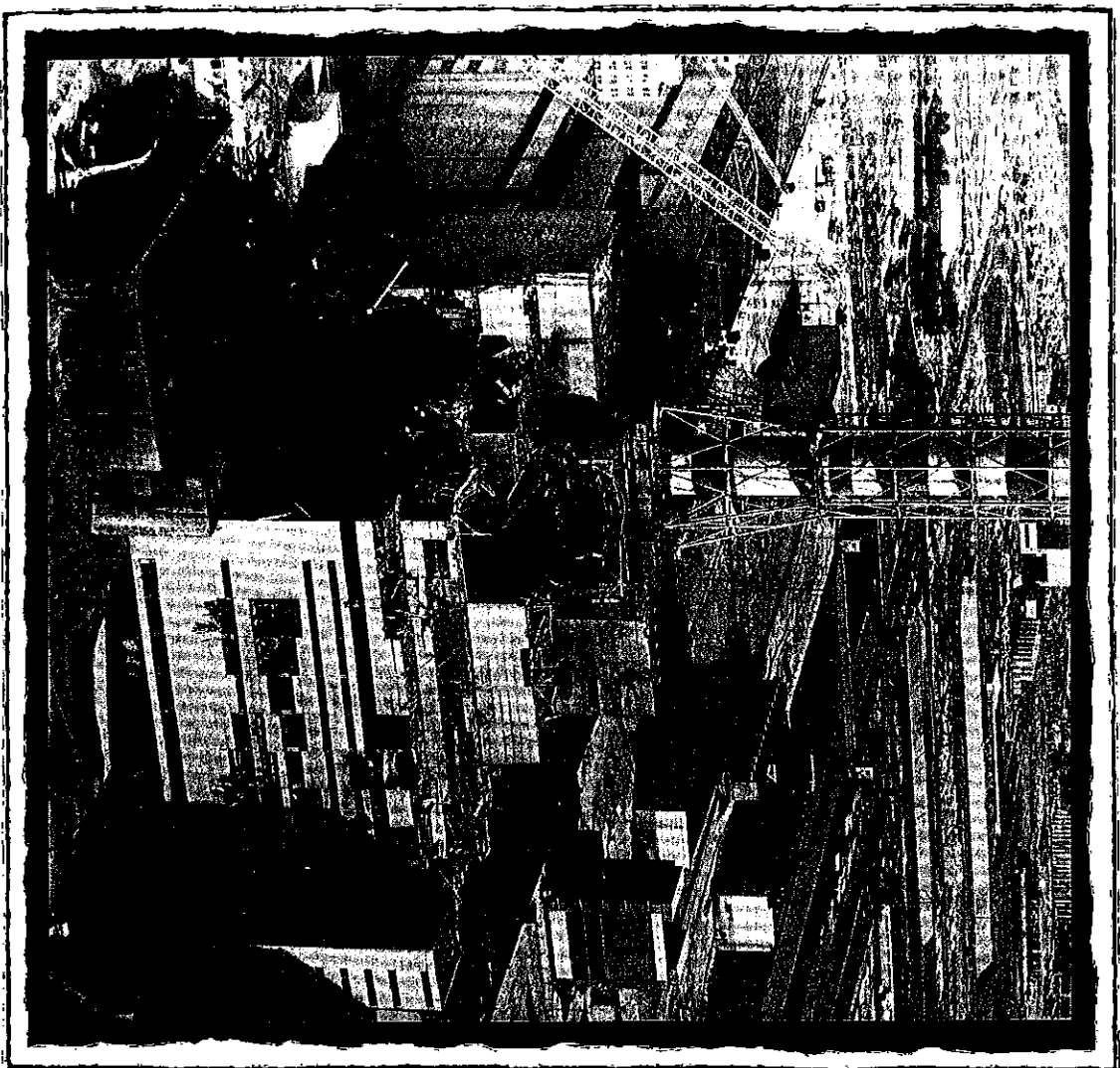


ATOMIC MELTDOWN AT CHERNOBYL



At a nuclear power plant in Sweden one Monday morning, a worker walked past a radiation detector and set off the dreaded alarm. Officials quickly checked his clothing and were shocked to find dangerously high levels of radiation. Fearing a deadly radiation leak, officials evacuated the plant. They tested all 600 employees to determine if they, too, were "hot"—and they were! Officials then tested the ground and found five times the normal level of radiation. But inside the plant, there was nothing wrong. What was going on?

² The Swedes alerted the United States when other power stations around the country also reported high radiation levels. Soon reports of radiation poured in from Finland, Norway, and Denmark. Although the Swedes were relieved that the source of radiation was not their own country, they wanted to know where it was coming from. Had there been a nuclear explosion somewhere?

³ By Monday afternoon, April 28, 1986, Swedish officials had figured out that the atomic fallout was being carried by the wind. Scientists studied the radioactive

A protective wall (at left in photo) was constructed around the damaged area of the nuclear reactor at Chernobyl.

material and the wind pattern and concluded that a nuclear accident had indeed occurred. They tracked the radioactive cloud to Ukraine, a republic in the former Soviet Union.

