rules to allow the accurate reproduction of the math problems. This was in conjunction with the concept that students needed to learn the basics first to establish a foundation of math skills to handle more complex math problems in high school and college.

The 1980s saw the introduction of calculators, from high school down into middle

schools and even elementary schools, and that changed how the basics were taught. Also, text books began a transformation to using color and better organization to help make mathematics more interesting and fun for students. These events signaled a change in teaching math by taking out the drudgery of “boring math skills” that the calculator could be used for and centered on getting students to focus on using math skills for problem solving. While giving students a purpose for using math is great, a slide in their basic math skills began with this “advancement” that continued well into the 1990s.

The affordability of calculators helped establish technology in the classroom. Then, the next generation of calculators, called graphing calculators, became mainstream and offered the capability to graph functions on a small screen. This impacted how math was taught when textbooks began to incorporate graphing calculators into Algebra and Geometry courses. Both subjects were “Integrated” together and students were now expected to have and use calculators throughout high school. This shift further eroded students’ ability to graph functions by hand and the dependence on them was ingrained. Teachers were facing a tough situation in getting students to put forth the required discipline needed to truly learn math skills and solve problems using just their minds. This reached such a crisis point that in 2001, the No Child Left Behind Law (NCLB) was passed and forever changed strategies of how math should be taught due to quotas of proficiency that must be met. Also, math computer programs such as PLATO began to enter the classrooms that had PCs to supplement students learning skills. Unfortunately, PLATO has evolved into a course credit recovery option that schools use instead of teachers. This is taking students further away from teachers’ interaction in learning.

My platform for teaching high school math is based on using strategies that can best help students truly learn the mathematics skills needed to become problem solvers, so that they can

apply them in today's real world. I've conducted an informal analysis of the past philosophies that have weakened students' math skills and have assembled a three prong strategy. My first strategy is focused on teaching math skills that enable the student's long term memory to be utilized and not only the short term memory that has been used in the past. Students must make long term connections to *understanding* math rules and not just memorizing them for a test and then forgetting them afterward. The key to this instruction is based on teaching the *principles* of mathematics and how the rules are made, so mathematical relationships are formed in the student's mind. The second strategy is getting back to teaching/learning and practicing the basics skills of mathematics. Many students in high school struggle with fractions and percentages, as an example, and doing quick math in their minds. A constant emphasis on expanding the mathematical foundations of students and the ability to execute the skills properly is critical to students' ability to perform complex problem solving in high school math courses. My third prong is based on showing students how mathematics can be used to conduct problem solving in real life applications and how critical obtaining these math skills is for today's students to achieve success in their lives. Giving students applied math projects is a key technique I use to hook the students in realizing how important math is to them. Coming from the engineering profession, I've seen how important mastering these high school math skills and learning how to apply them to their lives and careers is to a student's success.

Also, I believe this platform I have described will pave the way to higher scores on Montana's CRT and Idaho's ISAT standardized tests that NCLB requires now. When students know and can perform the math skills on the tests, the results should be positive. My goal is not to focus on CRT or ISAT test scores, but for students to really learn and apply their math skills. When that happens, the high scores will occur.

Assignment 7

Teacher: Jim McCue
Class: Algebra II
Date: October 15, 2006

Grade Level: 11/12
Noise Level: Moderate
Unit: #: 1 Lesson #: 7

Topic: **Book Shelf: One Period Math Project**

Standards: NCTM Standards: Measurement, Geometry, Problem Solving, Reasoning, Representation and Communication.

Objective: Students will work on page 51 of the Algebra II book concerning the building of an “A” frame book shelf. They must analyze the information presented and answer the ten questions presented. They must show how they determined their answers and present it in a one page project format. This in period assignment is worth 10 points and counts towards their Project category worth 5% of their grade.

