



What is a Tool?

Overview

A tool is any object that helps meet human needs. The tools that human culture has used can tell us much about their activities, food, talents, wealth, and technology. Archaeologists also find tools helpful in dating a site. Tools are a vitally important part of any society, and constantly change throughout history as cultures continue to develop new materials out of which to make tools, and new needs for tools. The following activity allows students to focus specifically on the role of tools throughout human history, and to use their own creativity to imagine tools that might be used in the future.

Objectives

Students will:

- learn about the importance of tools throughout human history
- define tools through discussions and drawings
- learn about form and function of tools, and changes over time
- observe, analyze, and interpret the historic and modern tools (some are mystery tools) provided in the kit
- explore the possible needs of future cultures
- invent new tools to serve the needs of those future cultures

Core Standards of Kit

2.2 Problem Solving Process

6.4 Historical Connections

6.6 Being a Historian

Additional Standards

2.6 Reasoning and Problem Solving/Application

2.7 Reasoning and Problem Solving/Information

7.2 Investigation

Age level

Grades 4-12/Ages 9-18

Time

2 hours



Materials in the kit

- examples of Native American, late nineteenth century, and modern tools
- copies of "Looking Carefully" worksheet

Materials provided by the teacher

- hammer
- pair of scissors
- blunt knife
- plain paper for drawing
- lined paper for making lists and writing down conclusions

Defining Tools

Background

Do animals use tools? Some do, to a certain degree. But how do animals differ from humans in the way that they use tools? After an elephant has used a branch as a tool, for example, it throws the branch away. An otter uses a different stone to open shells each day. A chimpanzee uses any stick it can find to reach ants or bananas. How often do people use new tools to do a job? What is the difference?

Procedure

1. Ask the students to list some tools that they have at home. Compare answers. Typically, students will list electrical tools used in woodworking or repair, lawn care tools, or automobile products. Note the bias. Did the students include items used in the kitchen such as a spatula or pan? How about sewing needles or pins?
2. This can lead to a discussion of the definition of tools. Students should come to the conclusion that **a tool is any object that is made or used that helps meet human needs.**
3. Now ask the students to list some tools that they use in school. Then discuss and add these to their list of tools used at home.



Form and Function

Background

The form of a tool (what it looks like and is made of) is based only in part on its function (what it does and what it is used for). Cultural preference can make a tremendous difference in the perception of the right way to make a tool.


Procedure

1. Have the students draw a picture of some of the tools they are familiar with, such as a hammer, drill, knife, kitchen pot, or sewing needle. Compare drawings. In what ways are their drawings similar to or different from one another?
2. Show examples of the Native American and late nineteenth century tools in the kit that were used in the same way as the tools that the students might have drawn.
3. Discuss why the students' drawings might be different than the actual tools in the kit. Even though the materials used and the appearance of the older tools are different than what we're accustomed to using now, these old items functioned quite efficiently for the people who used them. Even among the old items, such as the Native American projectile points, there are differences in the shape and size depending upon the skill of their makers, available materials, and popular style.

Observing and Classifying Artifacts

Procedure

1. Divide the class into four or more groups.
2. Bring in to the class a modern hammer, a pair of scissors, and a blunt knife to add to the "mystery tool" collection found in the kit.
3. Divide the modern and historic tools equally so that each class group gets an approximately equal amount of tools. Remind the students that the



historic tools are artifacts that are fragile and irreplaceable. The students should handle the artifacts carefully and respectfully.

4. Give each student a copy of the "Looking Carefully" worksheet. Using the worksheets, have the groups examine their tools, observe the special characteristics of each one, and write down their observations in the spaces provided on the worksheet.

The following is a worksheet example using the modern nail set provided in the kit:

Describe it.

Three inches long, shiny, hard, pointed at one end, blunt at one end.

What Do You Already Know About it?

It's made of metal. It was made in a factory, not by hand. It's not something I use every day.

