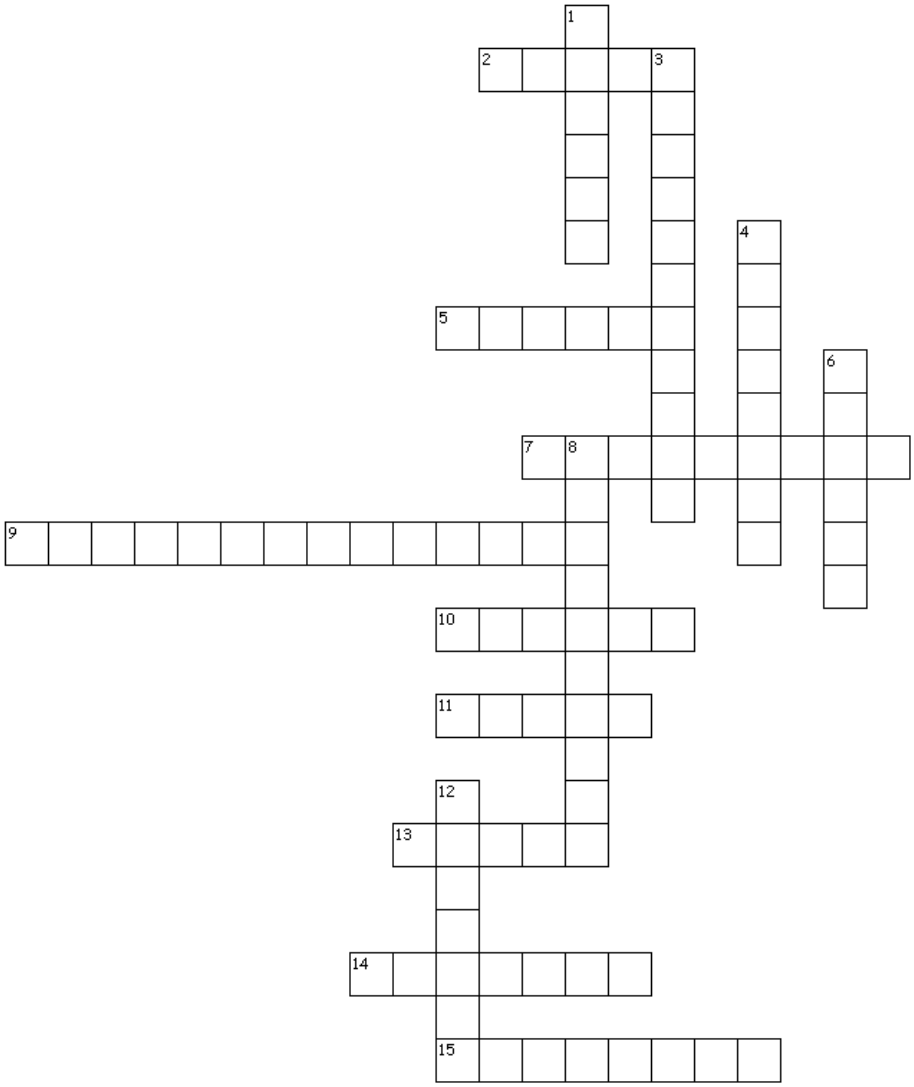
First Iron Works Fun!

There's so much here to see and explore. Once you have had a chance to look around, see if you can complete the puzzle! Have fun!

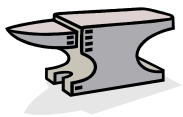
Across

2. In the Rolling and Slitting Mill these long flat bars were made.
5. This is someone you will meet today who will tell you all about the site and its history.
7. Iron items were stored in this building.
9. Here men would make things like nails and tools.
10. Here you can see many original artifacts and a 12-minute video that explains the history of the site.
11. These people were brought here as indentured servants from Scotland to serve mainly as woodcutters.
13. In this building pig iron was worked into wrought iron.
14. Here iron ore, flux, and charcoal were melted together.
15. These were made in the Rolling and Slitting Mill by placing flat bars through the slitters.



