Water
The Life Blood of the Desert

California Standard 6.2.1: Locate and describe the major river systems and discuss the physical settings that supported permanent settlement and early civilizations.

California Standard 6.2.2: Trace the development of agricultural techniques that permitted the production of economic surplus and the emergence of cities as center of culture and power.

California Standard Writing 1.0: Students write clear, coherent, focused essays. The writing exhibits students’ awareness of the audience and purpose. Essays contain formal introductions, supporting evidence, and conclusions. Students progress through the stages of the writing progress as needed.

Purpose:

- Students will become familiar with the major rivers and geography in Mesopotamia, Egypt, and Kush.
- They will discover how these water systems helped permanent settlements to develop in these arid regions, and civilizations to emerge.
- They will study agricultural improvements that led to surpluses and the emergence of cities

Objectives:

- Students will discuss what makes a civilization.
- Students will learn vocabulary related to agriculture and irrigation.
- Students will read information on the Euphrates, Tigris, and Nile Rivers and the geography of Mesopotamia, Egypt and Kush.
- Students will complete a map labeling the rivers, mountain ranges, deserts, seas, and cities of the regions. Students will discuss where cities developed and why.
- Students will complete a timeline showing when these developments took place.
- Students will research the irrigation techniques used by these regions and complete a compare and contrast graphic organizer.
- Students will research the agricultural techniques developed in these regions.

Procedure:

- Day 1  Read “What Makes a Civilization?” and discuss the characteristics. (see handouts).
  Present vocabulary and make picture flashcards with definitions
- Day 2  Read pgs. 150-152; 186-189 in Houghton-Mifflin Ancient Days for
background on the geography of Egypt and Mesopotamia. Show a short PowerPoint presentation on the geography of these regions.

- Day 3 Using maps on pgs. 151 and 187 in Houghton Mifflin *Ancient Days*, students will complete their own map labeling rivers, mountains, deserts, regions, cities, and seas in Egypt and Mesopotamia. They will discuss where cities developed and why. They will complete a compare and contrast graphic organizer looking at the similarities and differences of the geography in these two regions. (see attached map and compare and contrast graphic organizer)

- Day 4 Working in groups students will create a timeline beginning with the Archaic Period and ending with the Graeco-Roman Period.

- Day 5 Read “Saba the Farmer” aloud and then as a Readers Theater. Discuss the gifts of the Nile’s flooding.

- Day 6 Students will view a short PowerPoint presentation on the agricultural techniques that helped early farmers produce surpluses. Students will read about simple machines: screw, pulley, wheel and axle, lever, wedge, and inclined plane. They will read when they were developed, and how they were used in the development of agricultural technology. (See attached readings).

- Day 7 Students will read about the domestication of plants and animals and how all of these developments contributed to the growth of cities in *A Message of Ancient Days* on pages 122-126. (See attached readings as well).

- Day 8-12 Students will begin writing an expository paper on the gifts of the Nile and how these gifts led to the development of the Egyptian civilization, or they will trace development of agricultural techniques in Mesopotamia and Egypt and explain how these developments led to the building of cities.

▸ Some lessons may take longer than one day to complete.

**Evaluation:** Students will write a one page, 3 paragraph expository paper describing in detail the gifts of the Nile and how they contributed to the development of the ancient Egyptian civilization or they may write their paper tracing the development of agricultural techniques in Mesopotamia and Egypt and explain how these developments led to the building of cities.
<table>
<thead>
<tr>
<th>Vocabulary for Water, The Life Blood of the Desert</th>
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<td>agriculture</td>
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<td>fertile</td>
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<td>shait, the season of inundation</td>
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<td>shemu, the season of harvest</td>
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<td>piruit, the season of emergence</td>
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What Makes a Civilization?

The earliest people traveled in loosely organized bands of hunters and gatherers. They carried their homes with them as they looked for areas where there was plenty of water, game, and edible plants. They moved on when these resources became scarce where they were.

The Middle East region from the Mediterranean Sea to the Tigris and Euphrates Rivers was a sort of paradise. This strip of crescent-shaped land had such abundant water and rich soil that it came to be known as the Fertile Crescent. Here, people were able to stay in one place for months at a time. This meant they could build lasting homes.

As people began to settle down, they learned more about their environment. They learned about the conditions that made plants thrive. They learned to protect and raise animals. Eventually, they learned to grow crops and domesticate animals by controlling their growth and behavior. Farming and herding provided a new, more stable way of life. Agriculture was born, and its development changed history.

Now fewer members of a group were needed to provide food for everyone. This allowed people to explore other areas of interest. The division of daily labors and advances in new technology such as building, craft making, and toolmaking made life easier and allowed more time for organizing government and religion.

By 3500 B.C. small farming communities in the Fertile Crescent were developing into cities, marking the rise of civilization. These complex societies shared the following characteristics:

- They domesticated plants and animals. This gave them a stable food supply and the ability to store surplus food to use during lean months. They were able to adapt to their geography and climate by creating irrigation systems which brought water from a nearby river or lake when there was not enough rain.
- They had specialized labor so that people learned different trades. People depended on each other to make the community and their families function well. People traded, or bartered, goods and services with others.
- They developed a system of government to organize the community and create laws. Leaders emerged whose skills helped them organize work and enforce rules.
- They divided the community into social levels or classes. Some people were wealthier than others. Social status depended on what a person owned, his or her occupation, and his or her relationship to the religious or governmental leaders.
- They developed a more complex culture that included art, architecture, music, religion, and law. Many civilizations also developed advanced language and writing systems.
BONES FROM THE DISTANT PAST: 
THE NEOLITHIC REVOLUTION

The archaeologist took out his small brush and carefully removed the remaining dirt from the fragment of human skull. To help him reconstruct the life of the long-dead human, he could look at the other artifacts found in the grave. There were broken pieces of roughly-formed, earth-colored pottery, a stone pick-ax for tilling the soil, sheep bones, and tiny clay beads. Based on the evidence, it seemed likely that this human must have lived during the Neolithic Age.