What Does it Make You Feel or Think About?


It makes me think of a weapon. It reminds me of the dentist's office.

It looks like a woodworking tool.

What Else Would You Like to Know About it?

Would it be used at home or at work? Is it a kitchen tool? Why does it have a pointed end? Would a carpenter use it?

5. Now have the groups present their findings and compare lists. Note if there are any characteristics that some of the modern and historic tools might have in common, such as shape, size, or the materials used to make the tools.
6. Next, have the students return to their groups to classify their tools into categories. They might categorize the tools by function, but they should also try to come up with alternative methods of classification such as size, shape, color, edges, corners, etc.
7. Finally, after having observed, analyzed, and categorized them, can the groups identify any of the mystery tools?
8. Have the groups present their answers to the rest of the class.
9. Compare results.

- 
- Are some methods of classification more helpful than others? (Classifying by color, for example, would probably not be useful in trying to understand the tools or the people who made them.) Discuss how it might be more helpful to classify the tools based on how they were made or manufactured, what type of action they were used for (cutting, hitting, pulling, carrying, hole-making, etc.), if they were used to make other tools, if they were used to find food, etc.
 - Would it be easier to identify the tools if the students knew the context of each tool? (An example of this would be if the students knew whether a certain tool had been discovered in a kitchen, barn, field, etc.) Note that the more closely they resemble modern tools, the easier they are to identify.
 - As students attempt to group the tools into more helpful classifications, they will find that many tools are multi-purpose; a Native American projectile point, for example, could be used for cutting, scraping, or hole making as needed.

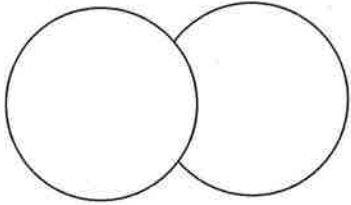
Looking at Changes over Time Using a Venn Diagram

Background

The students have now accumulated quite a bit of information about the old and the new tools that they have been studying. Next they will learn to track how the form and function of a tool change over time.

Procedure

1. Show the students the Abenaki hammerstone and the modern hammer.
2. Draw a Venn Diagram (two large intersecting circles like the example below) on the blackboard.
3. Use the left circle to represent the Abenaki hammerstone. The right circle represents the modern hammer. The intersecting area in the middle is for recording those characteristics that the two tools have in common. Have the students use what they learned in the Classification Activity and



in the Form and Function Activity to come up with characteristics. These might include the following:

Abenaki Hammerstone:

- *Heavy
- *Blunt end
- *Smooth on sides
- *Used for pounding
- *Possibly had many uses
- Round
- No edges or corners
- Made of stone
- At least two ends of the stone were used

Modern Hammer

- *Heavy
- *Has one blunt end
- *Blunt end is smooth
- *Blunt end used for pounding
- Hammerhead made of metal
- Handle made of _____
- Long
- Other end is a metal claw
- Other end used for pulling out nails
- Handle leverage allows for powerful pounding motion

What are the intersecting characteristics? Both tools are heavy and have at least one blunt end used for pounding. Both tools might have more than one use. But there are certainly more characteristics that the two tools do NOT have in common.

Hammering tools were developed to serve a human need, e.g. to pound things. Hundreds of years ago, the Abenaki people might have used their hammerstones to break things apart, to grind, to help make another tool, or to pound one thing into another, such as a stake into the ground. Over time, the hammer's main function remained the same, but the form changed as other materials were discovered that were harder than stone. And both the form and function changed further over time as the uses for hammers broadened and as human activities and needs changed.

Using the Tools to Interpret Culture

Background

Archaeologists find the study of tools to be one of the most valuable ways to interpret past cultures.