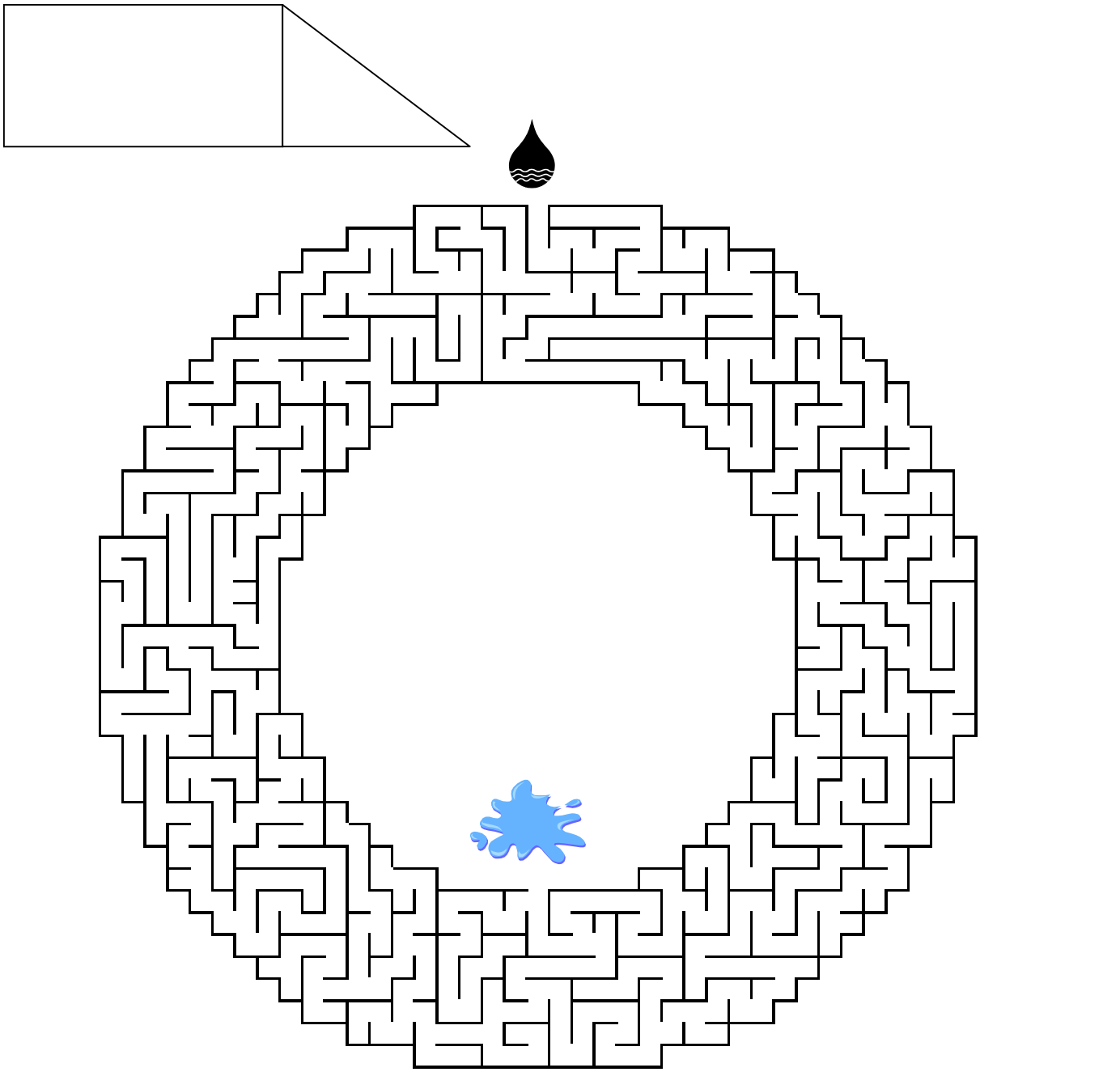
Down

1. This material was used as a flux in the furnace.
3. This is the name of the river that supplied water to run the waterwheels.
4. Made from trees, this was the fuel for the fires.
6. This was a man who was very skilled in his trade.
8. Young men, between 10 and 12 years, would work as one of these to learn a trade.
12. Found at the bottom of lakes and streams this was the name of the iron used here.



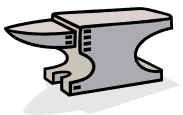
Water Wheel Maze

Waterwheels supplied the power to run almost all the machinery here at the iron works. There were three different kinds of waterwheels here, each designed to operate different types of machinery. Follow “Drip The Drop” through this waterwheel.



This wheel spun in a clockwise direction. It is the most common wheel on site. What type of waterwheel is this?

