

CHAPTER 1 Mathematical Processes  
1.3 Focus on Connecting  
Making Connections

**Example:**

a) Estimate the time spent by grade 9 students in studying for end-of-semester exams.

b) A thunderstorm over metropolitan Toronto deposited 3 cm of rain on the city. Estimate the number of litres of water that rained down on Toronto during the storm.



**Solution:**

a) Estimate the time spent by grade 9 students in studying for end-of-semester exams.

Answers will vary. Assume there are 200 students in grade nine, and that each student writes 6 end-of-semester exams. Assume that each exam requires 4 h of study. The total study time can be calculated:

$$200 \times 6 \times 4 = 4800 \text{ h}$$

b) Use a map or the Internet to determine that metropolitan Toronto approximately covers a rectangle measuring about 30 km by 15 km. The volume of water can be calculated:

$$\begin{aligned} V &= l \times w \times h \\ &= 30 \times 1000 \times 100 \times 15 \times 1000 \times 100 \times 3 \\ &= 405\,000\,000\,000\,000 \text{ cm}^3 \end{aligned}$$

Divide by 1000, since  $1000 \text{ cm}^3 = 1 \text{ L}$ , to obtain the number of litres:  
405 000 000 000 L or 405 billion litres.

**Practice:**

1. The gross national debt in the USA in 2006 was about \$10 trillion. How much was each American's share of this debt?



2. Sandra's father baked some cupcakes, and brought a plate to Sandra and her two friends. Sandra ate  $\frac{1}{6}$  of the cupcakes on the plate, Kumar ate  $\frac{1}{3}$ , and Elzbieta ate  $\frac{1}{4}$ . If there were 3 cupcakes left over, how many were on the plate to begin with?

**Answers:**

1. about \$30 000      2. 12