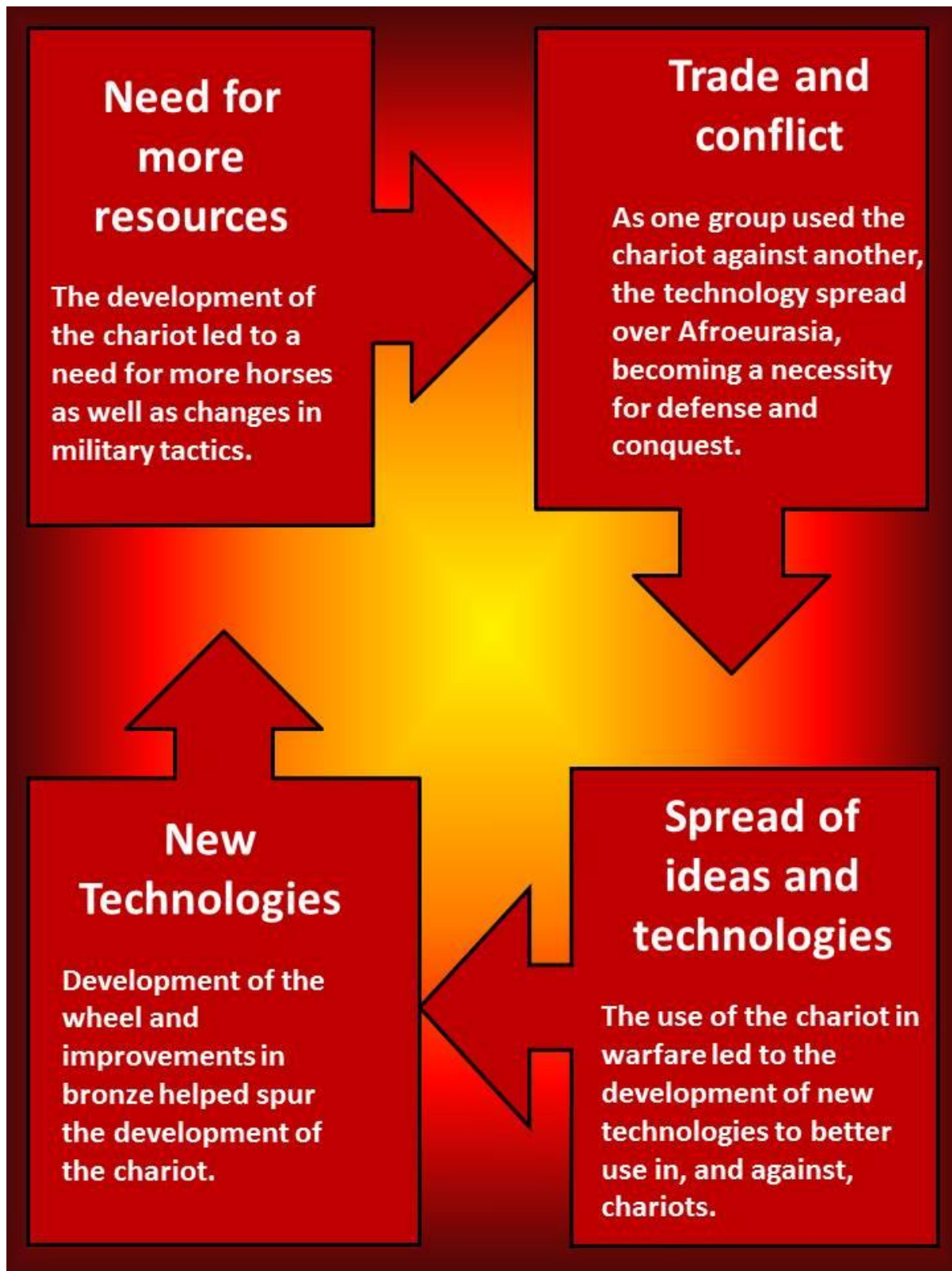


Graphic Organizer



Big Idea Card







Big Ideas of the Lesson

- During Era 2, people in Afroeurasia developed and improved important technologies. These technologies in turn transformed how people lived, worked, and interacted across societies. Some significant technological advances included pottery, plows, irrigation, woven textiles, metallurgy, and wheels and wheeled vehicles.
- In general, people developed these technologies to solve new problems, such as how to farm more efficiently, or how to better fight to defend a city. As these technologies developed, people required more resources and thus faced new problems (obtaining, using, and protecting resources) and these new problems led to further advances and innovations in technology.
- Technology and ideas were spread over large areas and expanses of time throughout Era 2 through the process of cultural diffusion.
- Historical accounts of the past can be developed by analyzing multiple sources of evidence using both historical and archaeological methods.