Overshot Pitch-back Undershot

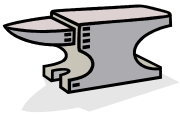


Life at Hammersmith

D E H S G N I T S A C L H W X M C H R S
I P J B U C Z P V F A F A A J R A N L E
N H R J L M U O I O I T M P U A S I V S
D R D E J A R S C G E R M P B B T S U U
E X E Z V B C R T R B W E R G T I H E O
N N D T B I A K W O O A R E I N R D U H
T L A A T H R H S R M F R N O A O P V E
U L G T C U E S K M G E G T Y H N O Y R
R I U U I E C B U D I M R I R C H T A A
E N Q N L R O D K G I T N C O R G O Q W
D S X G U A U T O L U O H E J E G R O F
S T E Y T F P P L O R A D S N M T J G K
E N W E I L W J G I W E S N H A I E W Y
R F Y N R K R E T S A M N O R I V R N D
V B E V B T G H R E I L L O C J C O Q C
A R N B T A G Z O J Z D S H J U O G R X
N F O I L U W H E E L B A R R E L O M I
T Q M S O M A S T E R N A I L L I B L V
O C X R I N V E S T O R D U F F L L T T
T Q W V N R R R M K A L V S G M Z Q N X

Listed below are some words associated with the colonial Iron Works at Saugus, 1646-1668. How many can you find? Do you know what they all mean?

APPRENTICE
BLACKSMITH
BOGORE
CASTINGSHED
CASTIRON
CHARCOAL
COLLIER
CUSTOMER
FINER
FIRE
FORGE
GABBRO
HAMMER
INDENTUREDSERVANT
INVESTOR
IRONMASTER
MASTER
MERCHANTBAR
MONEY
NAIL
PIGBAR
POT
PURITAN
SAUGUSRIVER
SLAG
SLITTINGMILL
TREES
WAREHOUSE
WATERWHEEL
WOODCUTTER
WORKBOAT
WROUGHTIRON



How to Make a Clay Axe

National Park Service
U.S. Department of the Interior

Saugus Iron Works National Historic Site
Saugus, Massachusetts

Step 1 Make a rectangular piece of clay to work with.
Step 2 Using your finger as a hammer, draw out the edges of the rectangle to create the face of the axe.
Step 3 Draw out the center of the axe. This is where you will put the handle.
Step 4 Bend the axe down the center and weld the edges together, leaving space for the handle.
Step 5 Next a blacksmith would weld a steel edge onto the hammer. Use different color clay to represent the steel edge.
Step 6 The axe head is finished. Now you can add a handle to make a complete axe.

How to Make a Clay Saw

National Park Service
U.S. Department of the Interior

Saugus Iron Works National Historic Site
Saugus, Massachusetts

Step 1

Roll out a long flat piece of clay. You may use the rolling machine to do this.

Step 2

Cut points along the edge of the saw. A blacksmith would call this shearing.

Step 3

Bend the points in alternating directions to make the edge of the saw wider. A blacksmith would finish the saw by punch holes on the edge to attached handles with.

How to Make a Clay Nail

National Park Service
U.S. Department of the Interior

Saugus Iron Works National Historic Site
Saugus, Massachusetts

Step 1

Make a long skinny piece of clay to use as nailrod.

Step 2

Using your finger like a hammer, draw out the end into a long skinny point.

Step 3

Use your finger to hammer down the top of the nail until it is flat. A blacksmith would call this upsetting.

How Did the Colonists Use Iron?

Iron was very important to the early colonists. Iron nails were used to build homes, meetinghouses, and schools. Iron tools were needed to clear land and plant crops. Iron kettles and pots hung over every cooking fire, while iron spits, Dutch ovens, and pans sat next to them. Iron was the backbone of Colonial America.

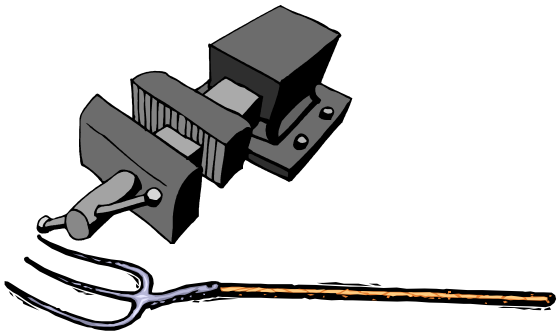
Examine each picture and circle all the iron parts. Be sure to notice the number of different things made from iron.

