LESSON 1

What's a Thousand?

Number Sense and Place Value

Objectives . . . Students will be able to:

- *Understand the numeration system by relating, counting, grouping, and using place-value concepts.*
- *Interpret the multiple uses of numbers encountered in the real world.*
- *Develop number sense.*

NCTM Standards and NAEP Strand

Concepts learned and applied in Lesson 1 correlate to NCTM Standards 1, 2, 3, 4, and 6; and NAEP Strand 1 (Number Sense, Properties, and Operations).

Materials List

The Class

- calculators
- base ten material (e.g., base ten blocks, bean sticks, popsicle sticks, unifix cubes, stacking blocks)
- place-value mats
- *Optional:* play money ($1, $5, $10, $20, $50, $100)
- overhead markers/pens

Each Group

- A copy of BLMs 1-C and 1-D for each group.
- *Optional*: A transparency of the recording sheet for each group.

Each Student

- A copy of BLMs 1-A and 1-B for the "You Try It at Home" activities.

To Prepare Your Students

Introduce today's video topic and ask questions designed to ascertain if the students are familiar with the Student Prerequisites and Key Words and Terms. Present some simple examples of the type of problem to be explored—e.g., Can you think of any place where you might see the number 1,000? How many hundreds are there in a thousand? How many tens? . . .

Student Prerequisites

- Grouping by tens, hundreds, and place-value concepts.
- Concept of multiplication and repeated addition.
- Reading, writing, and representing numbers for 1 to 1,000.

Key Words and Terms

ones	*hundreds*
tens	*thousands*

Video Overview

The lesson begins by showing viewers the ways "big" numbers are used in everyday life, e.g., population signs, the weight limit on an elevator, prices of expensive electronic equipment, etc. How often do we see and deal with big numbers in our everyday lives?

Video Lesson

What's a Hundred?

A father and daughter are discussing a trip they will be taking. The father says the trip will cost $100; the daughter asks "How much is $100?" (You may want to pause at this point to review place values—ones, tens, and hundreds.) As the video continues, her father counts out this amount to show her what it looks like.

Ways to Make a Thousand

Sheila Eller of Baker Demonstration School poses the following problem to her class: Given the weights of a basketball player (200 pounds), a student (50 pounds), a dog (25 pounds), and a cat (5 pounds), find as many different ways as you can to load a bus so that it carries exactly 1,000 pounds.

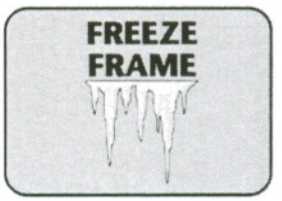
STOP **YOUR CLASS MAY WANT TO TRY THIS NOW**

Divide the class into small working groups. Give each group a copy of BLM 1-C and 1-D. Ensure that each group understands the problem and has an adequate amount of material to assist it in solving the problem. Suggested materials might be: unifix cubes, stacking box, place-value mats and/or a calculator.

Assist the groups as they develop *at least* three solutions but encourage them to come up with as many as they can. After they have worked out the problem, but before they present their solutions, play the video showing how other kids solved the problem.

Play

Watch the ways the children on the video solve the problem. The video then asks:



WERE THESE SOLUTIONS LIKE YOURS?

Note: Question is on-screen but there is no stop sign. Teachers should pause at this point and ask each group to present its solution. Encourage your class to think about all of the solutions and remind them that there are many possible solutions.

Play

100 Kids in the Gym

From a high angle, we watch ten children run into a gym and sit in a row. The narrator asks, "What would 100 children look like?" Ninety more kids run into the gym and sit down. The narrator acts as a cheerleader to ask, "Give me an 81!" and 81 of the kids stand up and wave. The cheerleader says, "Give me a 67!" and 67 of the kids stand up. Finally, the cheerleader says, "Give me a zero!"—and all the kids run out! One girl returns and places a zero card on the floor.

YOUR CLASS MAY WANT TO TALK ABOUT THIS NOW

1. How did the students show 81? How many ways can you think of to show 81?
2. How did the students show 67? How many ways can you think of to show 67?
3. There were 100 students in the gym on the video tape. Do you think our gym could hold 1,000 students? Why or why not? Is there another room in our school that you think would hold about 1,000 students?

Play

In the final segment, we watch as a bank teller begins to count out $1,000 in one dollar bills. A narrator asks, "How long would it take to count to 1,000?" As the teller counts, the video suggests . . .