Scholars still debate over the origins of human society, but most agree that sometime before 10,000 B.C. the Neolithic Revolution occurred. Neolithic means "new stone age." This refers to a change in the way of life of early man from mobile hunting and gathering to settled agriculture in villages. An important part of the explanation for this change has to do with the climate. The earth became warmer around this time, and new kinds of animal and plant life flourished. Humans learned that they could be assured of food by planting wild wheat and wild barley. They also learned to domesticate animals like dogs, sheep, and horses. The wild wheat and barley were so easy to harvest that there was no reason to move on in search of food. People began to live permanently in settled villages. It is hard to know how early Neolithic farmers divided the labor, but archaeologists believe that women played a crucial role in the discovery and development of agriculture.

Life became even easier with new inventions like pottery, which was discovered in Iran around 6500 B.C. Others invented weaving in what is now modern-day Turkey. Still others nearby began to use crude carts on wheels to haul food. Now Neolithic humans could store food from year to year and build up surpluses.

With extra supplies some people could also specialize in certain skills, like making pottery or beads or tools. Earlier discoveries could be refined. For example, potters began to decorate their work with beautiful designs. They also experimented with new shapes and materials. The discovery of the potter's wheel enabled the potter to make jugs, dishes, and containers much more easily. Where before a pot would take days to make, now it took only minutes.

Others specialized in knowledge of the climate and the changing seasons so important to farming communities. Because these things seemed mysterious to the rest of the community, these men in time were respected as magicians or priests. At the same time,
certain farmers expanded their holdings and gained power over others. Because of these changes, new social and economic classes emerged. With these advances also came new needs and further outlets for human creativity. As society became more complex, there was a greater need to record and pass on information. Thus, writing was invented, and with it came civilization.

At first Neolithic humans lived in caves or huts made of mud, reeds, or logs. These early dwellings were grouped in small, open villages. The purpose of the village was to form a community of workers who could share the jobs of planting, sowing, and harvesting crops and caring for livestock. The Neolithic age was a dangerous time to live, however. Predatory animals and humans might attack the herds or steal the precious food supplies. Therefore, farmers formed larger communities where they could help to protect each other and their livelihoods. Remains of Neolithic villages have been found all over Europe, Africa, and Asia. However, the most extensive remains of Neolithic villages and towns appear in the Middle East.

One of the best-known of these sites is the Neolithic town of Jericho in Palestine near the Dead Sea. The town dates back to at least 9500 B.C. The inhabitants built massive walls for protection against invaders or floods. They also constructed a great tower 28 feet tall and 33 feet in diameter. To accomplish such a feat, the inhabitants must have been well organized and disciplined. They also built structures for religious practice. Here, statuettes of an Earth Mother have been found. The inhabitants worshipped her in the hope that she would make the land fertile for agriculture. Archaeologists estimate that around 2,000 people lived within the enclosed 13-acre town. There, they cultivated barley and wheat, domesticated goats, and traded salt for obsidian and turquoise.

It is important to remember, however, that development and change occurred at a very slow pace. At least 5,000 years separated the beginning of the Neolithic Revolution from the first civilization. The next important stage of human development occurred elsewhere in the Middle East, in a land between two rivers that the Greeks called Mesopotamia.
THE DAWN OF CIVILIZATION

What is civilization? It is not easy to define, but archaeologists look for certain characteristics that, if present, suggest a civilized society. First, they look for evidence of a hierarchy. In a hierarchy different social classes possess different privileges. Those in the wealthier and smaller social classes have more power than the more numerous but poorer classes "below" them. In fact, the upper classes usually rule over the lower classes.

Other characteristics of civilization include formal political and religious institutions, monumental architecture, and finally, writing. The first civilization that we know of emerged between 3500 and 3000 B.C. in Mesopotamia. This is the name for the Tigris-Euphrates River Valley of modern-day Iraq. The people who founded the first civilization are known as Sumerians. The climate of ancient Sumer, like that of modern Iraq, was harsh. Summers were hot and dry, but spring brought too much water with yearly, unpredictable flooding. Historians like Arnold Toynbee believe that it was the challenge of living in this harsh environment that led the Sumerians to create civilization.

The Sumerians had to learn to build reservoirs to save the flood waters, as well as irrigation systems to channel the water out to the fields during the dry summers. To accomplish this daunting task, they needed centralized direction and cooperation. They also needed specialists who could plan and supervise the engineering projects. Other experts were needed to study the stars and predict the yearly floods. Hence, Sumerian society began to develop a hierarchical structure. Not only did the Sumerians learn to manage the precious water, but they also developed important technological breakthroughs like the wheel and the plow. New kinds of food were introduced, like dates, figs, and olives. These improvements in agriculture meant that farmers produced more than they could eat.