Colonial Tools

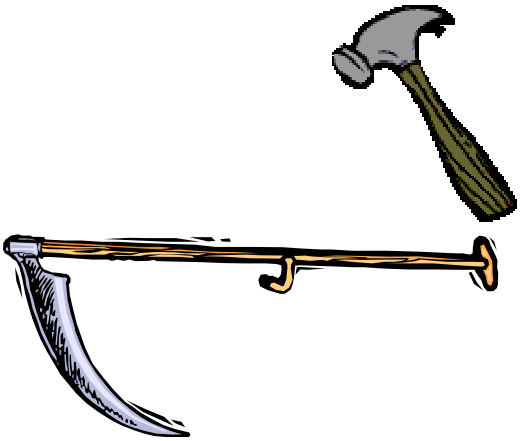
Colonists needed tools to build, farm, and fish, much like today. Though some colonial tools look a little different from those we use, they were just as important and performed many of the same tasks.

In the exercise below match the tool on the right with its name on the left.

Pitch Fork



Scythe



Vice

Hammer

Pliers

Hoe

Life in Colonial Times

Life in colonial America was very different from our lives today. Draw a line to match the description of present day life with that of a colonial child.

In which time period would you rather live? _____

Today

We shop at the mall for all the latest clothing styles and trends.

It is common to fly, drive, or take a train to go on vacation or visit family.

Comfortable, overstuffed couches and chairs are common in our homes.

Houses have many rooms and many floors. You may even have your own bedroom.

Letters can be delivered anywhere in the world in days. E-mails are delivered almost instantly.

Many children spend free time playing computer games, home game systems, handheld pocket games, or watching TV.

We enjoy many seasonal activities whenever we get the chance. They are a big part of our lifestyle.

"Staying-after" (detention) is a common result of bad behavior in school.

It is acceptable for anyone to wear their hair in the style they want.

In Colonial America

Children had little free time but enjoyed games like tag.

Activities, like swimming, were considered a "waste of time."

Almost every schoolmaster kept a birch branch, used to discipline bad students.

Girls covered their hair with a hood or kerchief. Boys had long hair.

Letters were written with quill and ink and sealed closed with wax. It took up to 4 months to deliver a letter, if it ever arrived at all.

The *settle* was a homemade wooden bench with high sides and back. It was not comfortable, but it was a place for the family to sit.

Most houses had one main room, the Hall. At night adults and babies slept there, children slept together in the attic.

No one traveled for fun, since roads were bumpy and could be muddy or dusty.

Most people made their own clothes. All the sewing was done by hand, and everyone helped.

Everybody Plays Games

Games have been part of our lives for thousands of years. They were designed to help children learn skills they would need later in life. Games taught children how to aim and throw, solve problems, work with their hands, follow directions, be fair, wait turns, and use their imaginations.

Below are two columns. In the first you will find the name of a game and the skill it taught. In the second you will find a picture of the game. Draw a line from the name of the game and the skill it taught in the first column to the picture of the activity in the second.

Name of the game and the skill it taught

Marbles:
taught how to play together.

Spinning a top:
a great exercise to teach dexterity.

Using a bow and arrow:
taught one how to aim.

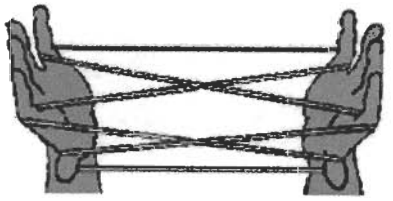
"Jack Straws" or "Pick-up-sticks":
taught patience.

"Tag":
learning to play together.

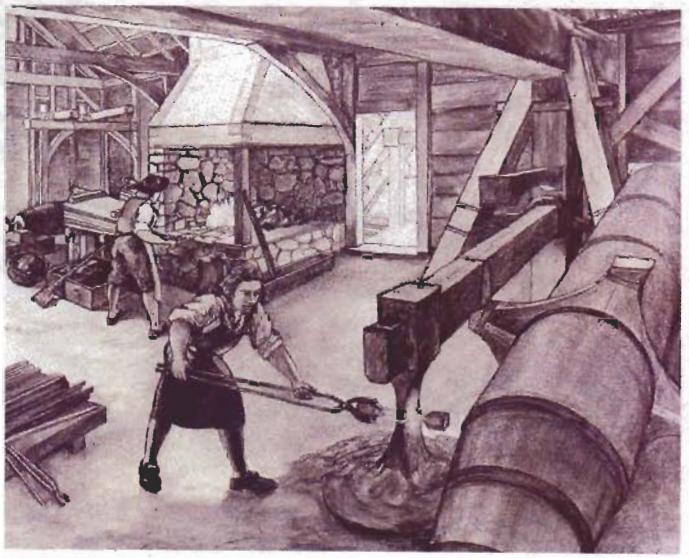
"Cup and Ball":
taught patience.

