Steps in Reading Math Word Problems

Many people have a hard time solving word problems in Math classes. It is easy to stare at a problem and not have any idea how to get started. So if we have a standard set of steps to follow to work through word problems, we will know how to get started and things get a lot easier.

There are many possible ways to approach word problems, but this is the process we are going to use for this course.

Steps for solving word problems effectively:

1) Read the problem and make sure you understand everything you read.
   a) Rewrite the main ideas of the word problem in your own words.
   b) Determine what the question is asking.
   c) Identify the type of problem.

2) Develop a plan for solving the problem.
   a) What information is given?
   b) What information is needed to solve the problem?
   c) How will you use the information to solve the problem?

3) Carry out the plan.

4) Examine the solution you obtained.
   a) Does the answer make sense in the context of the problem?
   b) Can you check your results? Can you check your process?
   c) If it seems correct, go on. If not return to step #1.

5) Write the solution in a complete sentence in the context of the problem.
**Sample problem #1 (CH1, p.94, #26)**

One tablespoon of white granulated sugar contains 45 calories. How many calories are in 8 tablespoons of white granulated sugar?

1) Read the problem and make sure you understand everything you read.
   a) Rewrite the main ideas of the word problem in your own words.

   __________ 1 tablespoon of sugar contains 45 cal __________

   __________ how many cal in 8 tablespoons __________

   __________ multiplication problem __________

   b) Determine what the question is asking.

   __________ how many cal in 8 tablespoons __________

   __________

   c) Identify the type of problem.

   __________ multiplication problem __________

   __________

2) Develop a plan for solving the problem.
   a) What information is given?

   __________ 1 tablespoon = 45 cal __________

   __________ how many cal in 8 tablespoons __________

   __________

   b) What information is needed to solve the problem?

   __________ how to multiply __________

   __________

   c) How will you use the information to solve the problem?

   __________ multiply 45 x 8 __________

   __________
3) Carry out the plan.

\[ 45 \times 8 = 360 \text{ cal} \]

4) Examine the solution you obtained. Does it make sense?

1 tablespoon of sugar = 45 cal
8 tablespoons of sugar = 360 cal

*Makes sense.*

5) Write the solution in a complete sentence in the context of the problem.

*If one tablespoon of sugar contains 45 calories, then 8 tablespoons must contain 8 times as many calories as one tablespoon.*
Sample problem #2 (CH1, p.94, #27)

A small business owner recently ordered 16 digital cameras that cost $430 each and 5 printers that cost $205 each. Find the total cost for both items.

1) Read the problem and make sure you understand everything you read.
   a) Rewrite the main ideas of the word problem in your own words.
      
      | 16 cameras at $430 each |
      | 5 printers at $205 each |
      | find total cost         |

   b) Determine what the question is asking.
      
      | find total cost of the purchase |

   c) Identify the type of problem.
      
      | total cost problem |

2) Develop a plan for solving the problem.
   a) What information is given?
      
      | find total cost to purchase 16 cameras |
      | find total cost purchase 5 printers    |
      | add them together                       |

   b) What information is needed to solve the problem?
      
      | Addition & multiplication               |

   c) How will you use the information to solve the problem?
      
      | cost of 16 cameras = 16 \times 430       |
      | cost of 5 printers = 5 \times 205        |
      | find the total cost by adding the two    |
3) Carry out the plan.

\[
\begin{align*}
16 \times 430 &= 6880 \\
5 \times 205 &= 1025 \\
\hline
\text{Total Cost} &= 7905
\end{align*}
\]

4) Examine the solution you obtained. Does it make sense?

16 cameras at $430 each cost $6880
5 printers at $205 each cost $1025
The sum of the costs is $7905

Makes sense.

5) Write the solution in a complete sentence in the context of the problem.

\underline{16 cameras at $430 each cost $6880}
\underline{5 printers at $205 each cost $1025}
\underline{for a total of $7905}
Sample problem #3 (Ch7, p.516, #20)

A salesperson earned a commission of $3575 for selling $32,500 worth of books to various book stores. Find the commission rate.

6) Read the problem and make sure you understand everything you read.
   a) Rewrite the main ideas of the word problem in your own words.
      $3575 was earned for selling $32,500 worth of books

   b) Determine what the question is asking.
      find the commission rate

   c) Identify the type of problem.
      calculating commission

7) Develop a plan for solving the problem.
   d) What information is given?
      commission earned = $3575
      total sales = $32,500
      find the commission rate

   e) What information is needed to solve the problem?
      formula for calculating commission
      amount of commission = commission rate * amount of sales

   f) How will you use the information to solve the problem?
      substitute known values into the formula
      solve for the unknown


8) Carry out the plan.

\[
\text{amount of commission} = \text{commission rate} \times \text{amount of sales} \\
3575 = x \times 32500 \\
3575 = 32500 \times x \quad \text{divide both sides by 32500} \\
\frac{3575}{32500} = x \\
0.11 = x
\]

\textbf{Therefore the Commission rate is 11%}

9) Examine the solution you obtained. Does it make sense?

Let’s check the solution by substituting our answer in the original formula:
\[
\text{amount of commission} = \text{commission rate} \times \text{amount of sales} \\
3575 = 0.11 \times 32500
\]

Yes, it makes sense.....

Write the solution in a complete sentence in the context of the problem.

\underline{the salesperson earned an 11% commission for selling $32,500 worth of books}
**Recommended Problems:**

- Chapter 1 Review, #150 (p. 92)
- Chapter 1 Test, #25 (p. 93)
- Chapter 2 Review, #56, 57 (p. 154, 155)
- Chapter 3 Review, #71, 72 (p. 206)
- Chapter 4 Review, #60, 75 (p. 321, 322)
- Chapter 5 Review, #113 (p. 407)
- Chapter 5 Test, #27 (p. 409)
- Chapter 7 Review, #84, 87 (p. 532)
- Chapter 9 Review, #54 (p. 641)
- Chapter 10.1, #55, 56 (p. 709)
Student Work Sheets:

Problem # _______,  Page number ________

1) Read the problem and make sure you understand everything you read.
   a) Rewrite the main ideas of the word problem in your own words.

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

   b) Determine what the question is asking.

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

   c) Identify the type of problem.

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   ____________________________________________________________
   ____________________________________________________________
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   ____________________________________________________________

2) Develop a plan for solving the problem.
   a) What information is given?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

   b) What information is needed to solve the problem?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
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   ____________________________________________________________

   c) How will you use the information to solve the problem?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
3) Carry out the plan.

4) Examine the solution you obtained. Does it make sense?

5) Write the solution in a complete sentence in the context of the problem.