As they were making strides in agriculture, the Sumerians were also finding new ways to work with metal. At the end of the stone age, humans were already making tools and weapons out of copper. In Mesopotamia, however, they began to discover that if copper was melted and mixed with tin, they could produce a new metal that was still easily shaped but was stronger than copper. The new metal was bronze. It made a much sharper and more dangerous weapon as well as a more useful tool. As a result, those in Sumerian towns built walls to protect themselves from these new weapons, but also constructed monumental buildings with the more efficient bronze tools. Historians consider the discovery of bronze
so important that they call the following 3,000 years the Bronze Age. 

Sumeria was becoming wealthier but also more complex. There were serious problems in managing this changing society. To solve these problems, historians suggest the Sumerians invented writing. At first they kept records by means of tiny clay tokens that represented the objects being counted or traded. However, by 3500 B.C. the system had become unwieldy. It was easier for people to use signs on clay tablets to indicate numbers instead of amassing piles of tokens. Signs were scratched on wet clay tablets that were dried in the sun and then baked in an oven to harden. Thus, writing was born. In time, new words were added through pictographs. Pictographs are simplified pictures that stand for a particular object. Eventually, these evolved into ideograms, which are symbols that are no longer recognizable as specific objects but denote ideas. For example, a picture of an ox would have originally represented just an ox. Later, however, it might be transformed to represent the idea of work. When the Sumerians combined two or more such ideograms, it was possible to communicate more complicated ideas without creating new pictures.

As the centuries passed, these symbols evolved into signs that often looked little like the original pictograph, but the signs became standardized into Sumerian. However, they didn't develop an alphabet where symbols stood for sounds. That came much later. Sumerian pictographs were later learned by neighboring people who adapted it for their own languages. Thus, writing began to spread in the Middle East.

Sumerian was written with a reed stylus, or point, shaped like a triangle. This made wedge-shaped marks. Scholars usually call Sumerian pictographs cuneiform because the Latin word for wedge is cuneus. Writing Sumerian cuneiform was clumsy and time consuming, and only rigorously-trained scribes had the skill to do it. Nevertheless, writing had a profound effect on Sumerian life. Now economic and commercial records could be kept, along with details of offerings to the gods, important events, and even poetry. After 3000 B.C. historians can learn about the Sumerians in their own words. Armed with their writings and archaeological evidence, we can construct a good estimate of what life was like for the Sumerians.
THE GIFT OF THE NILE:  
THE RISE OF  
ANCEINT EGYPT

At the beginning of the history of ancient Egypt is the mystery of the Narmer Slate Palette, the oldest surviving image of an historic person identified by name. On one side, it shows a mighty king wearing the crown of Upper Egypt, the area to the south of the Nile Delta. He is about to kill a bearded enemy while others flee. To his right, a falcon, the symbol of Upper Egypt, holds the head of a vanquished foe while sitting upon papyrus reeds in the shape of the Nile Delta. On the other side, a king wearing the crown of Lower Egypt, the area of the Nile Delta, marches in procession preceded by four standard-bearers and an important official. Dead bodies with their heads cut off are piled to his left. Below that scene, two beasts with serpent-like necks intertwine, and below that a bull destroys a city. What do these symbols mean? It is impossible to know for sure, but many archaeologists believe that it commemorates the conquest of Lower Egypt by Upper Egypt, thus uniting Egypt under one ruler.

Archaeologists also know that around the same time, monumental architecture and writing appeared. It is uncertain whether the Egyptians invented these things or learned them from the Mesopotamians. In any case, by 2700 B.C. the Egyptians had created the sophisticated and vibrant civilization of the Old Kingdom. Historians have divided Egyptian history into three distinct eras: the Old Kingdom (2686–2160 B.C.), the Middle Kingdom (2040–1633 B.C.), and the New Kingdom (1558–1085 B.C.). The eras are divided by years during which the central government broke down. These spaces between the kingdoms are known as Intermediate Periods.

The ancient Greek historian, Herodotus, described Egypt as "the gift of the Nile." His statement is accurate. Like Mesopotamia, Egyptian civilization was shaped by its close proximity to a river. Egypt was also dry and relied on irrigation to collect and distribute water. The Nile served as an avenue for transport to Egyptian cities. Here food, fuel, and the building materials that were used to construct the pyramids could be transported. Water from the Nile could also be channeled to arid lands away from the river all year long. Almost all Egyptians lived in the narrow belt and fan-shaped delta of fertile land shaped by the Nile. Because the river runs from south to north, the Egyptians called the land in the south Upper Egypt, while the delta in the north they called Lower Egypt. Egypt and Mesopotamia are different, however. Unlike the dangerous and unpredictable Tigris and Euphrates, the Nile is remarkably regular. Its annual floods were not only predictable, but were looked forward
to by the Egyptians to bring water and fresh, black soil from upriver to rejuvenate the land. As a result, Egyptian agriculture was the most successful of the ancient world. Much later, when Egypt came under the control of Rome, the Romans relied on the abundance of Egyptian agriculture to feed much of the Roman Empire.

