

Title

Math in Everyday Life for Grades 6-8

Target Audience

This course is intended for grades 6-8 pre-service and in-service teachers.

Course Description

This course provides educators with new ways to teach the concepts of problem solving to middle school students. Learners will explore Web-based technologies to generate resources for students to use as they explore problem-solving concepts. Learners will study the NCTM standards for teaching problem solving and practice applying these standards to their teachings. As a final task, learners will create a lesson plan or lesson plan that uses technology and real world activities to teach problem solving in accordance with the NCTM standards.

Instructor / Facilitator

See instructor/facilitator sheet

Credits

TBA

Objectives

Learners will:

- Integrate into lesson planning the NCTM standards for teaching problem solving.
- Apply knowledge of lesson planning to connect real world problem solving activities and technology into a lesson plan.
- Use software and Web-based interactive activities to generate resources for students to use as they explore problem-solving concepts.
- Incorporate Internet resources to enhance students' knowledge of problem solving concepts.
- Apply knowledge of NCTM standards and lesson planning in the creation and field-testing of a lesson plan that integrates technology into problem solving and real world activities.

Outline of Content and Assignments

A summary of course content and assignments is outlined below. Details for each assignment, including locations of readings and complimentary Web resources, are included in each part of the Course Content.

Session 1: The Importance of Problem Solving

Learners will:

- Define their professional goals and expectations for this course in the online journal.
- Explain their prior knowledge and experiences about using technology and real-world activities to teach problem solving.
- Discuss how asking questions about information in problems fosters problem-solving abilities in students.

Read

- “Problem Solving Standard for Grades 6-8,” from *Principles and Standards for School Mathematics*
- “Asking Questions in Probability Class”

Write in online journal

- Reflect on expectations for the course.
- Reflect on prior experiences teaching mathematics to students this age, including any prior experiences using technology and real-world activities to teach problem solving.

Participate in an online discussion

- Introduce themselves to other learners.
- Respond to the question: Do you think that asking questions about information in problems, as Lee-Chua suggests, will enhance your students' problem solving abilities?
- Share a version of a given word problem following the versions as outlined by Lee-Chua in “Asking Questions in Probability Class”.

Complete assignments and activities

- Implement different versions of word problems with students following the examples and process described by Lee-Chua. (optional)

Additional Resources (not required)

- “Grade-by-Grade Learning—5th Grade” from PBS Parents
- “Improving Mathematics Problem Solving Skills for English Language Learners with Learning Disabilities” from Colorín Colorado
- “Reading and Understanding Written Math Problems” from Colorín Colorado
- Cyberchase Web site from PBS Kids

Session 2: Real World Lessons

Learners will:

- Explain the advantages and disadvantages of telling students that there is more than one way to solve problems.

Read

- How to Develop a Lesson Plan
- AskERIC Curriculum Materials

Participate in an online discussion

- Respond to the following: What are the advantages and disadvantages of telling students that there are two ways of doing something before they begin the activity? What examples from your own teaching and learning support the approach you prefer?

Complete assignments and activities

- Review the “Roll Out the Barrel” lesson plan
- Implement the “Roll Out the Barrel” lesson plan with students (optional)

Watch videos

- “Roll out the Barrel” part 1
- “Roll out the Barrel” part 2

Session 3: Cross-Curricular Lessons

Learners will:

- Explain ways to collaborate with other teachers to create cross-curricular activities.

Participate in an online discussion

- Respond to the following: Explain two or three ways that you can collaborate with other teachers to create a cross-curricular activity.

