

**Name:**

Your clinics are staffed and the nurses and assistants are taking care of the villagers. Before the war, the villagers grew enough food for everyone in the village. Today, there are too few adults to work the fields and grow enough food. There is a shortage of food and medicine. Electricity is unreliable, so it is difficult to store certain foods and medication. It's hard to keep the villagers healthy when they do not have enough to eat.

## Nurses on a Mission

You have been contacting organizations and asking for donations. Your answers to the following questions will support the effort to improve the lives of the villagers.

### Question 1

The Department of Health has pledged to give \$50,000 for food and medical supplies for the five villages on the basis of the current populations. The table shows the current populations.

Village	Current Population
L	2200
J	2000
R	1900
M	2100
P	1800

- a) The money will be distributed on a per person basis. How much is allotted for each person?

- b) Regular vaccines must be refrigerated. Regular vaccines cost \$2.00 per person and heat-resistant vaccines cost \$3.25 per person. How much would each village save on vaccines for its current population if the village had access to reliable electricity for refrigeration? Show your work or explain how you found the answer.

### Question 2

The Department of Health decides to allocate the per person amount calculated previously, regardless of the number of villagers. Other organizations are also making donations to buy food and medicine. The United Nations has pledged to give \$4.00 per person. The United Relief has pledged to give 20% of Department of Health's new allocation.

- a) Write an equation to find how many people must live in the villages for the combined United Nations and United Relief contributions to equal the Department of Health allocation.

- b) How many solutions does your equation have? Show how you found the answer.

### Question 3

A solar generating system for a village costs \$14,000. Each village may choose one of the following options to pay for the solar system.

**Option 1:** The National Utility Company will give each village an \$8000 rebate plus a utility savings of \$1.25 per person per year.

**Option 2:** The Department of Health will give \$2 per person per year plus a donation of \$5000.

- a) Village L currently has 2200 people. Write an equation to show the total value of Option 1 for Village L.

b) Write an equation to show the total value of Option 2 for Village L.

c) Algebraically compute how many years it will take for the value to be the same for both options.

d) Explain how you could use a graph of the equations to check your answer.

#### Question 4

Village R has a current population of 1900. You expect there will be 50 babies born per year. If the medical community can prevent any deaths, what will be the population of Village R in ten years? Show your work or explain how you found the answer.

### Question 5

A shipping container holds 20 metric tons of corn. Corn costs \$175 per metric ton. It costs \$1000 to ship a container of corn to Africa.

- a) Write an equation to find the cost of shipping  $x$  containers of corn to Africa.

- b) Solve your equation to find the cost of shipping 3 containers of corn to Africa.

### Question 6

The Red Star shipping company offers a special rate for shipping grain to Africa. The company charges a \$500 docking fee plus \$600 per container.

- a) Write an equation to find the cost ( $c$ ) of shipping  $x$  containers of grain to Africa.

b) Graph your equation. (To make a graph, draw two points that should be on the line.)



c) Based on the graph, what is the cost to ship 5 containers of corn to Africa?

### Question 7

The White Star Shipping Company also offers a special rate for shipping grain to Africa. The White Star Company charges a \$900 docking fee plus \$550 per container.

- a) Write an equation to find the cost of shipping  $x$  containers of grain to Africa.

- b) Solve your equation to find the cost of shipping 5 containers of grain to Africa.

- c) Which company offers the better deal for shipping 5 containers of grain, the Red Star Company or the White Star Company?

### Question 8

Two other companies offer special rates for shipping grain to Africa.

- The Black Line Shipping Company charges \$650 per container plus a \$600 docking fee.
- The Green Line Shipping Company charges \$550 per container plus an \$1100 docking fee.

How many containers must be shipped for the costs to be the same for both companies? Show your work or explain how you found the answer.