The Egyptians enjoyed other advantages as well. Egypt was rich in natural resources. The stems of the papyrus plant, which grew along the banks of the river, could be dried and pressed to make a kind of paper. Copper and turquoise were abundant in the Sinai peninsula and gold could be found in the desert east of the river. Finally, limestone, which was so important for the many building projects, was quarried in Lower Egypt. The Nile River is protected on the east and west by deserts too vast for most invaders to cross. Thus Egypt developed a homogeneous civilization of its own, developing without much outside interference. Although the Egyptians traded with Mesopotamia and Syria, there is little sign that this contact affected Egyptian culture. Nor did Egypt suffer from chronic warfare over scarcity. In Egypt there was plenty of water and rich farm land. Because of these advantages, the Egyptians were more optimistic than the Sumerians. For instance, they believed in an afterlife as good as, if not better than, the present. Each year the Nile brought new life to Egyptian agriculture, so they believed death must only be a brief season before an afterlife in the next world. Historians also believe that faith in the static or unchanging nature of life helped to promote the idea of a single, all-powerful king who watched over his people and gave them all they needed. He was known as the pharaoh. This ruler supplied Egyptians with a strong central government, an elaborate bureaucracy to manage the complex irrigation system, and a living symbol of order to worship. The stability of life also gives Egyptian history remarkable continuity. Religion, fashion, language, art, and social tradition remained basically unchanged. A day in the life of an Egyptian during the reign of king Narmer was very similar to a day in the life of an Egyptian living almost 3,000 years later at the end of the period we call ancient Egypt.
Make a Map

Refer to a map of Egypt to color and label the map on this page, using the guidelines given. Make a map key to show what the colors and symbols represent.

**Color and label these geographical features:**
- Mediterranean Sea (blue)
- Red Sea (blue)
- Nile River (blue)
- Nile Delta (brown)
- Arabian Desert (yellow)
- Libyan Desert (yellow)
- Fertile Valley (green)
- cataracts (red)

**Label these regions:**
- Upper Egypt
- Lower Egypt
- Nubia

**Locate these cities with a star and label them:**
- Cairo
- Heliopolis
- Giza
- Memphis
- Akhetaton (Tell el Amarna)
- Abydos
- Thebes
- Luxor
- Valley of the Kings
- Aswan
The map below shows an outline of ancient Egypt. Learn more about this country by labeling the map with the following: Delta, Mediterranean Sea, Nile River, Red Sea, Lower Egypt, Upper Egypt. Color all bodies of water blue, the deserts tan, and the farmland green.

* Compare a current map of Egypt with the map above. Are there any changes?
Directions: Divide the tasks among students in your group so you can all work at the same time. Use the materials your teacher provides.

1. Starting at a short end of a piece of construction paper, fold it into 8 equal horizontal bars or pleats. Each pleat will be about 2” (5 cm) long.
2. Make an Ancient Egypt time line by labeling the pleats in 100-year spans. Label the first pleat 3000 B.C., the second one 2900 B.C., etc., until you get to A.D. 700. (Remember that B.C. dates move back in time and A.D. dates move forward.)
3. Tape the pleated papers together to form a complete time line.
4. Cut apart the period blocks on the chart (pages 6–8) and color each one a different color.
5. On the time line, color the span of time each period covered in the same color as the period chart. Estimate where one period ends and another begins within a 100-year span (pleat).
6. Glue the period blocks onto the time line in the appropriate place. Display the time line in your classroom.

### The Archaic Period
**Ruler of Two Lands—3000 B.C.–2700 B.C.**

- King Menes (Narmer) unifies Upper (white crown) and Lower (red crown) Egypt.
- Memphis becomes the capital of Egypt.
- People begin using hieroglyphics to write.
- The earliest known textbook about surgery is written.
- Achievements include using stone masonry in burial chambers, using baking pots and bricks in kilns, and building irrigation and drainage ditches.

### Old Kingdom
**Age of the Pyramid Builders—2700 B.C.–2180 B.C.**

- The first pyramid, the step pyramid, is built for King Zoser (Djoser) near Memphis by his chief advisor, Imhotep.
- The Great Pyramid of Giza and the Sphinx are built for King Khufu (Cheops).
- Egyptians travel into and settle Nubia.
- The god Re becomes important.
- King (pharaoh) is believed to enjoy eternal life.
- Achievements include adoption of the 365-day calendar, boat building, wood and stone sculpture, art, literature, and embalming.

### First Intermediate Period
**2180 B.C.–2133 B.C.**

- Government breaks down. Egypt is divided into many small, warring kingdoms, each with a different ruler.
- Pyramids, tombs, statues, and temples are looted and destroyed.
Chart of Ancient Egypt’s History

The Middle Kingdom
Two Lands Reunited—2133 B.C.–1633 B.C.

- Egypt is reunified by Theban rulers. The empire moves farther into Nubia.
- Trade increases with Syria and Mesopotamia.
- Cataracts are built along the Nile to provide trading posts and fortresses.
- A canal is built connecting the Nile River to the Red Sea.
- The gods Amon and Osiris are worshiped by many.
- The earliest schools are established.

Second Intermediate Period
1633 B.C.–1567 B.C.

- Egypt is conquered by Hyksos and Asiatic people, whose overthrow creates many different rulers.
- The Hyksos introduce the horse drawn chariot, the use of bronze, new weapons, and improved spinning and weaving techniques.

The New Kingdom
Age of a Powerful Empire—1567 B.C.–1085 B.C.

- Egypt dominates the Ancient World. Thebes becomes the capital of Egypt.
- Thutmose I–IV rule, expanding Egypt’s domination south throughout Nubia and Kush.
- Gold, slaves, and other African commodities such as ivory, ebony, ostrich feathers, and perfumes become key elements of Egyptian economy.
- Queen Hapshetsut reigns as the first female pharaoh. During her rule Egyptians create the famous obelisks and other beautification projects.
- King Amenhotep IV introduces the worship of only one god, Aten. He moves the capital to Akhetaton (Tell-el-Amarna) and changes his name to Akhenaten. He marries the famous and beautiful Queen Nefertiti.
- Prince Tutankhaton marries one of Akhenaten’s daughters. Once Akhenaten dies, Tutankhaton becomes king and changes his name to Tutankhamen. He abandons the worship of only one god and restores Egypt to polytheism. He moves the capital back to Thebes.
- Kings Ramses I–XII rule Egypt, but their power is declining. Ramses II builds Abu Simbel and other great temples in Nubia.
### The Late Period
**A Time of Foreign Rulers—1085 B.C.–332 B.C.**

- Egypt's power declines. Kush becomes strong and conquers Egypt. Egyptian religion and government deteriorate.
- The Assyrians invade Egypt. Greece helps Egypt regain independence.
- The Greeks explore and trade with Egypt.
- Crafts, especially metalwork, flourish.
- The Persians invade and conquer Egypt. The Greeks help liberate Egypt again.

### The Graeco-Roman Period (Ptolemaic Period)
**The End of Egyptian Culture—332 B.C.–A.D. 641**

- Alexander the Great from Greece conquers Egypt and establishes Alexandria as the capital and learning center.
- Ptolemy Soter, one of Alexander's generals, founds the Ptolemaic line of 15 rulers that ends with Cleopatra.
- Cleopatra, the last Egyptian queen, attempts to gain power for Egypt with the help of Julius Caesar of Rome. Caesar is killed by Romans who fear he is giving Roman power to Egypt.
- The Roman Provenances are divided between Caesar's friend Mark Antony (who some believe was Caesar's son) and Caesar's nephew Octavian.
- Mark Antony falls in love with Cleopatra and takes control of land to the east, including Egypt. He and Cleopatra marry and live in Egypt.
- Octavian, now known as Augustus Caesar, wants all of the Roman territories. He defeats and kills Mark Antony. In love and grief, Cleopatra kills herself with a poisonous snake.
- Egypt comes under Roman rule. Christianity becomes the main religion.
- Egypt becomes a Muslim nation under the rule of Arabs and the Islam religion.
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Saba the Farmer

Narrators 1–8
Nebu, his son
Saba, the farmer
Mara, his wife
Setu, his friend
Hada, his friend
Tika, his daughter
Ptah, a peasant

Narrator 1: Ancient Egyptian life centered around the life-giving waters of the Nile, the longest river in the world. Many other African rivers and marshlands feed into it on its 4,150-mile journey northward to the Mediterranean Sea. As the river approaches the sea, it comes to a head, where it divides into many small channels and streams that form a triangle of marshy land called a delta.

Narrator 2: In ancient times, the delta contained seven mouths, or flows, that emptied into the sea. Today there are two main mouths—the Rosetta on the west and the Demietta on the east. Cairo, the capital city of modern Egypt, sits at the head of the delta. Listen now, as we go back in time to Ancient Egypt to hear the story of one farmer who lives and works along the banks of this great river.

Saba: Hello. My name is Saba, and I am a humble farmer who works the land to provide for my family. I live in a small village north of Thebes, the capital of Egypt. My village is very near the Nile, in the area known as the fertile valley. All of us who live in Egypt, from the poorest peasant to our wealthy king, the pharaoh, depend upon the Nile. My friends Setu and Hada will help explain why the river is so important to us.

Setu: If you look at a map of Egypt, you can see that most of the land is desert. The Arabian Desert to the east and the Libyan Desert to the west are both part of the Sahara, a vast desert that covers much of northern Africa. Few people live in these desert regions because crops will not grow. Indeed, the only land with soil able to grow crops lies along the banks of the Nile. This narrow strip of land is what Saba referred to as the fertile valley.

Hada: The fertile valley replenishes its rich soil each year when the Nile floods. We consider the flooding an annual miracle. Without it, we would be unable to farm, for the land would be barren desert like the rest of Egypt. In gratitude we worship H'apy, the god of the Nile, who provides us with food and is the creator of all good.

Saba: Some years there are “high Niles.” During these years, crops grow well and there is plenty to eat. In other years, the flood waters are low. The fields are baked by the sun, dry out, and are worthless for planting. If several years of low water occur in a row, we cannot grow enough food, and people starve.
Saba the Farmer (cont.)

Setu: When Egypt was suffering through seven years of famine because of low flooding, King Zoser from the Old Kingdom turned to his advisor Imhotep for help. Imhotep said they needed to learn the name of the Nile god who controlled the floodgates so they could ask him to send more water to Egypt. It was believed that the god of the Nile slept in two caverns below a temple at the southern tip of Egypt. Then the Nile god, H'apy, came to King Zoser in a dream and said he would flood the land if the people would worship him. King Zoser made it so, and a high Nile ended the famine. Later, Imhotep furthers the fame of King Zoser by building the first pyramid in Egypt for him.

Narrator 3: Egypt gets almost no rain. The myth of King Zoser was a way for people to feel they could influence their fate. We now know that the right weather conditions must occur in other parts of Africa for the Nile to flow and flood. At the end of winter, snow on the mountains of central Africa melts and runs into the small tributaries that feed the Nile. Spring rains are followed by summer monsoons, swelling the Nile and its tributaries. Join us as we walk through the farmlands before the flooding begins in early August.

Nebu: Hello, Father and friends! I am working hard to finish the harvest and repair the farming equipment and irrigation canals. As you know, we cannot predict when the flooding will begin. I am hoping the yearly inundation will not be too little or too great. If the waters do not rise high enough, some farm land will remain barren. If the flooding is too great, our irrigation system, our home, and other buildings may be damaged.

