

## 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: Examine the Importance of Problem Solving

Learners will:

Read

- "Problem solving standards for grades 6-8," from *Principles and standards for school mathematics*



- “Asking questions in probability class”

Participate in the online discussion

Upon completion of the readings and assignments, learners will reflect on the importance of problem solving (Part 1).

In a Discussion Board forum, learners will explain how to apply a lesson and provide at least one modification, based on NCTM standards. Learners will also share their preferred site and provide supporting comments. After posting responses, learners will follow the Discussion Board to reflect upon classmate observations.

### Session 2: Review and Reflect on a Real World Lesson

Learners will:

Review lesson plan design

- How to Develop a Lesson Plan
- The Educator’s Reference Desk

Review lesson plan

- Roll Out the Barrel

Watch videos

- “Roll out the barrel,” part 1
- “Roll out the barrel,” part 2

Explore computer activities

- Microsoft Excel
- AppleWorks
- Spreadsheets in the Classroom
- Hyperstudio
- MPOWER
- Power Point

Participate in the online discussion

- Upon completion of the readings and assignments, learners will review and reflect on applying problem solving techniques to real world lessons (Session 2).
- Learners will review lessons about teaching problem solving skills and apply them to a computer-based activity. Learners will also choose one of the computer-based activities in Session 2 and explain how they would present it to students. Learners will then be asked to determine questions to stimulate students' thinking about problem solving. Finally, learners will interact on the Discussion Board to read and comment on classmate opinions.

### Session 3: Review and Reflect on a Real World Lesson

Learners will:

Read

- “The Next billion”

Explore Web-based activities and resources

- United Nations World Population page

Participate in the online discussion

Upon completion of the readings and assignments, learners will reflect on applying problem-solving skills to real world applications (Session 3).

Maintain an online journal

Learners will discuss and post general feelings, potential problems, and solutions on introducing Internet activities in the classroom. Learners will also check the Discussion Board to read and provide feedback on classmate opinions.

## Session 4: Use the Web to Locate Curriculum Ideas

Learners will:

Review lesson plan

- Is it Really News?

Watch videos

- "Is It Really News?," Part 1
- "Is It Really News?," Part 2

Review activity

- Inspiration

Participate in the online discussion

Upon completion of the readings and assignments, learners will reflect on using Internet resources for curriculum ideas (Session 4).

Maintain an online journal

Learners will discuss and post general feelings, potential problems, and solutions on introducing Internet activities in the classroom. Learners will also check the Discussion Board to read and provide feedback on classmate opinions.

## Session 5: Locate and Evaluate Related Web Resources and Lesson Plans

Learners will:

Review lesson plan design resources

- Assessment and Rubric Information
- Evaluating Online Educational Materials for Use in Instruction

Review and evaluate Internet resources

- Illuminations
- The Math Forum
- Kathy Schrock's Guide for Educators
- The Educator's Reference Desk

Participate in the online discussion

Upon completion of the readings and assignments, learners will reflect on researching Web resources and lesson plans (Session 5).

Maintain an online journal

Learners will discuss and post general feelings, potential problems, and solutions on introducing Internet activities in the classroom. Learners will also check the Discussion Board to read and provide feedback on classmates' opinions.

Final Assignment

**Develop a Lesson Plan**

Throughout this online course, you have had a chance to learn about the NCTM National Standards for problem solving, watch some experienced teachers in action, review Web resources, think about ways to integrate technology into your teaching, and discuss your ideas with other learners. Your final assignment will give you the opportunity to use this knowledge in your classroom.

Choose **one** of the following assignments. When you have finished the written portion of the assignment, submit it to your facilitator.

1. Choose one lesson plan that were presented in this course. Try it with your students. If you choose a lesson plan that does not have a technology component, think of a way that you can integrate technology and incorporate it into the lesson. Write up your lesson plan, using the PBS TeacherLine lesson plan template. Then, write a short reflection paper (2-3 pages) that discusses your experiences with the lesson that you chose. For example:

- Discuss what worked well.
- Provide at least two ways you would change the lesson plan the next time you teach them and provide the criteria/bases for these improvements.
- Discuss the strengths and weaknesses of the use of technology in the lesson.
- Be sure to discuss the reasoning behind your statements and their basis in concepts you explored in this course.
- What would you do differently if you taught these lessons again?
- Submit your reflection paper and lesson plan to your facilitator.

**OR**

2. Search the Internet and find one lesson plan that concentrate on students developing problem-solving skills that you would like to use with your students. Make sure that they all relate to math in everyday life and include a technology component, such as a computer-based activity or a Web connection. Write up your lesson plan, using the PBS TeacherLine lesson plan template. Try the lesson with your students. Then, write a short paper (2-3 pages) that discusses your experiences with the lesson that you chose. For example:

- Discuss what worked well.
- Provide at least two ways you would change the lesson plan the next time you teach them and provide the criteria/bases for these improvements.
- Discuss the strengths and weaknesses of the use of technology in the lesson.
- Be sure to discuss the reasoning behind your statements and their basis in concepts you explored in this course.
- What would you do differently if you taught these lessons again?
- Submit your reflection paper and lesson plan to your facilitator.

**OR**

3. Create your own lesson plan (three or four activities) with a technology component. The lesson plan should focus on problem solving that applies to everyday life situations. To get ideas for your lesson plan, you can use the resources in this course or go use the PBS TeacherSource Web site. Write up your lesson plan, using the PBS TeacherLine lesson plan template: Try out your lesson plan with your students. Write a one-page reflection paper detailing how it worked and describing what you would do to improve the lesson. Include a discussion of the criteria you used for your suggested improvements. Submit your reflection paper and lesson plan to your facilitator.

Reflecting on The Final Project

Talk about it

What did you learn as you completed your final assignment? 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? Go to the Discussion Board and type your answer. If you want, you can copy your final project into your message for other learners to see. Check the Discussion Board to find out and comment on what your classmates have written. Comment on at least two classmates' final projects.

**Schedule**

This course is scheduled to take approximately 15 hours to complete readings, activities, video, assignments, reflections and a final project.

**Requirements**

Learners are expected to:

- Complete all assignments
- Participate in discussion boards
- Maintain an up to date 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**

Pass/fail upon satisfactory assignment completion, active discussion board participation, and regular online journal entries.