Word Cards

Word Cards from previous lessons needed for this lesson:

- **civilization** – Word Card #1 from Lesson 1
- **specialization** - Word Card #2 from Lesson 1
- **social hierarchy** - Word Card #3 from Lesson 1
- **intensification** - Word Card #7 from Lesson 2
- **historical account** – Word Card #13 from Lesson 3
- **evidence** - Word Card #14 from Lesson 3

<p>29 cultural diffusion</p>  <p>the process of different cultures adopted ideas and technology from other cultures over time</p> <p>Example: Cultural diffusion across the Mediterranean Sea brought the Phoenician alphabet to cultures in Europe and Africa. (SS070306)</p>	<p>30 chariot</p>  <p>a wheeled carriage powered by horses that was essential for trade and warfare throughout Afroeurasia beginning in about 3000 BC/BCE</p> <p>Example: The Hyksos were able to swiftly attack and invade Egypt thanks to chariots. (SS070306)</p>
<p>31 metallurgy</p>  <p>the art and science of producing metal goods, all the way from mining and extracting metal from mineral ores to the shaping of metal objects</p> <p>Example: Early metallurgy in human history centered upon the mining and use of copper. (SS070306)</p>	<p>32 technology</p>  <p>the use and knowledge of tools, crafts, or technical systems to solve problems and/or complete different tasks</p> <p>Example: An early human technology involved learning how to strategically use fire to clear land for different purposes. (SS070306)</p>
<p>33 bronze</p>  <p>a metal alloy (metal mixture) consisting of mostly copper, but also with tin or lead. It is harder and stronger than plain copper</p> <p>Example: Swords made from bronze became important during Era 2. (SS070306)</p>	<p>34 textile</p>  <p>cloth or fabric that is woven, knitted, or otherwise manufactured</p> <p>Example: Clothing in some areas was made from wool textiles. (SS070306)</p>

35 Bronze Age



a period after the Stone Age characterized by the manufacture and use of bronze tools and weapons made by heating and combining copper and tin

Example: During the Bronze Age, some humans created more durable tools than during the Stone Age.

(SS070306)

Student Handout 1: History of Technology PowerPoint Notes

As you view the PowerPoint and discuss different types of technology, think about how each type of technology changed people's lives. Also think about how each type of technology might have led to other changes in technology.

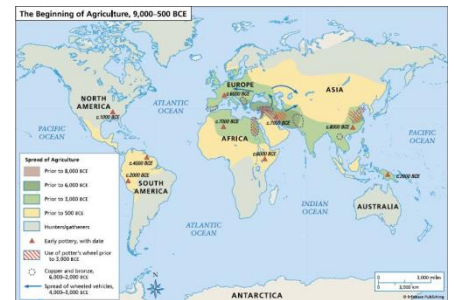
Pottery



Slide 4: Initial Thoughts: How do you think this technology changed people's lives? How might it have led to other changes in technology?

Slide 5:

1. What is this map about?
2. What seems to be the connection between agriculture and pottery?
3. How do you explain this connection?
4. What else do you notice?



Slide 6: Turn and Talk

1. In what ways is a pot a form of technology?
2. What are the possible uses of a ceramic pot?
3. What do you think it takes to make a pot?
What type of knowledge?
What type of skills?
What type of resources?

Slides 7 and 8: Watch the Video and Turn and Talk:

1. What do you notice? What was interesting or surprising?
2. Do you see anything in this process of making ceramics that relies on modern technology?
3. Could this have been done 4,000 years ago? What do you think? Why or why not?
4. Why would someone still make pottery this way today?

The Plow



Slide 9 - Initial Thoughts: How do you think this technology changed people's lives? How might it have led to other changes in technology?

Slide 10 – Stop and Jot



Slide 11: Reflection

What is a plow and how was it used?

How would it change farming?

What might we learn from these images about gender in ancient Egypt?

Slide 12:

How did the invention of the plow change people's lives?

Predict: How might it have led to other changes in technology?

Irrigation



Slide 13 - Initial Thoughts: How do you think this technology changed people's lives? How might it have led to other changes in technology?

