Name _____ Date _____ Class _____

Enrichment **LESSON 2**

Clone from the past?

Cloning is a type of asexual reproduction that produces offspring from cells taken from a multicellular organism. Scientists have successfully cloned sheep. But can they produce a clone from an animal that died more than 23,000 years ago?

The Woolly Mammoth

In 1999, a helicopter pulled an 18-metric-ton block of ice and soil from the ground in northern Siberia. Inside that huge block were the frozen remains of a woolly mammoth. Other mammoths had been discovered before. But most were fossilized bones and tusks. This mammoth, called the Zharkov mammoth, was thought at first to be well preserved. Some of its skin, hair, and soft tissue appeared to be intact.

Scientists hoped to clone the woolly mammoth by extracting DNA from its cells. Studies have shown that mammoths have a close genetic relationship with modern elephants. So the mammoth's DNA would be placed in the egg cell of a female elephant. The elephant would serve as a substitute mother. Eventually, she would give birth to a live woolly mammoth.

As the fossil was carefully thawed, however, scientists found that only a small fraction of its soft parts were intact. Further study showed that the same cold temperatures that preserved the fossil also severely damaged the chromosomes in the mammoth's body cells. Extreme cold had burst the cells. There was not enough DNA to clone the mammoth.

New Hope

In 2007, scientists discovered yet another mammoth in Siberia. "It's a lovely little baby mammoth indeed, found in perfect condition," said Alexei Tikhonov, deputy director of the Russian Academy of Science's Zoological Institute. "This specimen may provide unique material allowing us to ultimately decipher the genetic makeup of the mammoth."

The baby mammoth, named Lyuba, once again raised hopes of cloning a mammoth. Dr. Ian Barnes of the University of London stated that he now believes a mammoth will be cloned in his lifetime.

Tikhonov, however, points out that whole cells are needed for cloning. He is doubtful that Lyuba's cells, which endured freezing temperatures, are intact. Other scientists note that, even if a mammoth is cloned, its natural habitat no longer exists. They argue that it would be better to spend time and resources preserving endangered species that are now in danger of extinction.

Applying Critical-Thinking Skills

Directions: *Respond to each statement.*

1. **Explain** the main obstacle to cloning the woolly mammoth.
2. **Deduce** the information that scientists might learn—other than genetic makeup—by studying the remains of an extinct animal.

Name _____ Date _____ Class _____

Challenge **LESSON 2**

Plant Reproduction

As you have learned, plants can reproduce asexually. In the space below, design an experiment to grow a new plant using some type of asexual reproduction.

1. **Decide** which type of asexual reproduction you will investigate.

2. **Form** a hypothesis about how a new plant can be produced from a parent plant.

3. **Describe** each step of your procedure.

4. **List** the materials you will use in your experiment.

5. **Identify** any safety measures you will take.

6. **Perform** the experiment with your teacher's permission.

7. **Summarize** your results.