Saba: We were fortunate to have a high Nile last year, and our crops were bountiful, as you can see. The floodwaters carried great amounts of alluvium, or silt, which greatly enriched our soil when the flooding receded. We can only hope it is the same this year. We will keep an eye on the Nilometer.

Narrator 4: A Nilometer is a measuring device used to help predict the height of the coming flood waters. Notches are made along the stone walls of the Nile channels to mark previous flood levels. Priests read the water level at the beginning of the year and compare it to an average year. This comparison allows people along the banks to decide whether or not they need to move their houses and livestock to higher ground and to better prepare for the planting season.

Nebu: Father, your workers are preparing the land for the flooding. Please check that they correctly dig the channels from the river that form our irrigation system. I will then make sure that they are cleaned out properly so water can run through them with ease. I believe Ptah is helping build an earthen dike.

Saba: Hello, Ptah. How is the work progressing under this hot sun?
Ptah: Greetings, Saba! The work is difficult, but if you are prepared and have a good growing season, it benefits us all. The many dikes or dams we build will hold the water when the floods start receding. They must be in good working order. It will be too late to repair or rebuild them once the inundation has begun. During the flooding, the channels are opened. They are closed once the river has reached its maximum height. The checkerboard of fields can then be drained or irrigated as needed during the rest of the year. This is a very complicated system in which every member of the village community plays a role. I am doing my part.

Narrator 5: Like Ptah, most of the men who work for Saba are peasants. However, he also has a few male slaves who help on the farm and some female slaves who work in their house with his wife. They are treated well in exchange for hard work, loyalty, and honesty. Slaves who have worked diligently for a long time are sometimes given their freedom.

Saba: Let us go to my house. I believe Mara is working with the slaves to weave some of the flax from the harvest. Tika is also there, sorting the grains to preserve seeds for planting and to store those we will use for food.

Narrator 6: Saba and his friends head toward his house, a structure of sun-dried bricks. The walled courtyard contains silos of grain. They pass some herds of animals and enter the courtyard where Tika is sorting grains at the silos. Geese and goats roam freely and eat grain that slaves provide. On the upper deck under a thatched roof, Mara weaves on a loom. She comes down to greet her husband and guests and sends a slave girl for refreshments.

Mara: Greetings, husband and honored guests. How are things in the fields?

Saba: It is hot and laborious work preparing for the inundation. But we had a bountiful harvest.

Mara: Yes. We grew a variety of crops this year. Wheat and barley are being ground to make the bread and beer you enjoy with your meals. The flax harvest was abundant. Even after discarding the older plants whose fibers are too tough to weave, we had plenty of young plants to provide us supple fibers for cloth and sitting mats. We will soon make ropes and heavier fabric to use in the fields.
Saba: Ah, here are the refreshments. Tika, come join us. Mara, send someone to fetch Nebu. It isn’t often we have guests in the middle of the day.

Setu: I understand you also have a garden near your home.

Mara: Yes. Our house has been built far enough away from the river to be out of reach of the flooding, but irrigation channels have been dug so that there is a supply of water to the house and garden. We grow different fruits and vegetables in the garden, and I am especially proud of our vineyard. Most of the grapes are used for making wine, although we pick some for the table. You are eating some that have been dried into raisins. We also grew the figs and dates you are enjoying.

Tika: It is so pleasant sitting here overlooking the fields. Every season brings something new and exciting. I like the way we divide the seasons so that they are not based on climate but on the flooding of the Nile.

Narrator 7: The Ancient Egyptian year begins in June, and there are three seasons. The first season is known as shait, or the season of inundation. From the middle of July through October the waters of the Nile rise, bringing with them the precious silt that makes the soil fertile.

Tika: Shait is my favorite time of the year. There is not much work on the farm when our fields are flooded. I like to go to the banks of the Nile and watch as the farmers float blocks of limestone across the swollen river to use for pyramids for the pharaoh. It seems like hard and dangerous work.

Saba: I, too, enjoy the season of inundation and look forward to the months ahead. During these months I travel by boat to check my fields and arrange other work. Sometimes the tops of the dikes remind me of a well-traveled roadway running through the water and leading me to a new adventure in trading, bartering, and meeting new people. I may even be commissioned to help with one of the pharaoh’s special building projects.

Nebu: I prefer the time of the year when the water starts to recede. During piruit, the season of emergence, the soil is ready for planting. This brings much work but also many new possibilities. The channels will be filled with water, and we will plant a new series of crops.
Saba the Farmer (cont.)

Narrator 8: The planting is not easy work. First, the soil must be broken up. They used a plow called a mattock. The soil can be very heavy after the flooding, and the plowman must be strong to keep the blade down as it cuts. Then the farmers scatter barley or wheat seeds over the field, and they are plowed under. Finally, a herd of goats or sheep will be driven over the field so that their hooves can firmly embed the seed into the ground.

Nebu: Once the crops are sown, we move on to land farther away from the river. This is the first soil to dry out, and so we must make sure that the channels and ditches that carry water to this land later in the year are clear of any debris, such as trees or branches.

Narrator 9: Sometimes farmers use a shaduf to raise the water over the Nile’s bank to the higher level of the channels. A shaduf is a type of lever made from a pole on a pivot. There is a clay weight on one end that balances a bucket on the other end. It makes it easier for farmers to collect water from the river to pour into the irrigation channels.