Slide 14: Irrigation

1. Describe what you see.

2. What is irrigation and what did it do?

Slide 15: Why do you think the Egyptians depicted themselves irrigating?

Slides 16-18

1. What challenges or problems may arise from many people depending on same water supply?
2. Why did early laws include rules about irrigation?
3. How would irrigation change farming?

Woven Textiles



Slide 19 - Initial Thoughts: How do you think this technology changed people's lives? How might it have led to other changes in technology?

Slide 21:

1. What role might textiles play in a society?
2. How would you characterize the difference in clothing between the ruling elites and laborers?
3. How is this similar to or different than how people treat clothing in our society?

Metallurgy



Slide 23 - Initial Thoughts:

What is metallurgy?

How do you think this technology changed people's lives?

How might it have led to other changes in technology?

Slide 24 Stop and Jot:

How are these artifacts evidence of specialization?

What jobs and resources were needed to make them?



Wheels and Wheeled Vehicles

Initial Thoughts after Slide 25:

In what ways do you think the invention of the wheel changed the lives of people in ancient civilizations?

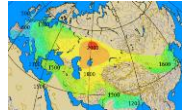
How might the wheel have led to other changes in technology?

Slide 26 Stop and Jot:

- What is a chariot anyways?
- What made it move?
- How do you think King Tut used his?

Cultural Diffusion - Our Definition (Slide 27):

Based on the map, how is the chariot an example of cultural diffusion? (Slide 28)



Slide 29



Turn and Talk:

- Why do you think chariots were important?
- How did the chariot intensify the speed of cultural diffusion?

What role might chariots played in cultural diffusion?

Slide 30 Turn and Talk Questions:

- 1) How would trade have been different before these technologies? What would have been traded and how? What would people have needed from other places?
- 2) How would conflict between groups of people have been different before these technologies? Why and how would people have fought?
- 3) So how do you think these technologies (bronze and wheels, for example) changed trade and conflict?
- 4) How do you think these technologies changed over the next 1,000 years? Why do you think they changed over time? To what extent are they still important today?

Student Handout 2: An Overview of the History of Technology

As you read about each type of technology and its development, talk to the text. In the space provided, jot down questions and connections... what does this make you think about? What questions do you have? What do you wonder?

Teacher Model- Fire: from 500,000 years ago

An event of crucial importance in the development of technology is man's taming of fire. This probably happened 500,000 years ago in China, where the caves occupied by Peking man contain what appear to be hearths. Some experts believe there is evidence of the use of fire much earlier in southern Africa.

It would be many millennia before fire is adapted for any purpose other than for warmth and for roasting meat and root vegetables. But more than 250,000 years ago hunters realized that the sharpened point of a wooden spear can be hardened by charring it in embers.

1) Neolithic technology: from 8000 BC

The technological potential of fire was not discovered until well into the Neolithic period. Pottery, fired in a primitive kiln, is known from about 6500 BC. The smelting and casting of metal requires considerably higher temperatures and are not attempted until much later, from about 4000 BC. The introduction of copper, and then bronze, brought to an end the Neolithic period.

Other basic technologies, not requiring fire, are well established in Neolithic times. Textiles appear almost as early as pottery. Weights designed to help thread spinning are common in Neolithic sites, and fragments of fine woven cloth survive in graves at Catal Huyuk from as early as 5800 BC.

2) Spinning: from 8000 BC

The spindle developed naturally from the process of twisting fibers into a thread by hand. The spun thread must be stored, and the easiest way was to wind it onto a stick while continuing to twist more fibers into longer thread. This meant that the stick was also attached to the unfinished thread (the fibers which are still being twisted). The stick must therefore twist with the fibers.

Instead of being an encumbrance, this was turned into advantage. When the stick was given greater weight, by attaching to it a lump of clay or a stone, its momentum helped in spinning the fibers into thread.

