



# 1.1

## Introduction to Quantitative Reasoning Citizenship

---

### SPECIFIC OBJECTIVES

By the end of this lesson, you should understand that

- quantitative reasoning is the ability to understand and use quantitative information. It is a powerful tool in making sense of the world.
- relatively simple math can help make sense of complex situations.
- 1 billion =  $1,000 \times 1,000 \times 1,000$ .
- the representations 1 billion, 1,000,000,000, and  $10^9$  have the same meaning.

By the end of this lesson, you should be able to

- identify quantitative information.
- convert units from feet to miles.
- round numbers (based on homework).
- name large numbers (based on homework).
- work in groups and participate in discussion using the group norms for the class.

## PROBLEM SITUATION: DOES THIS INFORMATION MAKE SENSE?

During this course, you will be presented with a number of problem situations. These problem situations will help you learn how to evaluate the types of quantitative information you may encounter in everyday life.

*Note:* Throughout this course, a calculator may help with some problems and activities. When needed, help guides for calculators are available here: <http://bit.ly/QWhelpguides>

Problem Situation 1 asks you to use quantitative information to figure out if a statement makes sense.

Imagine that you just received a flier in the mail with the following statement:<sup>1</sup>

Every year since 1970, the  
number of American children  
gunned down has doubled.

(1) What \_\_\_\_\_ groups might have wanted to mail a flier like this? What are some social issues or political ideas that this statement might support?

## IS THE INFORMATION REASONABLE?

The flier in “Problem Situation 1” includes **quantitative information**. Quantitative information uses concepts about quantity or number (this can be specific numbers or a pattern based on numerical relationships such as doubling).

You hear and see statements that include quantitative information every day. People use these statements as evidence to convince you to do things like

- vote a certain way;
- donate or give money to a cause; or
- understand a health risk.

You often do not know whether these statements are true. You may not be able to locate the information that supports these statements, but you can start by asking if the statements are **reasonable**. This means asking if the statements make sense. You will be asked if information is

---

<sup>1</sup> Adapted from Joel Best, *Damned Lies and Statistics: Untangling Numbers from the Media, Politicians, and Activists* (Berkeley: University of California Press, 2001).

*reasonable* throughout this course. This lesson will help you to understand what is meant by this question.

(2) Do you think the statement “Every year since 1970, the number of children gunned down has doubled,” is a reasonable statement? Discuss with your group.

(3) Using only the information that was included in the flier, how can you decide if the statement was reasonable? Talk with your group about the different ways in which you might answer this question.

(4) In Question 3, you thought about how to decide if the statement was reasonable. One approach is to start with a number for the first year. Put this number into the table below. Complete the other values in the second column of the table. Do not complete the third column right now.

Year	Number of Children Gunned Down	Rounded (using words)
1970		
1980		
1990		
2000		
2010		
2015		

(5) Refer to the table you created in Question 4. Does the number of children gunned down in the year 2015 seem reasonable? What kind of information might help you decide?

## MAKING CONNECTIONS

Record the important mathematical ideas from the discussion.

## About This Course

This course is called a *quantitative reasoning* course. This means you will learn to use and understand quantitative information. It will be different from many other math classes you have taken. You will learn and use mathematical skills connected to situations like the one you just discussed in this lesson. You will talk, read, and write about quantitative information.

The lessons in this course will focus on three themes.

- **Citizenship:** You will learn how to understand information about your society, government, and world that can impact many decisions you make.
- **Personal Finance:** You will study how to understand financial information and how to use it to make decisions in your life.
- **Medical Literacy:** You will learn how to understand information about health issues and medical treatments.

This lesson (1.1) is part of the “Citizenship” theme. In this lesson, you learned about ways to decide if information is reasonable. This can help you form an opinion about an issue.

Today, the goal was to introduce you to the idea of quantitative reasoning. This will help you understand what to expect from the class. Do not worry if you did not understand all of the math concepts. You will have more time to work with these ideas throughout the course.

In this course you will learn to do the following things:

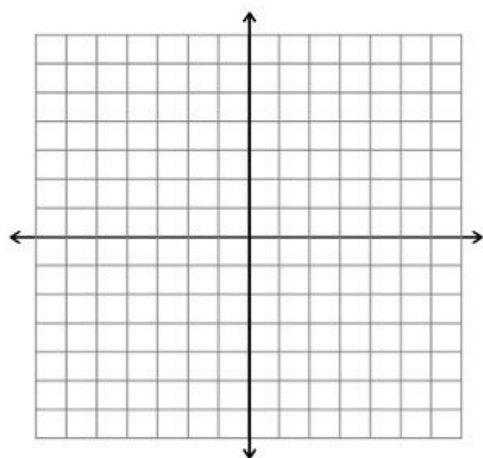
- Understand and interpret quantitative information.
- Evaluate quantitative information. Today you did this when you answered if the statement was reasonable.
- Use quantitative information to make decisions.

Solve the following system.

$$y = -5x + 4$$

$$10x + 2y = -4$$

Method 1:



Method 2:

Method 3: