

Course Title: Multiplication and Division Concepts, Grades 4-5

Instructor's Name: Dave Youngs, AIMS Education Foundation

Course Number: MAT 949

Number of Credit Units: 3 semester units

Course Description:

This course seeks to build a foundation for teaching and understanding multiplication and division concepts. It is supported by classroom lessons written and compiled within the *AIMS* publication *Marvelous Multiplication and Dazzling Division*, which forms the nucleus of the course. Alignment of State and National Standards to the Learning Goals is also an integral part of this course.

The book itself contains hands-on experiences designed to build the necessary foundation for developing meaning and understanding of multiplication and division through

1. Building a strong sense of place value at the concrete and representational stages
2. Developing meaning for multiplication and division at the concrete and representational stages
3. Constructing an understanding of multiplication and division using models and algorithms
4. Exploring historical connections and alternate ways of multiplying and dividing
5. Utilizing multiplication and division in the context of problem solving
6. Engaging in playful intelligent practice with basic multiplication and division with a focus on 100 percent mastery

Primary Learning Outcomes

Students will:

1. Participate opportunities for implementation and sustained use of hands-on experiences in mathematics in a classroom setting
2. Engage in reflective practice through the use of instructional planning, focused questions, and reflective responses
3. Make opportunity for conceptual understanding by showing alignment of instructional experiences with national reform documents and state content standards for mathematics
4. Develop positive attitudes and confidence in teaching and learning
5. Expand their knowledge base of mathematics education
6. Will make connections to professional literature regarding content, theory and practice
7. Will identify State or National Standards that apply to the selected AIMS activities by aligning learning goals with State or National Content Standards

Course Materials

AIMS Book – *Marvelous Multiplication & Dazzling Division*

Manipulatives for one class to be used with lessons from text.

Base Ten Blocks

2 cm Area Tiles

An Overview of AIMS (online- PDFs;

<http://www.aimsedu.org/downloads/pdf/download.php?file=sps.pdf>)

with required reading and application of ideas from the following:

A Model of Learning

The Skills for Thinking

(If Internet is not available to download the pdfs, AIMS can mail copies of these pages. Please email spscourses@AIMSedu.org or call 1-888-733-2467 ext 120 to request copies.)

Focus questions and guidelines for responses based on understanding and application of materials and ideas.

Overall plan for Implementation during half of a school year.

Summary of Alignment with State Content Standards

Application of the Model of Mathematics

Application of Thinking Skills and Alignment with Standards and Learning Goals

Reflective Response and Focus Questions

Integrated Curriculum Form

Professional Growth and Reflection: A Response to Articles and Experience

Course Requirements/Schedule of Topics and Assignments

Option A - With a Classroom of Students

1. Read completely the related *AIMS* publication, *Marvelous Multiplication and Dazzling Division*.
2. Read the selected articles in **An Overview of AIMS** (online- PDFs; <http://www.aimsedu.org/downloads/pdf/download.php?file=sps.pdf>) with required reading and application of ideas from the following:
A Model of Learning
The Skills for Thinking
(If Internet is not available to download the pdfs, AIMS can mail copies of these pages. Please email spscourses@AIMSedu.org or call 1-888-733-2467 ext 120 to request copies.)
3. Design a plan for implementation of ten (10) experiences from *Marvelous Multiplication and Dazzling Division* including a summary of and rationale for the selection of *AIMS* lessons.
4. Choose one lesson from *Marvelous Multiplication and Dazzling Division* and describe how it addresses the four learning environments of the **Model of Mathematics/Learning**.

