Name __________________________

The Secret of Silk

By Cindy Grigg

For at least four thousand years, people have treasured silk. Chinese legends say that in about 2640 B.C., a Chinese empress saw a silkworm cocoon accidentally fall into her tea. She watched the thread unravel in the warm liquid. She had discovered silk. But for thousands of years, the Chinese people kept the work of silkworms a secret. Death was the penalty for telling the secret.

Long before the rest of the world learned how silk was made, the Chinese were trading this treasured fabric with people west of China. Merchants who bought and sold silk traveled along a system of hazardous routes that came to be known as the "Silk Road." The Silk Road stretched almost 2,500 miles (6,400 km.) from Chang'an (Xi'an) in China to Rome, Italy. Silk, furs, and spices traveled west toward Rome along the road. Gold, wool, glass, grapes, garlic, and walnuts moved east toward China.

Travel along the Silk Road was treacherous and difficult. There were many different routes; it was not a single road. For safety, traders traveled in caravans of many people and animals. Some kinds of pack animals were better equipped to handle certain parts of the journey than others. Camels, for instance, were well suited to the desert. They could store large amounts of water and withstand most sandstorms. Yaks were often used in the high mountains.

The entire journey along the Silk Road could take years. Many people and animals died along the way. Very few individuals or caravans traveled the whole length of the Silk Road. The route spanned China, Central Asia, Northern India, and the Parthian and Roman Empires. It connected the Yellow River Valley to the Mediterranean Sea and passed through places such as Chinese cities of Kansu and Sinkiang and the present-day countries of Iran, Iraq, and Syria. This important trade route led to the exchange of knowledge and cultural and scientific ideas.

Silk fabric became highly prized in Rome. In fact, it was said that the first silk products to reach Rome after 50 B.C. were worth their weight in gold. The Chinese, of course, kept the secret of the silkworm and controlled silk production. They were pleased that the Romans thought that silk grew on trees. It was not until about 550 A.D. that the Romans learned the secret of silk.

In time, silk production spread around the world. Italians, French, and English learned how to make silk and became known for their silk making. The first silk factory in the United States opened in 1810. The Silk Road, though, opened forever the exchange of goods and ideas between China and the West. Today most of the world's silk cloth is made in Japan and China. The United States leads the world in making silk cloth into clothing and other things.

Would you like to know the secret of silk? Adult female moths of the species Bombyx mori lay between 300 and 500 eggs on a mulberry tree's leaf. Each egg is about the size of a pinhead. After about ten days at 27 degrees Celsius (80 degrees Fahrenheit), the larvae, which we call silkworms, hatch from the eggs and begin to eat the leaf.

For the next forty to forty-five days, the larvae eat large amounts of mulberry leaves. The silkworms molt, or lose their skin, as they grow too large for the old skin. In its feeding period, this larva consumes about twenty times its own weight in mulberry leaves. The silkworm undergoes complete metamorphosis during its life. After the last molting and feeding stage, the silkworms begin to build their cocoons.

To spin its cocoon, each silkworm produces two single strands from its two silk glands. Another pair of glands produces a sticky substance that binds the two strands together. The silkworm pushes this single strand out through a small tube in its head. Once in the air, the strand hardens and the silkworm winds the strand around itself in many layers to make a thick cocoon. The single silk strand may be as long as 900 meters (more than a half-mile long!).

At this stage, the larva, or "worm," becomes a pupa inside the cocoon. After fourteen to eighteen days, the adult moth emerges from the cocoon. The new moth does not eat or fly. It mates; the
female lays eggs. Two to three days later both the male and the female die.

Workers collect the egg-shaped cocoons. The cocoons are soaked in hot water to soften them. Then workers use machines to unwind the threads. Special techniques are used to make the threads into cloth.

People use silk in many ways other than just to make fine clothing. Did you know that silk was used for parachutes during World War II? Some bicycle racers choose tires containing silk because they provide good traction. Today silk is used for many things, including fishing lines and nets, surgical sutures, and artificial flowers. It takes the thread of six hundred thirty cocoons to make a silk blouse and the thread of one hundred ten cocoons to make a tie. Silkworms spin silk at the rate of about thirty centimeters per minute.

The larvae of a moth, more commonly known as the silkworm, contributed to the developing economies of several early countries. The silk industry brought riches, not only to China, but to many countries that the Silk Road passed through. Roads were built and sea routes investigated to boost trade. Perhaps more important were the mixing of cultures, languages, religions, ideas, and philosophies that resulted from the linking of many different civilizations along the route.

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Questions

1. Where was silk first made?
   A. the United States
   B. China
   C. Rome
   D. India

2. What was the penalty for telling the secret of silk-making?

3. The Silk Road stretched from:
   A. Rome to Russia
   B. India to the Mediterranean Sea
   C. China to the Mediterranean Sea
   D. Rome to Japan

4. Until about 550 A.D., Romans thought that silk:
   A. could only be made in China
   B. grew on trees
   C. was worth its weight in gold
   D. all of the above
   E. none of the above

5. Choose the correct sequence of the silkworm's life cycle:
   A. egg, larva, moth
   B. moth, eggs, worm, moth
   C. egg, pupa, cocoon, moth
   D. egg, larva, pupa, moth

6. Workers collect the silkworm cocoons. What are the next steps in the silk-making process?