"Cats Cradle":
taught children to work together.

What it looked Like



People of the Iron Works



Saugus Iron Works brought together people from many backgrounds. Lots of people were needed to do the jobs needed for the Iron Works to operate.

In the Museum, you will find information about many of the different people, their religious beliefs, backgrounds, ages, and nationalities. Make sure to watch the film!

Next to each person, write a fact that you found about them.

Native Americans:

Scottish Prisoners of War:

Puritans:

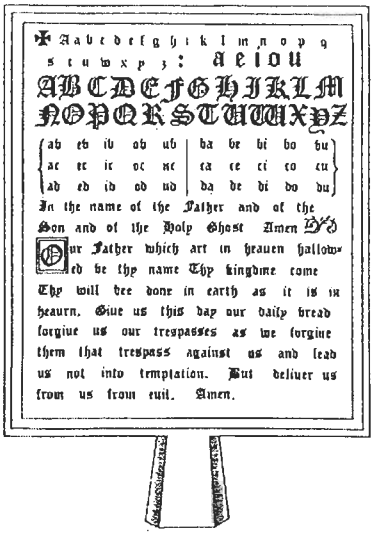
Iron Workers:

Women:

Company of Undertakers for the Iron Works in New England:

The Hornbook

Hornbooks were small wooden paddles with a sheet of paper glued to one side. Since paper was very expensive and scarce it needed to be protected. A very thin, see-through, piece of a cow's horn was placed over the paper to act as a laminate – that's how hornbooks got there name.



Hornbooks helped colonial children learn to read. First, they learned the ABC's. Next, they learned how letters sounded when they were paired together. Slowly, they learned to read real words. Colonial teachers thought it easier for students to learn to read something they said often, so the Lord's Prayer was printed at the bottom of the paper.

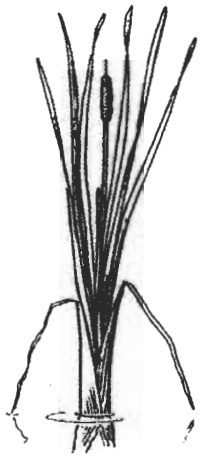
To the right is what a typical hornbook might have looked like in colonial times. Below is a hornbook for you to use. However, the text at the bottom is missing. Your assignment is to add the text – a song, poem, or book, you memorized before you learned to read.

a b c d e f g h i j k l m n o
p q r s t u v w x y z: aeiou

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

ab	eb	ib	ob	ub	ba	be	bi	bo	bu
ac	ec	ic	oc	uc	ca	ce	ci	co	cu
ad	ed	id	od	ud	da	de	di	do	du

More Than Meets the Eye



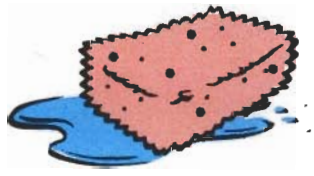
"Hi! I'm a cattail on the Saugus Iron Works wetland. I live here in a community with hundreds of plants and animals. We all help make this wetland an incredible area. We each have a job and work together. Let me tell you all the really neat things wetlands do! I think you will be very surprised, and maybe you will never look at a wetland the same way again!"

"Below draw a line to match the description of the job a wetland does to an object that is familiar to you. Have fun!"

We live on the Saugus River, a river fed by many smaller rivers, or tributaries. Heavy rains make the river swell. We **soak up** and hold much of the extra water and release it, slowly, back into the river to prevent flooding.

Many homes, companies, and factories line the river. Sometimes pollutants that could harm plants and animals get into the water. Our soils **filter** and decompose many of the pollutants, naturally cleaning the river.

If you sit and listen quietly, you will hear the sounds of birds, ducks, and geese, possibly see butterflies, and dragonflies. You might even feel the pinch of a mosquito. Hundreds of insects, animals, and plants **live here**.



Our soils are very special. They are so full of water that there is no room for air. Without air, objects that were buried a long time ago, like the Iron Work's furnace waterwheel, can't decompose. For almost 300 years, our soils kept artifacts **safe** so they could be discovered and learned from.