Procedures:

1. Introduction: I will present this one period project as a challenge to students to conduct an analysis of the “A” book shelf project and their ability to quickly solve the ten questions asked on page 51.
2. My first hook will be for students to realize they will probably build bookshelves in their first apartment due to limited funds and will need math skills to figure out the details of how to build shelves.
3. My second hook will focus on the opportunity for students to address standardized types of math questions that students must pass to graduate, such as Montana’s CRT or Idaho’s ISAT. My point will be that students need practice reading and comprehending what the problem is asking for and quickly determine a solution strategy and its solution.
4. I will give a quick five minute overview of the “A” shelf project with a diagram on the board and give a feel for what the problems will be like.
8. Next, I will explain that after students have worked out solutions to the questions the project needs to be in a well organized and easy to read one-page summary. Also, accuracy of the answers will be emphasized and will be factored into the grade.
9. Students will have about 40 minutes to work individually on the project and turn it in at the end of the period.
10. I will be monitoring the students’ progress during the period by walking around the classroom.

Assessment: Students will be assessed on the students’ ability to correctly solve the ten problems presented with the “A” book shelf project. Second, students will be assessed on their ability to organize and present their detailed solutions to the questions in a one page project format.

Differentiation: I will be going around the classroom and monitor students' progress during the period. I will provide "minor" assistance to students who seem to be struggling with the math portion. Also, I will be providing encouragement and motivation to students who are struggling with the comprehension and analysis of the project. Finally, I will "allow" students who finish early to informally work together with students who need some help or to cross check answers. This helps reinforce to students that helping each other out is part of what life is all about.

Assignment 8

Teacher: Jim McCue
Class: Algebra I
Date: October 22, 2006

Grade Level: 11/12
Noise Level: Moderate
Unit #: 2 Lesson #: 4

Strategy: Inquiry/Investigation

Topic: Using a Table to Solve an Equation—Investigating the Key Chain Business

Standards: NCTM Standards—Measurement, Problem Solving, Reasoning, Representation and Communication.

Objective: Students will work on page 96 of the Algebra I book and investigate a key chain business that has fixed and variable costs contained in a table that form a cost function/line and an income function based on how many chains are sold. Students will learn how to determine the break-even point where the total revenue minus the total costs equals zero, by writing linear functions and graphing them.

Procedures:

1. Introduction: I will present this one period project as a challenge to students to investigate how to write linear functions for a business and determine the “break-even point”.
2. My first hook will be for students to realize linear functions are used in business and are based on the equation of a line: $y = mx + b$.
3. My second hook will focus on students seeing how the cost function is created for a business, along with the revenue function using the key chain business described in the blue investigation box in the textbook.
4. I will give the students about 25 minutes to complete the table and then graph each data point generated from the table. The first column, named “key chains,” will be the domain or input variable, while the next two columns will be the ranges for cost and revenue.
5. After students have completed their table and graph, we will investigate what it means when the two functions or lines intersect. This is the break-even point.
6. Last, I will have students predict what the profit function will be for 200 keys sold. Profit equals the total revenue for a specific amount of keys sold minus the associated cost. I will emphasize how important these three functions are to a business, big or small, and how students can use this algebra tool to help them in their lives as an adult.
7. If time permits, I will ask students how they could use this analysis tool. Perhaps they could help parents who own a small business or use it to determine if a business proposal they might consider is a good idea based on the break-even point.
8. I will be monitoring the students’ progress by walking around the classroom.

Assessment: Students will be assessed on their ability to answer various questions asked by me during the lesson and how well they perform the investigation. The exercise will be turned in as homework.

Differentiation: I will be going around the classroom and monitor students’ progress during the period. I will provide “minor” assistance to students who seem to be struggling with the math portion.

Assignment 9

Teacher: Jim McCue
Class: Algebra I/II
Date: October 29, 2006

Grade Level: 11/12
Noise Level: Moderate
Unit: #: 1st Quarter Project

Strategy: Project

Topic: Applied Math Project: Evaluate a Firewood Business Venture

Standards: NCTM Standards:

- **Algebra:** Understand patterns, relations and functions, Use math models to represent and understand quantitative relationships.
- **Problem Solving:** Solve problems that arise in mathematics and in other contexts, apply and adapt a variety of appropriate strategies to solve problems.
- **Representation:** Use representations to model and interpret physical, social and mathematical phenomena.
- **Communication:** Communicate mathematical thinking coherently and clearly to peers, teachers and others.