Procedure

1. Divide the tools into three groups according to the time periods when they were used: 1) **Prehistoric** (hammerstone, scraper, two projectile points, drill, gouge), 2) **Late Nineteenth Century** (darning egg, glass bottle, doorknob, stove lid grasper, pipe sherd), and 3) **Modern** (drill bit, nail set, tuna drainer, grapefruit spoon, plus the hammer, scissors, and knife added by the teacher).
2. Now divide the class into three groups. Have each group study the tools from one of the time periods. Have them consider the following questions, making a list of the characteristics of the people and the culture who used the tools:
 - What were the people like who used the tools?
 - What kinds of activities were important to them?
 - What resources were available to them?
 - How did they live?
 - How did they obtain their food?
 - What kind of food did they eat?
 - Did they have any leisure activities?

Their lists might contain many characteristics that the students arrived at by inference rather than by observation, especially the group looking at the more modern tools. Compare lists. Is making this kind of a list difficult?

4. Discuss as a class how challenging it is to picture an entire culture based only upon certain clues. Talk about how much easier it might seem to interpret the modern tools because we are describing our own culture and lives (although the students may have made some interesting and incorrect inferences in trying to interpret the modern tools that are unfamiliar to them).
5. Discuss how the modern tools and their shapes and uses can help us interpret the historic tools and the cultures of the people who used them.

Inventing a New Tool to Serve a Need



Background

The students have now learned that the form and function of tools change over time, and the tools that were familiar to people in the past are not necessarily the tools that we need today. Likewise, tools will also evolve in the future as our society and our activities change.

Procedure

1. Divide the class into small groups for this activity. Ask the students to pretend that they live at least one hundred years in the future. Have each group stretch their imaginations and make a list of some of the activities that they think will be important to the people living in that future time period.
2. Now have each group choose one of these imagined activities and invent a tool that would help them do the activity. They should draw a detailed picture of the tool, and also make a list of its characteristics and uses. They might also try inventing new materials and shapes for their tools, as well as new functions.
3. What do their new tools tell them about the future culture they have invented? Start a class discussion about whether they think their lives will be easier or more difficult than it is in the present time, based on the tools they have invented.

Evaluation

The students have begun to learn how indispensable tools are to any society, and how archaeologists study tools from the past in order to learn more about how people lived. Ask each student to write a paragraph telling which time period -- ancient, colonial, modern, or future -- they would most prefer to live in. They should base their opinions in part on the activities they would have been engaged in during those time periods, using the various tools that they learned about in this lesson.

What next?

You can now proceed to one of the next two artifact activities - "Cultural History Mystery," or the "Excavating Vermont Game." These final lessons require that the students draw on much of the background information that they learned in many of the previous kit activities.

Description of Tools From "What is a Tool?"

ARCHAIC AND WOODLAND TOOLS

(Paleo Period: 10,000 - 7500 B.C.E., Early Archaic: 7500 - 6000 B.C.E., Middle Archaic: 6000 - 4000 B.C.E., Late Archaic: 4000 B.C.E. - 300 A.D., Woodland Period: 300 - 1600 A.D.)

Drill point

Native American stone drills, especially triangular-shaped ones, are often confused with projectile points. Drills, like the one in the kit, have a broader point or a tubular end with two sharp sides appropriate for drilling. Drill points were mounted on shafts and rotated with a bow. They could be used to make holes or recesses in leather, bone, wood, or other stone.

Gouge

The gouge was highly prized by Native American woodworkers of the Archaic period. A stone was chipped to the proper size and shape, then shaped, and thinned to a hard, sharp edge at one end. A groove was made down the middle, and then the gouge was ground smooth and polished with leather and fine sand. It was used to gouge and cut wood from a tree trunk to make a canoe, and for many other uses that required a sharp-edged tool.

Hammerstone

A hammerstone was a hard, round stone used for pounding. It was also a tool that was used for making other tools: it could be used to break off small chips from a larger stone that would be thinned and shaped into a projectile point. Both ends of the hammerstone in the kit have been used, showing the roughness and pockmarks of constant, hard use.

