Dear J. Q. Public,

We are writing to inform you of a recent finding by our food safety inspector. At about the same time every year for the last few years, cans of certain foods have bulged in local stores and homes. No one has been able to determine exactly why this happens. We have found that the cans bulged only during summer months and that only locally canned food is affected. Over the last few years, some local canneries have been using a different canning process, which requires less time and lower temperatures. We are uncertain whether there is any connection between the new canning process and the bulging cans.

We are concerned for the safety of the citizens. Bulging cans may contain bacteria called *Clostridium botulinum*, which can cause a type of food poisoning called botulism. *Clostridium botulinum* thrives in warm environments and causes cans to bulge as the bacteria grow. *Clostridium botulinum* may be found in normal or bulging cans, depending on the growth stage.

We would like to solve this case as quickly and efficiently as possible. If you have any clues that will help us, please let us know. Thank you for your time.

City Health Department

Use the scientific method to investigate the case of the bulge.

**State the Problem**

1. In your own words, state the central problem that the City Health Department faces.

**Comprehending Ideas**

2. What additional information could the City Health Department provide that would help you investigate the problem?
The Case of the Bulge, continued

Form a Hypothesis

3. Form a hypothesis that explains the cause of the bulging cans.

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Test the Hypothesis

4. Design and outline an experiment that the City Health Department could perform to test your hypothesis. Be sure to use a control group and an experimental group in your experiment plan.

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Communicate Results

5. In your ScienceLog, write a reply letter to the City Health Department. Share your hypothesis and the steps you would take to solve this problem. Include the results that would prove that your hypothesis is correct.
Dear J. Q. Public,

We are writing to inform you of a recent finding by our food safety inspector. At about the same time every year for the last few years, cans of certain foods have bulged in local stores and homes. No one has been able to determine exactly why this happens. We have found that the cans bulged only during summer months and that only locally canned food is affected. Over the last few years, some local canneries have been using a different canning process, which requires less time and lower temperatures. We are uncertain whether there is any connection between the new canning process and the bulging cans.

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City Health Department

Use the scientific method to investigate the case of the bulge.

**State the Problem**

1. In your own words, state the central problem that the City Health Department faces.

   **Citizens may get botulism by eating contaminated food from cans.**

**Comprehending Ideas**

2. What additional information could the City Health Department provide that would help you investigate the problem?

   Sample answer: The Health Department could provide a record of the number of bulging cans, the dates when the problem occurred, and whether *Clostridium botulinum* has been found in any cans.
The Case of the Bulge, continued

Form a Hypothesis
3. Form a hypothesis that explains the cause of the bulging cans.

Sample answer: The bulging cans are a result of local canneries using a new canning process that allows the growth of bacteria.

Test the Hypothesis
4. Design and outline an experiment that the City Health Department could perform to test your hypothesis. Be sure to use a control group and an experimental group in your experiment plan.

Sample answer: Collect two groups of cans from the local canneries. The groups will be identical except that only one group of cans will be processed using the new method. Observe the cans at the end the summer. Count the number of cans that have bulged in each group. Analyze the data, and determine whether the cans processed using the new method were significantly more likely to bulge.

Communicate Results
5. In your ScienceLog, write a reply letter to the City Health Department. Share your hypothesis and the steps you would take to solve this problem. Include the results that would prove that your hypothesis is correct.

Sample answer to item 5:
Answers will vary. Answers should show a knowledge of the scientific method and of the case. The proposed results should be consistent with the experiment and the original hypothesis.