Objective: Students will complete their first quarter applied math project by determining if a firewood summer business would be profitable for them and a partner to enter. Students will determine the “break-even” point where the number of cords of wood sold covers the cost of producing by using linear functions to produce line graphs. Next, students will determine the total profit made, by calculating the total revenue minus the total costs. Third, students will write an analysis of whether it would be a good business venture to enter, by comparing their findings to how much they could make at a summer job.

Procedures:

1. Introduction: I will present this project on a Friday and give the students a full week to complete it. I will outline on the board the details of what the business venture is (selling firewood during the summer) and explain the three items they need to produce for the 4 to 5 page report as described in the objective.
2. Hook: I will explain how linear functions are used in the business world to determine a business’ income function and cost function. Next, I will explain where the two lines cross is known as the “break-even” point and identifies where a business begins to make a profit. For the firewood business, the following information is given:
 - a. Business will last for 12 weeks, working five days a week and selling one cord of wood per day for \$125.
 - b. Start-up costs include: \$100/week to rent a truck, \$10/week to rent a log splitter and \$500 to buy a chain saw. Also, \$20 per delivery is need for gasoline.
3. From this information, students will be shown how to determine the income function and the cost function and how to graph them on paper to determine the break-even point. Also,

students will be required to verify their results by using algebra to set the two functions equal to each other and solving for X (number of cords of wood sold).

4. During the week, portions of the class period will be used to guide students through this project and explain more items, such as how to determine profits and what to compare it to.
5. For the analysis writing portion of the project, I will discuss during class the importance of determining if a business will make a profit and how much *before* you enter into it. We will also talk about how doing so can help them avoid working all summer and making no money. Next, I will challenge students to compare how much they would make at a minimum wage summer job compared to the profit they would make from selling firewood. Finally, I will propose that they use their functions to predict what their income, costs and profits would be if they doubled their output, looking both at how much they would make with their partners and individually.
6. On the Friday before the due date, I will explain the format of the report and how important it is to be well organized, neat and accurate, since this could be used as part of a financial business plan. I've previously explained that the students might need to borrow money for the starts-up costs and the need to show how they will repay the loan.
7. On the Monday due date, we will discuss the project and what students learned from using math as a tool to help them make business decisions and ask how many would consider applying a "break-even" analysis in their future.

Assessment: Students will be assessed on their ability to produce the report with accurate answers to the various questions proposed, along with how well the report is labeled, neat and organized.

Differentiation: I will be going around the classroom and monitoring students' progress during the week when we are working on the project. I will provide "minor" assistance to students who seem to be struggling and give guidance on the specific task they are working on.

Assignment 10

Teacher: Jim McCue
Class: Algebra II
Date: November 05, 2006

Grade Level: 11/12
Noise Level: Moderate
Unit: # 2 **Lesson 2.1-4 review**

Strategy: **Review**
Topic: **Graphing and Using Equations of a Line 2.1 to 2.4 Review**
Standards: NCTM Standards:

- **Algebra:** Understand patterns, relations and functions, Use math models to represent and understand quantitative relationships.
- **Problem Solving:** Solve problems that arise in mathematics and in other contexts, apply and adapt a variety of appropriate strategies to solve problems.

Objective: Conduct a two day review to prepare students for a quiz covering the following sections from Chapter 2 Linear Relationships and Functions:

- 2.1 Relations and Functions
- 2.2 Linear Equations
- 2.3 Direct Variation
- 2.4 Using Linear Models

My strategy will be to assign homework review problems from the end of the chapter in two groups and then give an in-class “Pre-Quiz”. We will conduct in-class group review of the assigned problems and pre-quiz.

Procedures:

1. **Introduction:** I will present this review of sections 2.1 thru 2.4 as individual and group effort to best prepare the students in understanding and correctly solving the line equations from these sections covered in the quiz. I will be explaining that we will not have an extra credit quiz, due to time constraints of the first quarter coming to an end this Friday.
2. **Hook:** I will explain that as a group we can cover the material that will be on the quiz. Further, I will emphasize that everyone can obtain good scores with individual effort and taking responsibility to focus and study and learn how to do the associated problems with the material covered in sections 2.1 thru 2.4.
3. **Schedule:**
 - **Monday:** Wrap up section 2.4 homework problems and assign the even numbered problems from the review section at the end of Chapter Two. Emphasis will be for the students to make sure they truly can do the problems on their own and flag problems that they are having trouble with.