3) Weaving: from 6000 BC	
<p>Until recently the earliest known scraps of cloth were woven from wool. Dating from about 5800 BC, they come from Catal Huyuk in Anatolia. Similarly, the first known example of linen is from about 5000 BC in Egypt, where flax (an indigenous wild plant in the Mediterranean region) is cultivated. But a small woven fragment discovered in 1993 near the upper reaches of the Tigris probably pushes back the available evidence. It appears to be linen and has been dated to about 7000 BC.</p> <p>Cotton was grown in both Eurasia and America. Woven cotton from about 2500 BC has been found in the Indus valley and in Peru. The most precisely localized source of any major fabric is China, where pieces of woven silk are known from about 2850 BC.</p>	
4) The first miners: from 4000 BC	
<p>By 4000 BC deep shafts were cut into the hillside at Rudna Glava, in the Balkans, to excavate copper ore. This robbing of the earth's treasures was carried out with due solemnity and respect. Fine pots, bearing produce from the daylight world, were placed in the mines as a form of payment and appeasement to the spirits of the dark interior of the earth.</p> <p>By about 3800 BC copper mines were also worked in the Sinai peninsula. Crucibles found at the site reveal that smelting is carried out as part of the mining process.</p>	
5) Yoke and harness: from 4000 BC	
<p>The harnessing of draft animals was a major technological advance in agriculture as well as transport. The first to be harnessed was the ox, conveniently provided by nature with a fleshy hump above the shoulders. A yoke laid in front of the hump this will remain in place even when a heavy burden is pulled. Sometimes a lighter yoke is attached to the horns. Oxen were dragging heavy objects or loaded sledges by about 4000 BC.</p> <p>The camel has an even more convenient hump. Its height makes it less suitable for draft purposes than the ox, but from perhaps 1000 BC it was used in Asia and north Africa for drawing wagons and for plowing. By contrast, harnessing the horse proves problematic.</p> <p>A traditional yoke can only be kept in place on a horse by passing thongs in front of its chest. However carefully they are placed, these must pass in front of the animal's windpipe. The heavier the weight the horse attempts to pull, the less air it will breathe.</p> <p>For many centuries this meant that horses were not very effectively used as draft animals. The solution, discovered in China by the 5th century AD, was to provide a firm collar, fitting round the neck and shoulders of the animal to distribute the weight. Collars of this kind reached Europe by the 9th century AD, enabling the horse to become the main draft animal of the region for both plowing and hauling.</p>	

6) The plow and draught animals: from 3000 BC	
<p>The plow was almost certainly the first implement for which humans use a source of power other than their own muscles. When planting seeds, it is essential to break up the ground. In the early stages of agriculture this was achieved by hacking with any pointed implement - the antler of a deer, or a hooked branch of a tree. But a useful furrow for seeds can more easily be achieved by dragging a point along the surface of the ground. The first plows consist of a sharp point of timber, sometimes hardened in a flame or tipped with flint, projecting downwards at the end of a long handle.</p> <p>In the light soil of Egypt and Mesopotamia, where plowing was first undertaken, a simple pointed implement of this kind was sufficient to break up the earth and form a shallow trench. Such a plow could be dragged by a couple of men. But the use of draft animals such as oxen, from at least 3000 BC, greatly speeds up the process.</p> <p>In northern Europe, with heavier soil, this type of plow was ineffective. A more elaborate machine was developed, probably by the Celts in the 1st century BC, in which a sharp blade cuts into the earth and an angled board turns it over to form a furrow.</p>	
7) The potter's wheel: 3000 BC	
<p>When a pot is built up from the base by hand, it is impossible for it to be perfectly round. The solution to this problem was the potter's wheel, which has been a crucial factor in the history of ceramics. It is not known when or where the potter's wheel was introduced. Indeed, it is likely that it developed very gradually, from a platform on which the potter turned the pot before shaping another side (thus avoiding having to walk around it).</p> <p>By about 3000 BC a simple revolving wheel is a part of the potter's equipment in Mesopotamia, the cradle of so many innovations.</p>	
8) The wheel: 3000 BC	
<p>The wheel is often quoted as the single most important advance in early technology. It is sometimes said to have evolved from the potter's wheel. Both are first known at approximately the same period, around 3000 BC. But they share no geographical origin and it is unlikely that either form would suggest the other. Each is a natural solution to a very different problem.</p> <p>In early technology a wagon wheel could only be made from wood. Several of the earliest known wheels have been found in the heavily forested regions of Europe.</p>	

Read more:

<http://www.historyworld.net/wrldhis/PlainTextHistories.asp?groupid=1217&HistoryID=ab11&qtrack=pthc#ixzz1ur8i06HO>

Student Handout 3 – A Guided Reading on the Bronze Age

As you read, jot down answers to the questions in the boxes. You may Turn and Talk before you write, but each student has to write their own answers.