⁴ A Swedish diplomat in Moscow, meanwhile, began to ask probing questions. But for 12 hours there was no reply from the Soviet government. Even the Soviet people were kept in the dark. Finally, at 9 P.M., the Soviets announced that there had been a nuclear reactor accident at the Chernobyl power plant. No casualties or other details on the worst nuclear accident in history were reported that night. The Soviets also kept secret that the explosion had happened three full days before.

⁵ From satellite photographs, scientists in the United States viewed the Chernobyl disaster. An explosion had blown the roof off a huge atomic reactor. Walls around the reactor bulged out, and in the center of the wreckage, a white hot fire was blazing.

⁶ Chernobyl is located 80 miles north of Kiev, the capital of Ukraine. The nuclear facility was old and poorly built. Inside its reactors were graphite bricks that could stop or slow down the nuclear chain reaction. Graphite, a form of carbon, was used to absorb radiation. But graphite is dangerous. If it catches fire, it can reach temperatures of more than 5,000 degrees

Celsius. Because of this, most modern nuclear power plants no longer use graphite reactors. And they reinforce the buildings that house their atomic reactors with a concrete shell. The shell is designed to prevent radioactive materials from escaping during an accident. Chernobyl did not have this safety device. So when one of its reactors exploded and the graph-

ite ignited, radioactive debris escaped freely into the air.

⁷ The Soviets moved quickly but quietly shortly after the accident. They sealed off the power plant and started to evacuate residents who lived within 19 miles of the facility. Some 50,000 people had to leave all their belongings behind and board buses and trains that would take them



The massive amounts of radiation released in the Chernobyl accident resulted in deformities in children born in the years immediately following the accident.

away from Chernobyl. Medical teams, scientists, and other experts arrived at the scene. Doctors were shocked to find people whose skin had turned brown. Their hair and eyelashes had fallen out. They felt weak and sick. One man said when he got out of his bed and stood up, the skin on his leg slipped off as if it had been a stocking. Some victims were so "hot" that even the doctors treating them became dangerously exposed.

⁸ The situation at Chernobyl worsened each day, yet the Soviets said little and asked for little from the outside world. They desperately tried to put out the raging graphite fire at the plant. Huge helicopters were brought in to attack the fire from the air. To protect the pilots from radiation, sheets of lead were placed under their seats. The brave pilots repeatedly flew over the reactor and dropped clay, lead, sand, and other materials on the inferno. They did not use water because it would have only fueled the flames. It took more than 5,000 tons of materials and 12 days to put out the fire. When ground crews could get near the plant, they bored tunnels under the concrete slab that supported the reactor. Water was then pumped into the tunnels to lower the temperature of the burning reactor core.

⁹ The area around Chernobyl remained "hot" for months after the accident. Work

crews had to limit the time they spent near the reactor, so the cleanup took longer. There was so much contaminated soil that the government didn't know where to bury it all. As for the damaged reactor, officials decided to encase it in a gigantic coffin. Trucks carrying ready-mix cement poured it into specially made steel vats. The cement-filled vats were like bricks. They formed a concrete wall, the "coffin," around the reactor.

¹⁰ The cleanup and safety measures taken by the Soviets did little to satisfy the rest of the world. The radioactive fallout had covered large sections of Ukraine and other parts of the former Soviet Union before spreading across most of Europe. Europeans were outraged. They accepted that the nuclear blast had been an accident, but they were furious that the Soviets tried to hide what happened. They were denied the chance to protect themselves.

¹¹ Radioactive fallout contaminated water, land, livestock, and food supplies. Poland, which had had radiation levels as high as 100,000 times the normal level, feared for the lives of its children. People were told not to eat farm products or drink milk from cows. In Norway, Sweden, and Finland, people were told not to drink or use rain water or eat freshwater fish. Officials in Italy banned the sales of some

food because they were "hot." In Scotland farmers could not sell the meat from their sheep because the animals had grazed on contaminated grass.

¹² The Soviets claimed that only 31 people died because of Chernobyl, but the actual number is much higher. Since the accident, countless new cases of cancer have developed. Scientists estimate that perhaps more victims may die from the Chernobyl blast than all the people killed in World War II. And many areas affected by Chernobyl will remain "hot" for thousands of years, too "hot" to sustain life.

If you have been timed while reading this article, enter your reading time below. Then turn to the Words-per-Minute Table on page 195 and look up your reading speed (words per minute). Enter your reading speed on the graph on page 196.

Reading Time: Lesson 19

Minutes Seconds

A Finding the Main Idea

One statement below expresses the main idea of the article. One statement is too general, or too broad. The other statement explains only part of the article; it is too narrow. Label the statements using the following key:

M—Main Idea B—Too Broad N—Too Narrow

- _____ 1. A nuclear explosion resulted in widespread contamination.
- _____ 2. In 1986, the Soviet Union experienced a serious nuclear accident resulting in sickness and death and then tried to hide it from the world.
- _____ 3. The Soviet Union claimed that 31 people died as a direct result of the Chernobyl accident.

