



Overview

Students will work in cooperative groups to solve a real-world problem: comparing overdue fines at different libraries.

Grade Levels: 4–6




Concepts

- Multiplication
- Problem solving



Materials

-  TI-15 Explorer™ calculators
- “Overdues” from *A Light in the Attic*
Silverstein, Shel (New York: NY, Harper and Row, 1981)
- Chart paper
- Markers
- Paper, pencils
- Student activity sheet



Assessment

Throughout the activities, questions are included for formative assessment. Student work samples should be used as a check for understanding. Have the students use the TI-15 to show their calculations.



Introduction

Read to students the poem “Overdues” by Shel Silverstein. Discuss overdue fines with them and how they are calculated per day. Ask the students:

- *If the library only charged a penny a day, how much do you suppose the fine will be?*
- *How can you find out?*

Presenting the Problem

1. Review the four steps of problem solving with the students:
 - understanding the problem
 - making a plan
 - carrying out the plan
 - evaluating the solution
2. Have the students read the *Problem* page and paraphrase the problem. Make sure the students are clear on what the problem asks.
3. Discuss with students the information on the *Problem* page. Make sure they understand the information on the chart. Help them determine how they can find the same information about their own library.
4. If groups have difficulty with the problem, use the *Things to Consider* page. This page provided guiding questions to help the students complete the problem-solving steps.
5. In the presentation, students should show a completed display. The display should include a graph with all appropriate labels.



Evaluating the Results

1. After the presentations are made, have students examine the various solutions presented.

Questions for Students:

- ❖ *How are the presentations similar?*
- ❖ *How are the presentations different?*

2. Ask them to compare the numbers used.

Questions for Students:

- ❖ *Did all groups use the same numbers?*
- ❖ *Why do you think this is so?*

3. Ask them to determine the reasonableness of the results.

Questions for Students:

- ❖ *Did each group answer the question?*
- ❖ *Do the numbers used make sense?*
- ❖ *Did all of the groups consider all of the variables?*

Additional Information

The web sites for the libraries are as follows:

Boston Public Library	bpl.org
Boulder Public Library	boulderlibrary.org
Calgary Public Library	calgarylibrary.ca
Pelham Public Library	pelhamlibrary.org
Seattle Public Library	spl.org



SOLUTIONS



Name _____

Date _____

Overdue Fines



Focus: Use basic operations to determine the cost of overdue library book fines in different cities.

The Problem: How much would overdue fines be in different cities?

In the first part of the activity, teams will create a poster showing the amount of overdue fines various libraries charge a borrower for overdue books. Team members will explain how they calculated the total amount of the fines. Answers will vary based on the explanations.



Using the Calculator

Basic Operations

Use the TI-15 calculator to solve the problems:

- 1 Bill, Roland, and Refugio all collect baseball cards. Bill has 73 cards, Roland has 125 cards, and Refugio has 209 cards. How many cards do they have together?

Press	The display shows:
73 $+$ 125 $+$ 209 Enter	Answer: 297

How do you know your answer is correct?

Possible answer: I also added using paper and pencil and compared the sums.



- 2** Alicia has 182 baseball cards. She gives 39 cards to Refugio. How many cards does she have now?

Press	The display shows:
182 \square 39 \square \square	Answer: 143

How do you know your answer is correct?

Possible answer: I also subtracted using paper and pencil and compared the answers.

- 3** Danyel's Explorer troop is going on a camp out. They are taking 17 tents. Each tent needs 9 stakes. How many stakes should Danyel pack?

Press	The display shows:
17 \square 9 \square \square	Answer: 153

How do you know your answer is correct?



Possible answer: I added to find the sum and compared with the product from the multiplication.

- 4** Tommy is packing teddy bears for the Handy Dandy Toy Company. He has 235 teddy bears to pack. Each box holds 8 teddy bears. How many full boxes will he have when he is finished packing? Will he have any bears left over? How do you know?


Press	The display shows:
235 \square 8 \square \square	Answer: 29r3



How many full boxes does that make? What happens to the remainder?

Press	The display shows:
235  8 	Answer: 29.375

Answer: There are 29 full boxes. The remainder is put in another box that is partially filled.

How is this different from using the  key? What happens to the remainder?

Answer: The answer is given with the remainder as a decimal. In the question above the remainder was shown as 'r3.'