Wildlife Detective

Saugus Iron Works has a wide variety of wildlife on the site (including one of the most diverse populations of mosquitoes of any National Park in the country). Small mammals escape the bustle of the city. Migratory birds commonly use the Iron Works as a stop-over on their migration. And fish remain a presence in the Saugus River.

Here you will have the opportunity to be a Wildlife Detective and see what you can find as you look all around the site. If you see any of the animals pictured below, circle it! Then draw a line to the name of the animal.

Mallard Duck

Barn Swallow

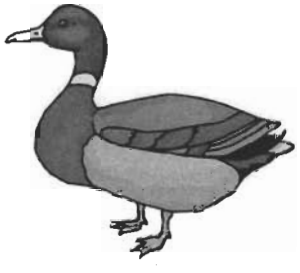
Red-Tailed Hawk

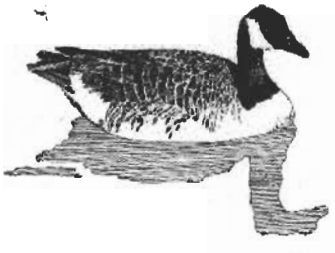
Canada Goose

Carpenter Bee

Raccoon

Gray Squirrel





A Snapshot

Create a snapshot of something in the park that you'd like to remember. Think about some of the things you have seen on your visit. Did you see the water wheels turn? Did you hear the hammer pound? Did you smell a charcoal-fueled fire? Did you touch a handmade nail?

At the bottom of the page, using the images you have drawn, create your story about the Saugus Iron Works that you would like to remember.

_____

_____

_____

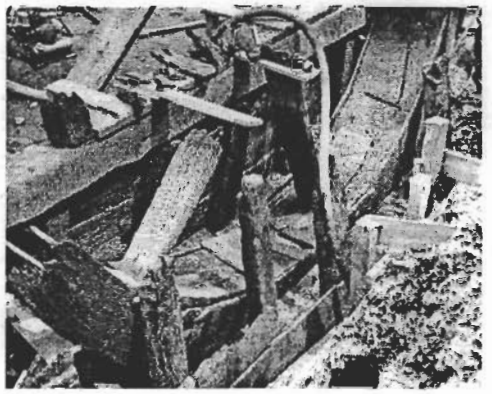
_____

_____

_____

_____

Museum Find



In the museum, you will find many original artifacts from the first Saugus Iron Works, 1646- 1668. Watch the film and explore the museum; see if you can answer these questions and find the Hidden Word from the shaded boxes. The Hidden Word is one of the missions of the National Park Service, important for all Rangers to know.

Clues	Answers
Some of the products cast from the Blast Furnace included pans, firebacks, and...	_ _ _ _
There are two products that come from the Slitting Mill; Flats and...	_ _ _ _ _ _ _ _ _
The main sales item here was a long, rectangular piece of wrought iron called a...	_ _ _ _ _ _ _ _ _ _ _ _ _
This river provided transportation of goods and power to run the machinery.	_ _ _ _ _ _
A stone- age culture, these people made their tools from stone, bone, and wood.	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _
This machinery part weighed over 500 pounds and was replaced 6 times each year.	_ _ _ _ _ _
Indentured _____ were people legally bound to work for a set period of years before they could gain freedom.	_ _ _ _ _ _ _ _
This material comes from the slow burning of trees and fueled many of the fires at the Iron Works.	_ _ _ _ _ _ _ _
Roughly 40% of this water wheel was found during the site excavation of the early 1950's.	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _
This is the 7th most abundant element in the earth's crust.	_ _ _ _
The iron ore used here was collected at the bottom of local lakes and...	_ _ _ _
Prisoners of war from this country were sent by the British to work here.	_ _ _ _ _ _ _ _

Did you find the Hidden Word? Enter it here: _ _ _ _ _ _ _ _ _ _ _ _ _.

How can you help Saugus Iron Works fulfill this Mission? _____

_____

_____

Saugus Iron Works Scavenger Hunt

Go on a scavenger hunt throughout the park. Look for the things listed in the boxes below. Draw their picture when you find them.

Try to find four in a row, across or down, or diagonally. For extra points try to find them all! But don't forget to leave everything just as you found it!

A piece of slag	Signs of a squirrel	A river	The slag pile
A water wheel	A piece of charcoal	A piece of wrought iron	A cam and striker
A wrought iron nail	A set of bellows	A sluiceway	A 500-pound hammer
A bird	A 17th-century artifact	A piece of cast iron	A blacksmith's anvil