_____ Score 15 points for a correct M answer.

_____ Score 5 points for each correct B or N answer.

_____ Total Score: Finding the Main Idea

B Recalling Facts

How well do you remember the facts in the article? Put an X in the box next to the answer that correctly completes each statement about the article.

1. High radiation levels were first noticed by
 - ☐ a. Russia.
 - ☐ b. Sweden.
 - ☐ c. a United States satellite.
2. Chernobyl is located north of
 - ☐ a. Ukraine.
 - ☐ b. Kiev.
 - ☐ c. Moscow.
3. Most modern nuclear reactors
 - ☐ a. have had at least one major accident.
 - ☐ b. are surrounded by a protective shell.
 - ☐ c. operate without any risks.
4. Many European countries
 - ☐ a. were seriously affected by the radiation.
 - ☐ b. sympathized with the Soviets.
 - ☐ c. were not at all harmed by the accident.
5. In an attempt to contain the radiation, Soviet officials decided to
 - ☐ a. flood the reactor.
 - ☐ b. move the reactor to an uninhabited area.
 - ☐ c. enclose the reactor in a concrete coffin.

Score 5 points for each correct answer.

_____ Total Score: Recalling Facts

C Making Inferences

When you combine your own experience and information from a text to draw a conclusion that is not directly stated in that text, you are making an inference. Below are five statements that may or may not be inferences based on information in the article. Label the statements using the following key:

C—Correct Inference F—Faulty Inference

- _____ 1. At the time of the accident, not much was known about nuclear power.
- _____ 2. Soviet nuclear reactors are safer than American reactors.
- _____ 3. Swedish officials feared a serious radiation leak at one of their nuclear plants.
- _____ 4. Norway and Finland reported the highest levels of radioactive fallout.
- _____ 5. The Soviets were capable of handling the disaster by themselves.

Score 5 points for each correct answer.

_____ **Total Score:** Making Inferences

D Using Words Precisely

Each numbered sentence below contains an underlined word or phrase from the article. Following the sentence are three definitions. One definition is closest to the meaning of the underlined word. One definition is opposite or nearly opposite. Label those two definitions using the following key. Do not label the remaining definition.

C—Closest O—Opposite or Nearly Opposite

1. The Swedes alerted the United States when other power stations around the country also reported high radiation levels.
_____ a. blamed
_____ b. informed
_____ c. kept a secret from
2. A Swedish diplomat in Moscow, meanwhile, began to ask probing questions.
_____ a. pointless
_____ b. many
_____ c. searching
3. There was so much contaminated soil that the government didn't know where to bury it all.
_____ a. healthy and pure
_____ b. tainted and poisoned
_____ c. rocky
4. Europeans were outraged.
_____ a. furious
_____ b. pleased
_____ c. amused

5. And many areas affected by Chernobyl will remain...too "hot" to sustain life.

_____ a. support and maintain
 _____ b. destroy
 _____ c. discover

_____ Score 3 points for each correct C answer.

_____ Score 2 points for each correct O answer.

_____ Total Score: Using Words Precisely

Author's Approach

Put an X in the box next to the correct answer.

- The author uses the first sentence of the article to
 - ☐ a. explain how radiation from Chernobyl was detected in Sweden.
 - ☐ b. describe a nuclear power plant in Sweden.
 - ☐ c. describe safety procedures at a power plant in Sweden.
- In this article, "And many areas affected by Chernobyl will remain 'hot' for thousands of years, too 'hot' to sustain life" means
 - ☐ a. the radiation levels in these areas will be too high to support life.
 - ☐ b. the temperature in these areas will be too high to support life.
 - ☐ c. people won't be able to live in these areas for political reasons.
- The author probably wrote this article in order to
 - ☐ a. convince the reader that the Soviet Union acted irresponsibly.
 - ☐ b. compare technology in the former Soviet Union with that in other parts of the world.
 - ☐ c. inform the reader about the worst nuclear accident in history.

Enter the four total scores in the spaces below, and add them together to find your Reading Comprehension Score. Then record your score on the graph on page 197.

- How is the author's purpose for writing the article expressed in paragraph 8?
 - ☐ a. The author tries to persuade the reader that the Soviet Union did everything it could to cover up the accident.
 - ☐ b. The author tells the reader what the Soviets did to try to put out the graphite fire at the plant.
 - ☐ c. The author points out that a graphite fire would not have occurred in modern plants in other parts of the world.

_____ Number of correct answers

Record your personal assessment of your work on the Critical Thinking Chart on page 198.

Lesson 19

Score Question Type

_____ Finding the Main Idea

_____ Recalling Facts

_____ Making Inferences

_____ Using Words Precisely

_____ Reading Comprehension Score