LESSON 6

Problem Solving Plan
Estimate or Exact Amount?

Objective Decide if an estimate or an exact answer is needed to solve a problem.

CA Standards

MR 2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

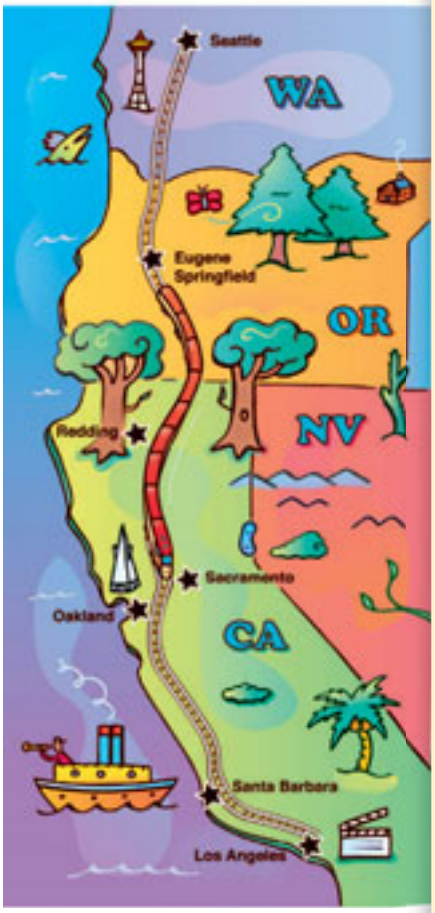
MR 2.4 Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.

Also NS 1.4, NS 2.0, KEY NS 2.1, MR 1.0, MR 2.0, MR 2.3, MR 3.0, MR 3.2, MR 3.3

Learn Through Reasoning

Before you solve a problem, you must first decide whether you need an estimate or an exact answer.

The Coast Starlight train runs between Los Angeles and Seattle, Washington. The distance from Los Angeles to Santa Barbara is 104 miles. The distance from Los Angeles to Redding is 720 miles.



EXACT ANSWER

How far it is from Santa Barbara to Redding?

Since the question asks for the exact distance, you need to find an exact answer.

$$\begin{array}{r} {}^{1}7{}^{1}\cancel{2}\cancel{0} \\ -\ 104 \\ \hline 616 \end{array}$$

It is 616 miles from Santa Barbara to Redding.

ESTIMATE

About how far it is from Santa Barbara to Redding?

Since the question asks "about how far," you can estimate the answer to solve the problem.

$$\begin{array}{rcr} 720 & \text{rounds to} & 700 \\ -\ 104 & \text{rounds to} & -\ 100 \\ \hline 616 & & 600 \end{array}$$

It is about 600 miles from Santa Barbara to Redding.

ESTIMATE TO SOLVE PROBLEM

A student ticket to the railroad museum costs $4.25. Can Steve buy 5 tickets with a $20 bill?

$4.25 rounds to $4.00

$4.00 + $4.00 + $4.00 + $4.00 + $4.00 = $20.00

Each ticket costs more than $4.00. So the total cost is more than $20.00. Steve cannot buy 5 tickets.

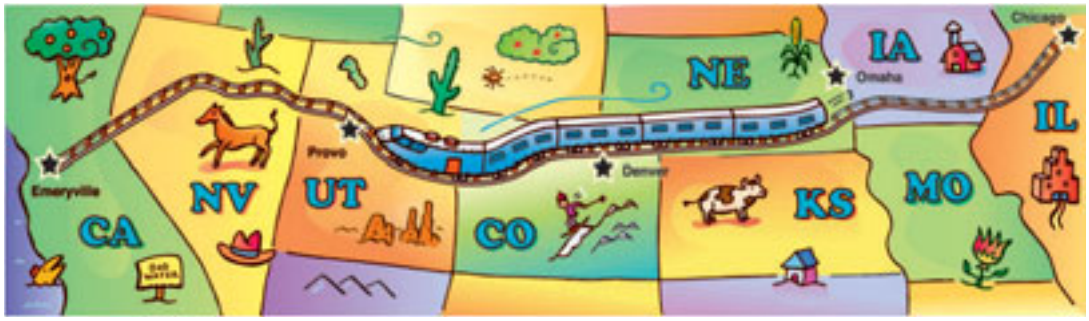
Guided Problem Solving

Solve using the Ask Yourself questions. Did you use an estimate or an exact answer?

1. The California Zephyr train runs 2,438 miles between Emeryville and Chicago. The distance from Chicago to Provo is 1,563 miles. To the nearest hundred miles, what is the distance between Provo and Emeryville?

Ask Yourself

- Does the problem ask for an exact amount?
- Will an estimate work for this problem?



Math Talk When is an estimate good enough? When might it be better to give an exact answer? Give examples to explain your thinking.