

## Title

Math in Everyday Life for Grades K-5

## Target Audience

This course is intended for pre-service and in-service grades K-5 teachers.

## Prerequisites

To participate successfully in this course, learners should be familiar with online courses, or have taken the TeacherLine Practice Learning Online Course. This course also assumes working knowledge of typical elementary-school level math skills.

## Course Description

This course is designed to give elementary-school educators effective ways to enrich their math classrooms with illustrations drawn from the real world. Learners will examine the importance of problem solving, calculators, and the Web in the elementary-school classroom. Online discussion boards allow learners to collaborate with one another and to draw from the personal professional experiences of other fellow educators. Learners will research the pros and cons of calculator use in the classroom. The Council of Teachers of Mathematics (NCTM) has expectations for calculator use and problem solving; learners will review these standards and guidelines so as to have a framework within which to work when designing lesson plans. As a final task, learners will design their own “walking fieldtrip” that integrates problem-solving activities and calculator- or Web-based applications with students’ daily lives.

## Instructor/Facilitator

See the instructor/facilitator sheet

## Credits

To be determined by the offering institution

## Objectives

Learners will:

- Understand National Council of Teachers of Mathematics (NCTM) expectations for student problem-solving and the use of calculators in the classroom.
- Review the importance of problem-solving.
- Explore the effective use of calculators.
- Integrate Web-based problem-solving activities into the classroom.
- Produce and implement a “walking fieldtrip” that integrates problem-solving activities and calculator- or Web-based applications into students’ daily lives.

**Outline of Content and Assignments**

The content area comprises a sequence of five parts, or sessions. Each part includes assignments and discussion questions for participants to complete. The final project for the course is found in Part 5.

**Part 1: Examine NCTM Standards that Promote Problem-Solving**

Learners will:

Read

- "Problem Solving, Principles and Standards for School Mathematics"
- "Problem Solving Standard for PreK-2 Students, Principles and Standards for School Mathematics"
- "Problem Solving Standard for Grade 3-5 Students, Principles and Standards for School Mathematics"
- "Solving Problems in the Real World," Henry O. Pollak

Review the lesson plan

- Money Counts

Participate in the online discussion

After completing the readings, participants will record on the Discussion Board how they relate real-world situations to mathematics instruction and how the NCTM standards help teachers convey the usefulness of math to students. Course participants will also discuss how they determine students' readiness for advanced mathematics courses.

**Part 2: Examine the Use of Problem Solving Skills**

Learners will:

Read

- "What is Contextual Learning?"
- "Contextual Teaching Exchange newsletter"

Watch the videos

- "Money Counts, Videos 1 & 2"

Try a sample problem

- "Math Mysteries: Try a Problem"

Review and evaluate Web sites

- UK Numeracy Hour Site
- Ambleside Primary School Numeracy Site
- Figure This! Math Challenges for Families

Participate in the online discussion

When participants have completed the readings and assignments for this section, they will post on the Discussion Board their solution to the following classroom problem: Many classroom games designed to promote math skills and problem-solving techniques also allow participation in the game to interfere with learning. Participants are to take a game that they currently use to teach these skills and maximize its instructive capacity.

Part 3: Explore the Use of Calculators

Learners will:

Read

- "Calculators and the Education of Youth"
- "The Great Calculator Debate: Concerns About Calculator Use in Elementary Schools," Thomas Cowdery
- "The Role of Calculators in Math Education"

Explore Web sites

- Calculators On-Line Center
- Online Calculator

Participate in an online discussion

After reading the articles and exploring Web sites that provide students experience in using calculators, learners will go to the discussion board and comment on at least two strengths and weaknesses in the arguments presented below. Learners are also to record their opinions and rationale and comment on what other learners have written.

- According to the NCTM's 1998 *Statement on Calculators and the Education of Youth*, "Appropriate instruction that includes calculators can extend students' understanding of mathematics and will allow all students access to rich problem solving experiences."
- Math teacher Thomas Cowdery, on the other hand, is concerned that if calculators are introduced too early in the classroom, "[s]tudents will cease to believe that they are capable of doing arithmetic and accept it as something only done by a machine."

Part 4: Locate and Evaluate Related Web Resources and Lesson Plans

Learners will:

Read

- "Guidelines for Evaluating Web Sites"
- "Evaluating Technology-Based Curriculum Materials"
- "Seven Steps to Responsible Software Selection"

Review lesson plans

- Soak It Up
- Food for Thought

Watch videos

- "Soak It Up," Videos 1 & 2
- "Food for Thought," Videos 1 & 2

Find three or more online lesson plans or Web resources using these sites

- Kathy Schrock's Guide for Educators
- Math Forum
- The Educator's Reference Desk
- The Gateway to Educational Materials

Participate in online discussion

After completing the readings and other activities, learners will post on the Discussion Board three of the most useful resources they found online and the URLs. They will give specific criteria used to choose each resource and state how they would use these resources in units that they teach. Learners will comment on what other learners have posted.

## Part 5: Final Project: Develop Your Own Walking Tour

Learners will:

Complete the following final project:

During this course, participants have explored how real-world activities can teach problem-solving to their students. They have investigated online resources and strategies to integrate the calculator and the Internet into their teaching to further enhance problem-solving lessons.

The final project for this course is to produce and implement a “walking fieldtrip” that integrates problem-solving into students’ daily experience. Participants will generate a list of activities from which the students can choose; these activities must integrate the appropriate NCTM standards, use calculators or Web-based applications, and apply mathematics to real-world scenarios in their community.

The course participant will need to complete the following steps:

- Identify a problem-solving unit to teach that includes a walking fieldtrip
- Identify NCTM and the local standards that the lesson addresses
- Identify technology that is integrated into the lesson
- Create a lesson plan with objectives for learning problem-solving skills
- Implement the lesson plan
- Create a 2- or 3-page paper that describes the implementation of the lesson plan, including what worked well and what you would change if you taught it again
- Provide student work samples and student comments about their learning experience
- Submit your paper, lesson plan, and samples of student work to your facilitator using the Digital Drop Box in the Student Tools area of the course

Participate in online discussion

After completing the final project, participants will go to the Discussion Board and post their lesson and paper, then reflect on each other’s solutions, focusing on suggestions for improvement, remediation, and extension activities.

### **Schedule**

This course is scheduled to take approximately 15-20 hours to complete readings, activities, video, assignments, reflections and a final project.

### **Requirements**

Learners are expected to:

- Complete all assignments
- Participate regularly in discussion boards
- Follow all procedures

### **Evaluation**

Pass/fail upon satisfactory completion of assignments and discussion board participation

**Materials (hardware, software, plug-ins)**

- Word processor
- Internet service provider
- E-mail

**Academic Dishonesty Policy**

To be inserted by university institution only