Nebu: From October through February we will care for our plants as they grow. This is an exciting time of the year when we see whether new irrigation and planting techniques have been successful.

Hada: Nebu will make a fine proprietor of your lands, Saba, once the great gods carry your body off to the afterworld. Although there is great satisfaction in watching crops grow, there can also be problems. Birds and insects are a continual hazard. In my own fields I often have small boys make noises to frighten the winged beasts away. Sometimes we try to catch birds with a flaxen net. We then kill them for food. Insects are a different matter. What can you do?

Setu: Nebu and Tika were too young to remember the devastation caused by the plague of locusts. The whole sky was blackened by the insects, and they ate everything in their path.

Saba: And storms and gales can also damage a crop beyond repair. However, despite all of these difficulties, it is rare that my land doesn’t provide more than enough for my family to eat—and even provide a surplus that I can sell. The land of Egypt truly is the gift of the Nile.

Hada: That is why I like shemu, the season of harvest, when the crops are gathered by all members of the family and great feasts are planned. Watching the ripe grain being cut by the reapers swinging their curved wooden sickles with flint teeth is almost like watching a dance.
Saba the Farmer (cont.)

Narrator 10: Harvested grain is taken to the threshing floor where oxen trample the stalks, leaving chaff and grain that workers will winnow, using wooden trays. As the workers throw the grain and chaff into the air, the chaff blows away and leaves the precious grain behind. Donkeys carry it to the granaries and family silos. From February until the end of May, everyone is busy harvesting and selling their wares. This is the time of the year when the Nile is at its lowest.

Saba: Yes, and the time for getting another visit from the tax assessors, eh? I always make sure that my land is well marked with clear boundaries. This is an urgent task once the flooding has receded. Later the tax assessors will come to estimate the yield of my crop so they can calculate the taxes that have to be paid. Then, during the harvest, they return to collect my tax payment. Many is the time that I have seen disputes as landowners argued over the boundary or title of the land once the tax assessor arrived. Sometimes I pity the assessors, for they are often harassed and their lives made difficult. No one likes to give away part of their crops as a tax payment.

Mara: I feel truly thankful for all of the gifts the Nile brings to our family. Not only does it provide rich soil for growing crops but it also gives us fish and fowl for our table. The Nile nurtures papyrus, the long, thin reed that grows wild along the riverbanks. Saba and Nebu use it to build boats. I use papyrus to make baskets, sandals, and lightweight paper. How fortunate Egypt is to be the sole provider of this valuable and sought-after writing medium.

Tika: And don’t forget how useful the Nile is for transportation and trading. The Nile is Egypt’s main highway. In six places cataracts have been built to fill the river full of rocks. This creates ports for trade since it slows down the boats and makes it difficult to travel.

Saba: Yes, and the Nile also provides us transportation to the afterworld. During the funeral processions to the Valley of the Kings, the deceased and his possessions are floated across the Nile to be buried in a secret tomb. It is truly amazing, the number of ways our lives depend upon and benefit from this marvelous river.
Saba the Farmer—Vocabulary and Comprehension

Write the following words on the chalkboard for students to copy on index cards for their picture dictionary. Remind them to research and write a complete definition, explanation, or example and draw a picture.

- Nile
- irrigation system—channels, dikes
- shait, the season of inundation
- shemu, the season of harvest
- cataracts
- delta
- Nilometer
- piruit, the season of emergence fertile valley
- Mediterranean Sea
- flax
- papyrus
- locusts
- shaduf

Use some or all of the following questions for whole-class discussion, small-group work, or individual written assessment. Allow students to refer to Saba the Farmer to answer them.

1. Why does Egypt have so much fertile soil? *(from the annual flooding of the Nile)* What is inundation? *(floodling)*

2. Why does the Nile flood, and how does the flooding affect all aspects of Egyptian life? *(The Nile floods because of rain and snowmelt in other parts of Africa. When the flooding occurs, farmers can no longer work their fields. Instead they work on building projects for the pharaoh and use the swollen river for transportation and trading expeditions. The floods deposit fertile silt that revitalizes the soil.)*

3. How did the Egyptians divide the year? How is this different from our seasons? *(They divided it into the three phases of the Nile—shait, the season of inundation or flooding; piruit, the season of emergence or time for planting; and shemu, the season of harvest when the Nile is at its lowest level and crops are ready to pick. Our four seasons are based on the sun and climate changes.)*

4. Name at least three tools used in farming or irrigation. *(any three—plow, shovel, Nilometer, mattock, shaduf, and sickle)*

5. What were some of the dangers to crops? *(too much or too little water, birds, locusts and other insects, and storms)*

6. How did the cataracts affect the transportation of goods? *(They created ports for trade by slowing down the boats.)*

7. Describe an Egyptian irrigation system. *(It is a series of channels that run from the river onto the farmland. Shadufs raise water into the channels. Dikes control the flow of water to different portions of the fields.)*

8. Name at least three gifts of the Nile. *(any three—fertile soil, water, papyrus, food crops, flax for clothing and other items, fish and water fowl to eat, transportation, trade, and help for building the pyramids)*

9. Why was papyrus so significant to the Egyptians? *(Egypt was the only area able to produce and provide it to others, which meant it provided a good income because it was much in demand by many people.)*
Simple Machines

All machines, no matter how complex, are made of one or more simple machines. The six simple machines are the inclined plane, wedge, screw, lever, wheel and axle, and pulley. People use machines because they provide an advantage over doing work without a machine. When we work we use force (effort) to overcome a resistance (load). When we work, we use effort over a distance to move a load. When you lift a book from the floor to a table, you are working!