Bronze and Iron Ages

The Neolithic Age was succeeded in Eurasia by the **Bronze Age**. In any given region, the Bronze Age is considered to begin when bronze becomes a *much-used material* for tools and weapons. The term “Bronze Age” is generally not used if only a few bronze tools are being made, or if bronze is only being used for jewelry.

During the Neolithic period, humans began to make limited use of **copper** (small amounts of pure copper can be found in nature), which could be hammered or melted and cast. Later in the Neolithic period, **smelting** technology emerged in Southwest Asia, allowing copper to be extracted from copper ore. Smelting was later used for various other types of ore. These processes are part of the science and art of **metallurgy**, taking metal from rock ore and creating new goods out of it.

While copper can be used for tools and weapons, it is rather soft. It was eventually discovered that by blending copper with tin, one obtains a much harder metal: **bronze**. (Occasionally, other elements were used instead of tin.)

What was smelting?

Why was bronze better than copper?

The Bronze Age of Eurasia spanned 3000-1000 BC. Like the Neolithic period, it began in Southwest Asia, from where it spread in all directions. It took roughly a thousand years for the Bronze Age to cover the entire east-west span of mainland Eurasia, from the Atlantic (Western Europe) to the Pacific (China). Naturally, it also spread northward and southward along this span. Thus, by 2000 BC, most of Eurasia had transitioned (moved) to the Bronze Age.

While the Bronze Age also spread to North Africa, the Sahara Desert prevented it from ever reaching Sub-Saharan Africa.

How and why do you think knowledge about bronze spread?

Bronze Age Transition

Eurasia ca. 3000 – 2000
(ca is an abbreviation of “circa” which means “about” or “approximately.”)



Source: <http://www.essential-humanities.net/world-history/the-stone-bronze-and-iron-ages/>

How do you think the spread of Bronze helped to change this part of the world? Why would people want a harder metal? Make a list of possible effects.

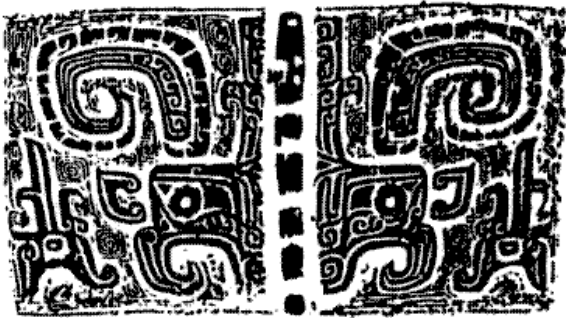
The Great Bronze Age of China: An Exhibition from the People's Republic of China (Exhibition Pamphlet)

(Important ideas are underlined!)

At about the same time that Stonehenge was rising in England and Abraham was framing the principles of Judaism in the Middle East, a Bronze Age culture was developing in China that in many respects was seldom equaled and never surpassed. This development seems to have occurred early in the first half of the second millennium B.C. in the fertile Central Plains of the Yellow River valley. For thousands of years this area had sustained Neolithic cultures of increasing complexity, which ultimately culminated in the first Chinese civilization. By the time of the Bronze Age, this culture was characterized by a strong centralized government, urban communities with distinct social classes, palatial architecture, a distinctive system of writing, elaborate religious rituals, sophisticated art forms, and bronze metallurgy.

Unlike other cultures, where bronze was first used chiefly for tools and weapons, in China this alloy of copper and tin was reserved for the manufacture of majestic vessels that played central roles in state ritual and ancestor worship for more than 1,000 years, even after the official beginnings of the Iron Age in the fifth century B.C. Representing the wealth and power of the rulers, these ritual utensils show the highest degree of technical and artistic accomplishment in early Chinese civilization.

How was the use of bronze in China different from how it was used in other places?



Detail of rectangular food caldron (fang ding) no. 32. Shang dynasty, 12th century B.C. From Tomb No. 5, Anyang, Henan Province. Institute of Archaeology, Beijing

Ancient bronzes were well preserved because of how they were stored. Sometimes ancient bronzes were placed in storage pits where they were hastily hidden by fleeing members of a defeated elite house. More commonly, however, they were used in burial and placed in tombs. During the Shang dynasty, members of the royalty were buried with their bronzes, ceramics, weapons, amulets, and ornaments. They were even buried with the human and animal entourage that surrounded them in life:

servants, bodyguards, horses, chariots, and charioteers. During the Zhou and Han periods, lavish burials continued, but human sacrifice was rarely practiced. Instead the custom was preserved by the substitution of figurines of wood or clay intended to resemble the entourage of the deceased.

