

Growing Up in the Old Point Loma Lighthouse

Teacher Packet

Program: A second grade program about living in the Old Point Loma Lighthouse during the late 1800s, with emphasis on the lives and activities of children.

Capacity: Thirty-five students. One adult per five students.

Time: One hour.

Park Theme to be Interpreted: The Old Point Loma Lighthouse at Cabrillo National Monument has a unique history related to San Diego History.

Objectives: At the completion of this program, students will be able to:

1. List two responsibilities children often perform as a family member today.
2. List two items often found in the homes of yesterday that are not used today.
3. State how the lack of water made the lives of the lighthouse family different from our lives today.
4. Identify two ways lighthouses help ships.

History/Social Science Content Standards for California Grades K-12

Grade 2: 2.1 Students differentiate between things that happened long ago and things that happened yesterday.

1. Trace the history of a family through the use of primary and secondary sources, including artifacts, photographs, interviews, and documents.
2. Compare and contrast their daily lives with those of their parents, grandparents, and / or guardians.

Meeting Locations and Times:

9:45 a.m. - Meet the ranger at the planter in front of the administration building.

11:00 a.m. - Meet the ranger at the garden area by the lighthouse.

Introduction:

The Old Point Loma Lighthouse was one of the eight original lighthouses commissioned by Congress for service on the West Coast of the United States. Completed in 1855, it served as a beacon marking the San Diego harbor for 36 years. In 1891 the official light was moved from its lofty hilltop position to its present location near the shore at the tip of Point Loma. Low clouds were not so likely to obscure the beacon at the second site. Today, the original Old Point Loma Lighthouse has been restored and furnished to represent a home in the 1880 time period. It remains a symbol of the life of the early lighthouse keepers.

The initial European visitors did not have the security of a dedicated beacon marking the entrance to the harbor. Cabrillo, Vizcaino, and Portola with the Serra party were the first Europeans to use the bay. The settlements that followed brought increased traffic. The

discovery of gold and the whaling activities located in the harbor provided the justification for a light to be established at the entrance to San Diego Bay.

The construction plans selected for the original lighthouse placed the tower inside a two-story dwelling. The reason for the inside tower was to protect the light keeper from the dashing waves and storms, and to avoid the necessity of going to another location to tend the light. The tower contained a Fresnel lens, which was made in France. It magnified and refracted light using glass prisms to project a strong beam that could be seen for 25 miles. The lens was lit with three concentric wicks placed inside the device. Sperm whale oil was used when the light was first lit. By the time the light was decommissioned, the fuel had changed to kerosene.

The light keeper was kept busy polishing the lens, trimming the wicks and making certain that fuel and supplies were always available. Robert Israel served as lighthouse keeper longer than any other appointee. Mrs. Israel served as the assistant keeper for part of the time. The Israel family lived in the Old Point Loma Lighthouse for about 18 years. The furnishings and embellishments in the house today represent the period of his occupancy during the 1880s.

After the old lighthouse went out of service, it was abandoned and left to deteriorate. In 1913, the hilltop location was chosen for the site of a National Monument to commemorate the 1542 voyage of Juan Rodríguez Cabrillo. Today the lighthouse serves as a reminder of the life of a 19th century light keeper and the dedicated service he performed on the West Coast of the United States.

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Activity Packet

The Old Point Loma Lighthouse is a very special place for children to visit. During the ranger-led program, the children are introduced to a variety of life activities common during the 1880's that make life different from today. One area that is not discussed is how children used their free time. Children were responsible for chores just as they are today. The chores may have been different than those required today, but they were chores nonetheless.

Games and toys would help fill unstructured time for these children. Store-bought toys available in the 1880s were very few and far between. Most toys were homemade. Games were an important part of their lives. Board games, storytelling, songs, dances as well as cards would have been a good pastime during the evenings.

Following are a variety of "outdoor" games that can be played on the playground or in the classroom to be used in preparation for, or as a follow-up to, your visit to Cabrillo National Monument and our Educational Program. Also included in this packet are discussion questions and a long-term activity project to use after your visit to Cabrillo National Monument.

Games

Hopscotch - The version of Hopscotch that is played today is basically the same as that used in 1880. Use a stick to draw hopscotch squares in the dirt. Use a rock to throw as a marker.

Squat Tag - This is a simple tag game using the squatting position as a "safe" position. Any player that is not squatting can be tagged.

Stone Poison - This is another tag game in which the individual must be standing on a "rock". This rock can be real, or it can be a piece of paper spread over the area to represent a rock. The usual rules are that children can be tagged if they are off the rock.

“Follow the Leader” Jump Rope - Two students swing a long, heavy rope in a smooth motion. Form two teams and choose a leader from the rest of the group. Each team must do what the leader does. If someone does not follow the leader, they are "out". See which team can follow the leader better. There are many other ways to use this game.