- Tuesday: Conduct a group review of the odd numbered problems, with students coming up to the board to show their solutions along with verbal explanations of the problems. I will be explaining key points and techniques to emphasize what is important to know, such as the four linear equations and what each one will allow you to solve for. An example is the point-slope linear equation: $y=mx+b$ where $m=$ slope and $b=$ Y-intercept and how to graph lines from this formula.
 - Wednesday: I will present an in class “Pre-Quiz” on the board for students to complete accurately. This will consist of twelve key problems from the material that will be on the quiz for Thursday. Students will be given about twenty minutes to complete and we will as a class go over the answers and techniques with me again providing important points on solving problems and when to use what formula to get correct answers. Homework for tonight will be for students to spend one hour studying and reviewing for the quiz by redoing problems from their homework and review session.
 - Thursday: I will give the students about 5 to 10 minutes to ask any last minute questions about the problems and provide answers. The rest of the period will be for the quiz with students having plenty of time to finish.
4. On the following Monday, I will give the students back the results from the quiz and go over the answers to the problems and have students put solutions on the board for a final look at the quiz.

Assessment: Students will be assessed on their ability to produce correct answers and showing the correct steps in solving the problems on the quiz. Also, during the review period, I will be asking intense questions to the students to determine where they are having trouble performing the problems.

Differentiation: I will provide after school tutoring sessions for students who need extra one-on-one time to help them gain confidence and understanding on solving the problems on the quiz.

Assignment 11

Outline of an Assessment System for Jim McCue's Math Class:

I. Preparing Assessments:

- Use of five category criterion referenced grading system based on following grading scale:
 - A – 90%
 - B – 80%
 - C – 70%
 - D – 60%
 - F – below 60%
- Five categories and their weighted average are as follows:
 - Tests : 50%
 - Homework: 25%
 - Classwork: 10%
 - Notebooks: 10%
 - Projects: 5%
- Final grade is determined by the following formula:
 - $FG = \{(test\ ave \times .50) + (homework\ ave \times .25) + (classwork\ ave \times .10) + (notebook\ ave \times .10) + (project\ ave \times .05)\}$
- The assessment system is explained to students and parents at the beginning of the school year.

II. Assessment Instruments:

- Tests and Quizzes.
- Turned in homework assignments to track progress of math skill development.
- Class participation and performance evaluation.
- Review of student's math notebook development every marking period.
- Submission of student's projects using a rubric for grading guidelines.

III. Feedback & Reinforcement:

- Importance of learning new math skills is continuously reinforced by teacher to motivate students to perform their best.

- Teacher will provide informal feedback to students when needed to improve their performance as needed through-out the school year.
- Positive encouragement will always be given and strong words of encouragement when students show signs of lackluster performance.
- Open lines of communications with parents are maintained to provide student's progress so parents are aware of latest progress of students.

IV. Monitoring Student Progress:

- Teacher will keep close tabs on student's progress via daily class participation and homework assignments performance and test scores.
- If students begin to show signs of struggling with material, teacher will have discussions with students to determine what the cause is.
- Also, teacher will provide extra assistance to help students understand new material and not fall behind the class.

V. Reporting Student Achievement:

- Use of Web based electronic grade book with access for both students and parents.
- Grade book will maintain a continuous update of each student's grade to date based on the latest scores inputted.
- Guidance Counselor and Principal have 24 hour access to grade book to monitor student's progress.
- Communications with parents via:
 - Telephone conversations
 - Email messages
 - Parent/Teacher meetings
 - Conversations with students during marking period when grades are given out.
 - Grades are formally sent out by mail to parents

VI. Alternate Assessment:

- Use only for special cases such as students with IEP's to match their special needs.
- Consideration for alternate assessment will be given to individual students on an "as needed" basis.