So how do we know about ancient Chinese use of bronze?

Turn and Talk: Why do you think that leaders in places like China and Egypt left behind such elaborate tombs and symbols of their rule? What does that say about the nature of leadership and government in the Bronze Age?

Teacher Reference Sheet for Student Handout 1: History of Technology

As students view the PowerPoint and discuss different types of technology, push them to think about how each type of technology changed people’s lives. Below are some important points related to how people’s lives might have changed, and also how these technologies might have led to other changes in technology.

	<u>Notes from the PowerPoint</u>
Pottery (ceramics)	Answers will vary; students should note that pottery can be used to store food and other items, and also to carry water. With the ability to store food, maybe people looked to develop more types of food items that could be stored... this could have led to more cooking technology and also improvements in pottery.
Plows	Answers will vary; students should mention that plows enabled more land to be farmed in a shorter amount of time. This would allow more food to be produced, and this in turn may have led to improvements in food storage technology (pottery) and maybe even irrigation (more crops need more water). With more food produced, people could specialize even more in other areas, and there would be a need for systems to control how food was stored and shared.
Irrigation	Answers will vary, but students need to grasp the main point that technologies to bring water to planted fields were necessary for large-scale agriculture. The control of water then became very important as civilizations grew, and rules about irrigation appeared in early law.
Woven textiles	Answers will vary; students should note that textiles allowed for more creativity and cultural expression through clothing. They also could be used in other ways... part of the development of technology might have been figuring out new ways to use cloth. With cloth, technologies for making clothing would be needed as well, such as needle and thread.
Metallurgy (including copper, bronze, mining)	Answers will vary; students should note that metal tools were more efficient in many cases than stone tools, and they enabled more work to be done with less effort. Metallurgy also led to more wealth through the control of metals, and so would have led to more social divisions between people. Metal certainly changed warfare and combat and made them more deadly for larger numbers of people. With metal, new technologies for improving tools would be needed, as well as new types of metals and alloys.
Wheels and wheeled vehicles (including chariots)	Answers will vary; students should note that wheels and wheeled vehicles allowed for faster travel and more contact between people in distant places. Also, perhaps more than just transportation, wheels meant people could carry more goods with them, and thus they increased cultural diffusion. Wheels also changed combat and warfare and made chariots an important military tool. With the wheel, people could then explore new uses, like in pottery or in milling grain, and find new technologies to take advantage of this development.

Teacher Reference Sheet for Student Handout 3

A Guided Reading on the Bronze Age

What was smelting?

Smelting was the process people used to get metals like copper out of ore (rock and metal mixed).

Why was bronze better than copper?

Bronze was harder and stronger.

How and why do you think knowledge about bronze spread?

Answers may vary... students should reach the conclusion that bronze probably spread as one group learned about it from another, and then taught this knowledge to other groups. It may have been people who traveled like soldiers or traders who helped spread the knowledge of bronze. The knowledge spread because it was useful and improved the speed and quality of work people could do.

How do you think the spread of Bronze helped to change this part of the world? What good is harder metal? Make a list of possible effects.

Answers will vary... harder metal is better because it lasts longer, can do more work requiring harder surfaces (cutting wood faster; cutting people in combat; etc.). Warfare, farming, resource extraction (mining, cutting of wood) would have been effected.

The Great Bronze Age of China: An Exhibition from the People's Republic of China **(Exhibition Pamphlet)**

How was the use of bronze in China different from how it was used in other places?

Bronze appeared to have more ceremonial and symbolic uses in China. It seemed at first to be used less for new tools than to show the wealth and status of elites and rulers.

So how do we know about ancient Chinese use of bronze?

Bronze vessels and other items were buried in special tombs with rulers, and archaeologists have studied these tombs.

Turn and Talk: Why do you think that leaders in places like China and Egypt left behind such elaborate tombs and symbols of their rule? What does that say about the nature of leadership and government in the Bronze Age?

Answers will vary... students should note that rulers likely wanted to leave their mark and celebrate themselves. They also probably wanted to emphasize their power and wealth, and metal goods provided one way to symbolically show their power. Leadership and government in the Bronze Age probably had a lot to do with the control of these resources, and probably there were not a lot of people involved in leadership.