Complete assignments and activities

- Review “The Next Billion” lesson plan
- Implement “The Next Billion” lesson plan with students (optional)
- Review cross curricular lesson plans from PBS

Additional Resources (not required)

- “Teaching Mathematics to Gifted Students in a Mixed-Ability Classroom” by Dana T. Johnson
- “Teaching Mathematics and Science To English Language Learners” from the Northwest Regional Educational Laboratory
- “Math Learning Disabilities” from LD Online
- “Number Sense: Rethinking Arithmetic Instruction for Students with Disabilities” from LD Online
- Math Responses from Misunderstood Minds
- Supporting Your Child: Creating Good Practices from PBS Parents
- Tips to Help Children Develop Positive Math Attitudes from PBS Kids
- Tool Kit for Parents: Tips for Helping with Math Concepts and Homework from LD Online
- Media Infusion Web site from PBS Teachers

Session 4: Calculators in the Classroom

Learners will:

- Discuss the advantages and disadvantages of using calculators in the classroom.

Participate in the online discussion

- Learners discuss the assumption that if students use the calculators for computation, they can spend more time thinking about the complex, larger problems. Learners also discuss their ideas for how they would implement calculators in given lesson plans.

Complete assignments and activities

- Review “Is it Really News?” lesson plan
- Implement and extend the “Is it Really News?” lesson plan with students (optional)

Watch videos

- “Is It Really News?” Part 1
- “Is It Really News?” Part 2

Additional Resources (not required)

- Inspiration® Web site
- Lesson plans from the 108 Stitches: The Physics in Baseball Web site:
 - The Pitch

- Running the Bases
- The Hit
- The Flight

Session 5: Problem Solving and the Internet

Learners will:

- Identify Internet resources that will be useful to teach specific units of the mathematics curriculum.
- Explain the criteria they used to select shared Internet resources.

Read

- “Mathematical Problem Solving: A Journey toward Meaning” from PBS Teachers
- “Evaluating Online Educational Materials for Use in Instruction” from ERIC Digest
- “Tips to Evaluate Internet Resources” from PBS TeacherLine
- “Assessment and Rubric Information” from Kathy Schrock

Participate in the online discussion

- Respond to the following: What sites or resources from your Web search will be particularly useful for you to use with your students? What criteria did you use to come to your conclusions?

Complete assignments and activities

- Complete Web search

Session 6: Final Project

Learners will:

- Apply knowledge of the NCTM standards in the creation and implementation of a lesson plan that integrates technology into problem solving and real world activities.
- Assess their learning in this course by comparing their prior knowledge and acquired knowledge.
- Analyze the learning experience in this course by reflecting about their professional goals and expectations.

Complete Final Project

Learners will

1. Choose one lesson plan that was presented in this course or search the Internet and find one lesson plan that concentrates on developing problem-solving skills that they would like to use with students. The lesson must relate to math in everyday life and include a technology component, such as a computer-based activity or a Web connection.
2. Implement the lesson plan with students.
3. Write a reflection paper (2-3 pages) that discusses their experiences with the lesson they chose. Learners will use the resources and information from this course to support their statements. The paper should include the following components:
 - Describe the lesson.
 - Discuss what worked well.
 - Provide at least two ways they would change the lesson plan the next time they teach it and provide the criteria/bases for these improvements.
 - Discuss the strengths and weaknesses of the use of technology in the lesson.
 - Discuss what they would do differently if they taught this lesson again.
4. Post the lesson plan on the discussion board for this session. In the post, answer the following:
 - What did you learn as you completed your final project?



- Did you find some great new resources on the Internet?
 - Did you discover some new ideas to teach problem solving skills?
 - Did you have some interesting experiences in the classroom?
5. Review at least two other learners' posts and lesson plans. Provide comments and suggestions on their lesson plans using the Lesson Plan Rubric and the Peer Review Guidelines to guide their response.

Schedule

This course is scheduled to take approximately 15 hours to complete.

Requirements

Learners are expected to:

- Complete all assignments and activities
- Participate in discussion boards
- Maintain an online journal

Materials (hardware, software, plug-ins)

Technical Requirements

- Word processor
- Internet service provider
- Email

Academic Dishonesty Policy

To be inserted by university institution only

Evaluation

This course is evaluated on a letter grade basis, and may be available for graduate credit. See graduate credit details pertaining to specific graduate credit institutions.

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