

Course Title: Exploring Magnet Concepts: *Mostly Magnets*, grades 2-8

Instructor's Name: Dave Youngs, AIMS Education Foundation

Course Number: SCI 945

Number of Credit Units: 3 semester units

Course Content/Description:

This course seeks to provide a foundation for teaching and understanding basic magnetic concepts. An important theme is magnetic interaction which takes place either between the magnetic fields of two magnets or between a magnet and a material such as soft iron in which a magnetic field can be induced. The source of the activities is the AIMS publication *Mostly Magnets*.

Primary Learning Outcomes

Students will:

1. Participate in opportunities for implementation and sustained use of hands-on science experiences in a classroom setting
2. Engage in reflective practice through the use of instructional planning, focused questions, and reflective responses
3. Make connections for conceptual understanding by showing alignment of instructional experiences with national reform documents and state content standards for science and mathematics
4. Develop positive attitudes and confidence in teaching and learning
5. Expand their knowledge base of science 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 – *Mostly Magnets*

AIMS Magnet Lab

25 Ring Magnets

1 Cow Magnets

1 Magnetic Field Viewers

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 within a four to six week period
- Application of the Model of Mathematics
- Application of Thinking Skills and Alignment with Standards and Learning Goals
- Reflective Response and Focus Questions
- Professional Growth and Reflection: A Response to Articles and Experience
- Summary of Alignment with State Content Standards

Course Requirements/Schedule of Topics and Assignments

Option A with a Classroom of Students

Text: *Mostly Magnets*

Read the following 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

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1. Design a plan for implementation of eight (8) experiences from *Mostly Magnets* including a summary of and rationale for the selection of AIMS lessons.
2. Choose one lesson from *Mostly Magnets* and describe how it addresses the four learning environments of the *Model of Learning*.
3. Implement eight (8) activities with students in the classroom.
4. Prior to teaching each lesson, apply the ***Skills for Thinking*** to the design of discussion questions reflecting important concepts, skills and processes integral to each lesson. Record these questions, as well as the learning goal and appropriate state content standard(s), on pages labeled **Applying Thinking Skills**.
5. After each lesson, reflect upon your teaching by responding to the Reflective Response focus questions.
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. Complete the *Professional Growth and Reflection* form, describing how the selected theory articles and the teaching experiences have impacted you and your teaching.
8. Complete the Summary of Alignment with State Content Standards.

Method of Assessment:

1. Provide evidence of the design, implementation, evaluation and reflection of the collective experiences by returning the completed assignments.
2. Unless otherwise indicated, students successfully completing this course will earn a Credit/No Credit grade. If a letter grade is requested on the Fresno Pacific University grade form, a letter grade of B will be issued. 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

1. Adapt, modify, or use one of the investigations in the book as a final performance assessment of understanding of magnetic concepts.
2. Submit a summary of how the activity was used and/or modified explaining the rationale for using the activity in this way.
3. Include at least four examples of student work on the final performance assessment, which demonstrate the variety of student successes.

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.

**Course Requirements/Schedule of Topics and Assignments
Option B without a Classroom of Students**

Text: *Mostly Magnets*

Read the following 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.)

1. Design a plan for implementation of eight (8) experiences from *Mostly Magnets* including a timeline and a summary of and rationale for the selection of AIMS lessons.
2. Choose one lesson from *Mostly Magnets* and describe how it addresses the four learning environments of the *Model of Learning*.
3. Apply the **Skills for Thinking** to the design of discussion questions reflecting important concepts, skills and processes integral to each lesson. Record these questions, as well as the learning goal and appropriate state content standard(s), on pages labeled **Applying Thinking Skills**.
4. 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

5. 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.
6. Complete the *Professional Growth and Reflection* form, describing how the selected theory articles and AIMS investigations **will** impact you and your teaching.
7. Complete the Summary of Alignment with State Content Standards.

Method of Assessment:

1. Provide evidence of the design, implementation, evaluation and reflection of the collective experiences by returning the completed assignments.
2. Unless otherwise indicated, students successfully completing this course will earn a Credit/No Credit grade. If a letter grade is requested on the Fresno Pacific University grade form, a letter grade of B will be issued. 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

1. Develop a plan to adapt, modify, or use one of the investigations in the book as a final performance assessment of understanding of magnetic concepts.
2. Submit a summary of how the activity will be used and/or modified explaining the rationale for using the activity in this way.

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.