Projectile points

Projectile point is a generic name for the stone tips that Native Americans used on their hunting tools, such as spear shafts and arrows. Made of chert, flint, quartz, or other glass-like stone, the earlier points of the Paleo Period (10,000 - 7500 B.C.E.) were less finely chipped than Archaic projectile points (7500 BC - 300 A.D.). Woodland Period points (300 - 1600 A.D.) are known for their finer chipping and smaller size. A small size indicates that a point was used on an arrow shaft rather than a spear. Triangular projectile points, made only during the Woodland Period after the introduction of the bow and arrow, were mounted in a slot at the end of an arrow shaft. After contact with Europeans, Native Americans adapted the same principle to mounting metal projectile points. The kit contains one Woodland triangular projectile point and one notched Archaic point.

Scraper

This was a stone tool used to scrape animal hides and prepare foods. Scrapers came in various sizes and shapes to suit the task (the scraper in the kit is quite small). Like projectile points, they were made of flint, quartz, or other glass-like stones. The one in the kit is quartz. A scraper is different from a projectile point in that it has only one sharp, chipped edge. The unchipped edges are generally much thicker than the edges on a projectile point.

LATE NINETEENTH CENTURY

Darning egg

Thrifty homemakers used this wooden tool to repair socks. A sock that was worn out in the heel or toe would be fitted over the "egg," allowing for a curved, hard surface on which to darn, or sew, the hole closed.

Doorknob

This mottled brown, mineral doorknob was popular from 1847 until around 1867. It is also known as an "Agate" or "Bennington" doorknob. These doorknobs were handmade by potters, and so each one may be a slightly different shade of brown and have a different degree or pattern of marbling. Other early doorknobs were made of white porcelain, jet, brass, and glass. Some of the earliest settlers' homes from the eighteenth and early nineteenth century used forged iron latches in place of doorknobs.

Glass bottle

The kit will contain one of the following two glass bottles: a small, clear, round bottle with a corked top; or a clear bottle with the imprint "3 Ounce - Sloan's Liniment Kills Pain." Both bottles probably date from the late nineteenth century, based on the mold marks on the bottle necks and their irregularly shaped lips.

Stove lid grasper

The "Never Slip Lifter," made by the Adell Manufacturing Co., Inc. of Orange, Massachusetts. (Patent #832541). This metal device was used to grip and lift the round metal lid covers on woodstoves. The tool was inserted into a hole in the metal cover, and the handles were pressed together in order to separate the tong ends to help them more easily and safely grip and lift the cover. Late 1800s.

Water pipe sherd

This is a broken piece of a large earthen pipe, slightly glazed, that was used to carry sewage or water. Note that there is enough curve in the sherd to see that it is part of a circular pipe, probably with a diameter of approximately six inches. This particular sherd is difficult to date. Pipes like this were commonly used from the late 19th century through the 20th century.



MODERN

Drill bit

This is placed in a slot at the end of an electric or battery-powered drill to make holes in wood, metal, and other materials.

Grapefruit spoon

The serrated edges of the spoon make it easier to remove sections from a halved grapefruit.

Nail set

Carpenters use nail sets to recess small "finish" nails into visible wood such as doorframes. The blunt end is hit with a hammer. The pointed end pushes the nail into the wood. The small hole that is made can then be covered with wood-colored putty to completely hide the nail.

Tuna drainer

This round white plastic device is placed on top of canned tuna after the metal lid of the can has been removed. The can is turned upside down, and the oil or water in the tuna is drained out when the device is pressed down with the thumbs.

Looking Carefully

Archaeologists learn from the artifacts they find. Imagine that you are an archaeologist examining this artifact for the very first time. Answer the following questions.

OBJECT NAME OR NUMBER:

DESCRIBE IT.

WHAT DO YOU ALREADY KNOW ABOUT IT?

WHAT DOES IS MAKE YOU FEEL OR THINK ABOUT?

WHAT ELSE WOULD YOU LIKE TO KNOW ABOUT IT?