5. Prior to teaching each lesson, apply the *Skills for Thinking* to the design of tasks and discussion questions reflecting important concepts, skills and processes integral to each lesson. Record these on pages labeled **Applying Thinking Skills**. Also record the Learning Goal and appropriate State Standards on pages labeled Applying Thinking Skills.
6. Implement ten (10) lessons in the classroom with students over a three to four week period.
7. After each lesson, reflect upon your teaching by responding to the Reflective Response focus questions.
8. Show summary of alignment of learning goals with **State Content Standards**. Content Standards for each state may be found at this Web-site address: US Department of Education has links to the state department of education for each state.
http://wdcrocolp01.ed.gov/Programs/EROD/org_list.cfm?category_ID=SEA
9. Complete a **Professional Growth and Reflection** form describing how the selected articles (see number 2 above) and the teaching experience impacted you and your teaching.

Method of Assessment

Provide evidence of the design, implementation, evaluation and reflection of the collective experiences by returning the completed assignments.

Unless otherwise indicated, students **successfully** completing this course will earn a Credit/No credit grade or where a letter grade is requested by checking the appropriate box on the Fresno Pacific University grade form, a letter grade of B will be issued. [Credit is equivalent to a letter grade of B.] In order to earn a letter grade of A, additional work beyond what is described will be required

Additional requirement for an earned letter grade of A

Develop an assessment plan focusing on multiplication **or** division. The assessment plan must address all five areas of the AIMS Skills for Thinking and the four Habits of Mind. Submit completed assessment plan for evaluation.

The discernment between an A or a B is at the discretion of the instructor of record based on the quality of the evidence submitted.

Option B - Without a Classroom of Students

1. Students will read completely the related *AIMS* publication, *Marvelous Multiplication and Dazzling* Division.
2. Students will read the selected articles in **An Overview of AIMS** (online- PDFs; <http://www.aimsedu.org/downloads/pdf/download.php?file=sps.pdf>) with required reading and application of ideas from the following:
A Model of Learning
The Skills for Thinking
(If Internet is not available to download the pdfs, AIMS can mail copies of these pages. Please email spscourses@AIMSedu.org or call 1-888-733-2467 ext 120 to request copies.)

3. Design a plan for implementation of ALL experiences from *Marvelous Multiplication and Dazzling Division* including a summary of and rationale for the teaching of these experiences.
4. Choose one lesson from *Marvelous Multiplication and Dazzling Division* and describe how it addresses the four learning environments of the **Model of Mathematics/Learning**.
5. Apply the *Skills for Thinking* to the design of tasks and discussion questions reflecting important concepts, skills and processes integral to each lesson. Students will record these on pages labeled **Applying Thinking Skills**. Students will also record the Learning Goal and appropriate State Standards on pages labeled Applying Thinking Skills.
6. Show summary of alignment of learning goals with **State Content Standards**. Content Standards for each state may be found at this Web-site address: US Department of Education has links to the state department of education for each state.
http://wdcrobcolp01.ed.gov/Programs/EROD/org_list.cfm?category_ID=SEA
7. Select 8 - 10 AIMS activities to integrate into the Language Arts/Reading, Science, or Social Studies curriculum. Design a plan including your rationale for your selection of activities and how you are going to connect these activities with other subject areas.
8. Complete a **Professional Growth and Reflection** form describing how the selected articles (see number 2 above) and the AIMS investigations **will** impact your teaching.

Method of Assessment

Provide evidence of the design, implementation, evaluation and reflection of the collective experiences by returning the completed assignments.

Unless otherwise indicated, students **successfully** completing this course will earn a Credit/No credit grade or where a letter grade is requested by checking the appropriate box on the Fresno Pacific University grade form, a letter grade of B will be issued. [Credit is equivalent to a letter grade of B.] In order to earn a letter grade of A, additional work beyond what is described will be required

Additional requirement for an earned letter grade of A

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The discernment between an A or a B is at the discretion of the instructor of record based on the quality of the evidence submitted.

University Policy on Plagiarism

All people participating in the educational process at Fresno Pacific University are expected to pursue honesty and integrity in all aspects of their academic work. Academic dishonesty, including plagiarism, will be handled according to the procedures set forth on page 8 of the Fresno Pacific University Catalogue.