Wheelbarrow Race - One or two children pick up the legs of another child who walks with his/her hands and arms to the finish line. If the legs are dropped, the team has to begin again. The first team over the line wins. Make the course 15 to 20 feet long depending on the age of the children.

Three-Legged Race - Each team of two children ties their inside legs together (giving the team only three legs) and races to the finish line. Use cloth to tie the legs. Any number of teams may race.

Drop the Handkerchief – (similar to Duck, Duck, Goose) Children sit in a circle. The “it” child runs around the circle and carefully drops the handkerchief behind another child. This child chases “it” around the circle. If “it” gets around the entire circle and takes the child’s place, then the second child is “it”.

Leap Frog – Children get in a line. One child jumps over the child in front of him. He squats low and the child behind him jumps over him. They keep taking turns.

Statue – A tag game like Freeze Tag except kids freeze in an unusual shape, like a statue. A statue can be "unfrozen" when touched by a teammate who is not "it".

Cat's Cradle and Cat's Whiskers - This is a string game of long ago that can be played for hours, by yourself or with friends. All you need is a heavy string or yarn about 4 to 6 feet long. The drawing will help you figure out how to make the cradle and the whiskers. There are three main moves in the game. They are:

- Transferring loops from one finger to the other
- Dropping loops from fingers
- Picking up strings with fingers

After each move, the hands are pulled apart, palms facing each other so that the strings are held taut (tight).

Cat’s Cradle Directions:

1. Put the string loop behind your thumb, across your palm, and behind your little finger. Do the same with your other hand.
2. Take the pointer finger of either hand and put it under the string that runs across the palm of the opposite hand. Spread your hands pulling the string back.
3. Repeat the procedure with the pointer finger of your other hand.
4. After pulling both hands apart, the palms facing you will have the cats cradle, and the basic position from which to make other string figures.

Cat’s Whiskers: Continue from the cat’s cradle position to make cat’s whiskers.

1. Curl in both thumbs so that the string slips off them.
2. Reach down with your thumbs and pick up the bottom string by placing your thumbs under it and pulling up.
 3. Put your thumb over the top string and pick up the next two strings.
 4. Curl in your fingers so that the string slips off them.
 5. Put your little fingers over the string next to them and pick it up.
6. Finally, drop the string from your thumbs and you have cat’s whiskers.

If at any time your string figures end in a triangle, just start again. Once you have reached this point in making string figures, you might find a library book on this subject, or experiment with different moves and figures yourself.

Discussion Questions

Pretend an Antique or Artifact Could Talk – At the Lighthouse you saw an old coffee grinder. Talk about:

- What it might say about the person who used it
- How it was used,
- How it was cared for and valued
- How it survived to be here, etc.

‘The Good Old Days’ – Discussion following field trip: What would you like about living in 1880? Not like? What will life be like when you are 80 years old? Use your imagination! Think how much things have changed since your families were your age and discuss the changes. Talk with your family about this. Think what schools and jobs will be like when you are 80. What about music, sports, toys, recreation, prices, food and clothing? WOW!

"Imagine Life.." - Ask the students to list items found in their homes that require electricity (refrigerators, televisions, video games, lights, etc.). List the items on the board. Now ask the students what life would be like without each of these things. Have the students make suggestions about substitutes for each item. (How would we preserve food today? What would you do for entertainment? How would you see in the dark?)

There was no running water on Point Loma or anywhere nearby. This activity can be used to explain how life would be different because of the lack of running water. List all of the things we do today with running water, such as brushing our teeth, showering, cooking and washing our clothes. Then list alternatives so that each of these activities could be part of the lives of the people of 1880.

What If? - Using small groups, have students address the questions of “what if we did not have running water?” and "what if we did not have electricity?" First have students identify important activities using water and electricity, and devise methods to make these activities possible, or use other activities to take their place. Then share the solutions of each group with the rest of the class.

Long-term Project

Garden of Yesteryear: This is be a long-term activity that requires space and attention.

Steps for garden activity would be:

Soil preparation

Seed or seedlings are placed in the soil

Water

Watch for insects and spiders

Harvest

Plant choices for such a garden would include most common vegetables in seed form. Most all root vegetables are good choices. However, carrots are slow to germinate, and do not transplant well. Radishes are good in that they grow quickly and are easy. Beets are a good choice. The seeds are large enough for a child to handle easily. For such plants as broccoli and cabbage, small plants are the best choice. Squash is a good choice since it grows fast and the fruit ripens quickly. Corn is always a nice addition to a garden, but remember that this is a summer crop and needs a lot of space.

This is a good time to discuss weather, and how the family living at the lighthouse could water their garden. Solve problems of how to control rabbits and squirrels that would eat the young plants.