Lifting one book may not be very hard work, but what about lifting ten books? How could you lift something too heavy for you to pick up? You need something to give you more force. You need a simple machine. Simple machines can give you more force, give you more distance, or give you more speed. For example, you can walk to school, or you can use a machine—a bike. With a bike, you can use less effort over the same distance in less time. It’s easier and it’s faster.

The Ancient Egyptians understood these principles and used simple machines to do work such as irrigating, plowing, and building. Below are some pictures of Egyptians using simple machines in their daily lives. Three of them have been labeled to show the load and the direction of the effort applied. Look at the other pictures and identify the load and the direction of effort.
Load and Effort

Look around your home to find examples of any form of the simple machines below. In each box, draw a picture of the machine. Tell how you would use it by labeling and describing the direction of the load (resistance to be overcome) and the direction of the effort (force) used to move the load. Share your findings and drawings with the class.

<table>
<thead>
<tr>
<th>Screw</th>
<th>Pulley</th>
<th>Wheel and Axle</th>
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The Lever

A lever is a simple machine consisting of a beam (lever arm) that is free to rotate around or pivot on a fixed point (fulcrum). The lever arm moves, but the fulcrum doesn’t. The lever makes work easier by using force and distance to move a load. The pictures below show some common uses of levers in Ancient Egypt and today. Some of the pictures have been labeled to show the fulcrum (F), load (L), and effort (E). Study them carefully. Then label the fulcrum, load, and effort on the other pictures.

shaduf

Teeter-totter

Fishing pole

Lever to lift limestone slabs

Wheelbarrow

Bottle opener

On the back of this paper draw and label as many different levers as you can. Think of examples in the kitchen, in your garage, at school, and at play. How many different levers were you able to describe? Share your answers with the class.
The Lever Advantage

Archimedes, a Greek mathematician who lived from 287 B.C. to 212 B.C., said about the lever, “Give me a place to stand, and I will move the earth.” What do you think he meant? When you finish studying levers, you will know the answer.

The Ancient Egyptians discovered the advantages of the lever and used it in many ways. The shaduf was probably the first water-lifting machine invented. It was made of a beam balanced on a pillar as the fulcrum. A bucket hung from one end of the beam and a heavy weight hung from the other end. The person getting water would apply force to pull and lower the bucket into the water. As the bucket lowered, the weight would rise. When the person quit applying force, the weight would lower, and the bucket would rise, full of water. This simple machine is still used in Egypt today.

Another type of lever used by the Egyptians was a form of crowbar. Workers split apart slabs of limestone, using wooden wedges soaked in water. To move the slabs, they used a lever. They would stick a long wooden plank under a corner of a slab. Then, using a rock as a fulcrum, they would lift the slab by applying force to the other end of the plank.

In many types of levers, the fulcrum is between the load and the effort. When you use a hammer to pull a nail out of a board, the nail is the load, the head of the hammer is the fulcrum, and effort you use is on the handle. The handle (effort) must move farther than the nail (load), but it is easier to pull the nail out. When you pry the lid off a can of paint with a screwdriver, the lid is the load, the place where the screwdriver blade rests on the can is the fulcrum, and the effort you use is on the handle. The handle moves farther than the lid, but the lid is easier to lift off.

A teeter-totter is also a lever with the fulcrum between the load and effort. It might be too much work for you to lift your sister by yourself. But with a lever—the teeter-totter—you can. If your sister sits in the middle of her end and you push in the middle of your end, you still may not be able to move her. But if you move to the far end of your side, you can lift her. By using the advantage of a lever arm, a lighter person can lift a heavier one. You move farther than your sister, but she is easier to lift.

In all of these examples, you trade distance for effort. In other words, the effort moves farther than the load, but less effort is required to move the load than not using a lever at all. This lesson will help you better understand the advantages that using a lever to do work can provide.
The Inclined Plane

One type of simple machine used by the Ancient Egyptians was the inclined plane, or ramp. Remember that they built dirt ramps around the pyramids to enable them to pull the heavy limestone slabs into place. An inclined plane is a sloped surface. A slanted board propped up for skateboarding and a path leading up a hill are types of inclined planes. Inclined planes are used in many ways to make work easier.

Just how does an inclined plane make work easier? Inclined planes don’t move, but they can help you move or lift heavy things. Some inclined planes are very steep; others are not. You know that it takes a great deal of effort to walk or ride a bike up a steep hill. That is why roads or paths going up steep mountains or hills wind back and forth. To go straight up, you must use more effort over a shorter distance. If you take a winding road, you use less effort, but you must travel a longer distance.
The Screw

A screw is another type of simple machine—it is an inclined plane wrapped around a center post, or cylinder. A screw can be used to hold things together or to lift things. Screws are used in building, and some jar lids screw on. Some car jacks are screws that enable a single person to lift a car, and some screws bring liquids up from a lower source, such as drilling for water.

Named for its inventor, the Greek mathematician Archimedes (237-212 BCE), the Archimedes screw is a device for raising water. Essentially, it is a large screw, open at both ends and encased lengthwise in a watertight covering. When one end of the screw is placed in water and the screw is elevated at an angle and then turned, water trapped in the air pockets between the threads rises from the open lower end, up the length of the screw, and is released through the open upper end. Used over 2000 years ago by the Egyptians for irrigation, the Archimedes screw is still in use today, ranging in size from a quarter of an inch to twelve feet in diameter.