



## Math Problems

Read the following facts about the steel industry and related topics. Choose one and develop a math problem. Write a paragraph to describe the situation. Give the step-by-step procedures for solving the problem. Make sure that the steps are in the correct sequential order. Follow each step to solve the problem. Show all of your work. Create an illustration to demonstrate your solution: a chart, table, graph, or other type of illustration. Prepare an oral presentation to introduce the situation, solve it, and explain your answer. Present your problem to the class and be prepared to answer questions from your classmates.

Choose from among the following details:

- \* to make one ton of steel, you need:
  - 2,500 lbs. iron ore
  - 1,400 lbs. coal
  - 120 lbs. limestone
  
- \* ninety tons of molten iron equals the weight of 30 elephants;
  
- \* on an average day, 4,300 tons of molten iron was transported across the hot metal bridge;
  
- \* the melting point of iron is 2,795 degrees Fahrenheit; the boiling point of iron is 5,432 degrees Fahrenheit;
  
- \* sound travels at a rate of 5,000 feet per second (1,500 meters per second) in pure water; sound travels at a rate of 20,000 feet per second (6,000 meters per second) in solid steel;
  
- \* the elasticity of a material is the amount of stretch it has before reaching its limit; steel has an elasticity of 1%; coiled steel has a much greater elasticity;
  
- \* steel is a denser material than water, so it will not float in water; a ship will float because the hull is full of air; a ship floats because it displaces the water by the weight of the steel combined with the air in the hull; the ship will sink until enough water is displaced to match the weight of the steel and the air in the hull;



- \* pressure is defined as the force on a certain area; the standard unit of measure of pressure is the pascal (Pa); the pressure (Pa) equals 1 newton per square meter; the pressure at the center of the Earth is 400 billion Pa; the pressure of a shark bite is 30 million Pa; steel withstands the pressure of 40 million Pa;
  
- \* in the coking process, 17 tons of coal equals 13 tons of coke and 4 tons of waste material; the waste is mostly hot coal tar;
  
- \* at the height of the steelmaking industry, the Hazelwood coke battery produced coke each day in the process involving:
  - 4 oven batteries with a combined total of 365 ovens
  - each oven was 2 stories tall and 18 inches wide
  - 17 tons of coal was poured through a hole in the roof of each oven
  - the coal was heated to 1,700 degrees Fahrenheit in each sealed oven
  - the 17 tons of coal produced 13 tons of coke
  
- \* 27,000 tons of coal was transported each day to the Clairton Works; the transportation required 25 river barges or 385 rail hoppers or 1,000 trucks; the coal was delivered 24 hours a day for 7 days a week.

Use a variety of resources to find other interesting and relevant facts about steel or a related industry. Use the facts to create a word problem. Write the problem and solve it, showing all of your work. Create an illustration to demonstrate the solution and write an explanation of the solution to your problem. Present your problem to the class. Give background details as to the facts about your problem. Be prepared to answer questions from your classmates about the problem.