YOU TRY IT!

Extended Activities

These activities are designed to extend the mathematics learning introduced in this lesson.

1. Have the students predict, then determine which weighs more:

1,000 pennies or 1,000 M&M's (plain or peanuts)

1,000 sheets of paper or a 1,000-page dictionary

2. Have the students predict, then determine the length of:

1,000 paper clips

1,000 unifix cubes

3. Have them predict, then determine the size and shape of a container needed to hold:

1,000 drops (use an eyedropper)

1,000 M&M's (plain and/or peanut)

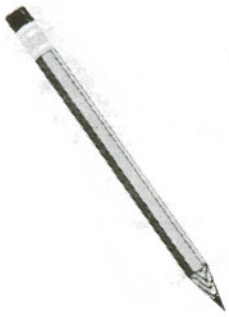
1,000 trading cards

1,000 pogs

1,000 unifix cubes

1,000 buttons

Cross-curricular Activities



1. (For this activity, you may wish to collect some catalogues or advertisements from your local paper.) Pose the following problems to small groups of students.

Could you spend $100 in a grocery store? $1,000? List the things you would buy.

Could you spend $100 in a toy store? $1,000? List the things you would buy.

Could you spend $100 in an electronics store? $1,000? List the things you would buy.

Could you spend $100 in a sporting-goods store? $1,000? List the things you would buy.

Then have your students make a list of stores in which it is easier to spend $100 than $1,000, and vice versa.

2. Where in your community are you likely to find 100 people? 1,000 people?

Writing Activity

Write a story about a collection of 1,000 things. What might the things be? What might happen with them?

You Try It At Home

Two handout masters, numbered 1-A and 1-B, are provided in a booklet accompanying the Teacher's Guide; reproduce as many of these as you need. Reduced examples are also provided at the end of this lesson. These activities are designed to extend and reinforce concepts taught in the lesson, and to enable parents or other caregivers to become more involved with students' mathematics learning.

Assessment and Criteria for Scoring

The following five proficiency categories may be used to evaluate student performance in response to Lesson 1. You may use these evaluation categories to assess student classroom performance and extended activity performance.

The problem: Students are asked to calculate how to load exactly 1,000 pounds on a bus using units of 200, 50, 25, and 5 pounds, and provide multiple solutions.

Advanced Response: The response includes more than four different ways to make 1,000 pounds. The mathematics is correct, the work is complete, and the explanation is clearly presented.

Proficient Response: The response includes four different ways to make 1,000 pounds. The mathematics is correct, the work is complete, and the explanation is clearly presented.

Nearly Proficient Response: The response includes three different ways to make 1,000 pounds. The mathematics is correct in most respects, although there may be minor errors. The work is generally complete, and the explanation is reasonably clear.

Minimal Response: The response includes two different ways to make 1,000 pounds. The mathematics is correct in most respects, although there may be minor errors. The explanation may also be flawed.

Attempted Response: The response is characterized by at least one of the following:

- There is only one way presented to make 1,000 pounds.
- The mathematics is seriously flawed or incomplete.
- The presentation is unclear or inaccurate.

References and Resources

National Council of Teachers of Mathematics (1989) Curriculum and Evaluation Standards for School Mathematics. Reston, VA: The Council.
Standard 1 : Mathematics as Problem Solving.
Standard 2 : Mathematics as Communication.
Standard 3 : Mathematics as Reasoning.
Standard 4 : Mathematical Connections.
Standard 6 : Number Sense and Numeration.
NAEP Strand 1 (Number Sense, Properties, and Operations).

Suggested Children's Literature

Aileen Friedman, *The King's Commissioners*
David Schwartz, *How Much Is a Million?*
David Schwartz, *If You Made a Million*
Patricia M. McKissack, *A Million Fish . . . More or Less*
Elinor J. Pinczes, *100 Hungry Ants*
Eleanor Coerr, *Sadako*

You Try It At Home 1 and 2

Making Cents of Pennies

Think about cents . . . . Find ways to show 100 cents (or 1,000 cents) using pennies, nickels, dimes, quarters, and half-dollars. Ask an adult at home or other care-giver to help you, and record your results below.

Charting the Minutes

Keep a chart over a period of a week of the time you spend in some favorite activities: reading, writing, running, practicing a musical instrument, etc. Ask an adult at home or other care-giver to help you, and record the results below.