Discuss the advantages of fresh food. Let the children see how easy it is to pick these vegetables. Hopefully they will find this activity fun and it will provide the students with a chance to do some problem solving activities.

Lighthouse History
Information from: The United States Lighthouse Society
244 Kearny Street
San Francisco, CA 94108
(415) 362-7255

Many years ago, people decided to explore the waters by boat. During the day they could find their way back to the landing place by looking for a pile of rocks that had been left there. These were the first daymarks. But how could they find their way home at night? Since much of the shoreline looked very similar, friends had to light a bonfire on a high point to guide them to the right landing area. Still later they used a pole or a tripod to hang a metal basket containing a fire as a method signaling.

Our first lighthouses were actually given to us by nature herself. Sailors sometimes used landmarks such as glowing volcanoes to guide them. In the ancient world, trading ships were eventually built enabling navigators to sail long distances to buy and sell goods. In the days of wooden ships with sails, the wind and waves could easily push them against the rocks and wreck them. And so, the need for lighthouses as warning signals arose.

One of the Seven Wonders of the ancient world was a lighthouse – the famous Pharos of Alexandria, Egypt. It is the first one that is recorded in history and was built about 280 BC. These records tell us that it was the tallest one ever built: 450 feet (comparable to a 45 story skyscraper) and used an open fire at the top as a source of light. Can you imagine being the keeper, climbing to the top to light the fire, and then forgetting the matches, or whatever was used in those days to start a fire.

This fantastic structure survived for 1500 years until it was completely destroyed by an earthquake in the 14th Century. Slave labor was used to build it, and it took twenty long years to complete. It was a three-part tower with a square base, a second story with eight sides and a narrow and taller round third story. At night they believed its lighted fire could be seen for thirty miles, whereas by day it produced a column of smoke for a daymark. Today we call people who study (or are interested in) lighthouses pharologists. The name comes from that famous lighthouse.

What is a lighthouse? It is a tower with a bright light at the top, located at an important or dangerous place regarding navigation (travel over water). The two main purposes of the lighthouse are to serve as a navigational aid and to warn boats of dangerous areas. It is like a traffic sign on the sea.

Do all lighthouses look alike? Although we often think of a lighthouse as a tall, white conical tower, there are many, many variations of design. Depending on its location, it might be tall (where the land was very flat) or short and squat (where there was a high cliff or rocky coast). It could be square, octagonal (with eight sides), conical

(like an upside down ice cream cone), cylindrical (like a very fat pipe), or even like a skeleton. You might find the lighthouse standing alone, attached to the building where the lighthouse keeper lives, or connected to the keeper's quarters by an enclosed walkway. Sometimes the lantern room is built into the roof of the keeper's house.

When the lighthouses were built, they were constructed with whatever materials were most readily available. They were designed to fit the local geographic and climatic conditions. Some are made of stone, others brick, concrete, wood, steel, cast iron, or even tabby (a mixture of shell, lime, sand and water). So you can see that each lighthouse is very unique.

Where are lighthouses located? They can be found in a variety of places, on rocky cliffs or sandy shoals on land, on a wave-swept reef in the sand, and at entrances to harbors and bays. They serve to warn the sailor of dangerous reefs beneath the sea or perilous rocky coasts on land, and to guide ships into safe harbor or back out to sea. So the message of lighthouse might be: STAY AWAY, DANGER, BEWARE or COME THIS WAY. Every lighthouse tells the mariner, "This is exactly where you are."

Our country has several coastlines used by ships from around the world. In the East it borders the Atlantic Ocean, in the West, the Pacific Ocean, and in the South, the Gulf of Mexico. But we also have another very important area of coastline where the land meets the sea, the Great Lakes. All of these four areas bordering our country need and have lighthouses, as well as some of our more important navigable inland waterways.

How could one lighthouse be distinguished from another? Years ago, before they had all the sophisticated technology of today – loran, radar, sonar, on-ship electronics, radio beacons, etc. – ships near shore in the daytime would use lighthouses as a landmark. This use gave them an additional name – a Daymark.

Imagine that you are the captain of a ship sailing along the coast. You need some landmarks to help you find your position. When you look on shore, you see a tall red brick tower. Then you sail about forty miles down the coast and you see another red brick tower – just like the first one. How would you know where you are? This is the way things were along a portion of the Virginia and North Carolina coast in the 1790s. To help the mariner determine his location, the Lighthouse Board (which was in charge of lighthouses from 1852-1910) issued an order to have each lighthouse painted in different colors and/or designs. This is the best example of DAYMARKS we can see today.

But what about nighttime – the most dangerous time to navigate, and the main reason lighthouses exist? You cannot see colors or patterns at night, but you can see lights. However, unless there was some way to make each light different, you could have the same problem. Early on, in a few places in our country, multiple lights (that is, two or three together) were built. Building double or triple lighthouses was one way to help the sailors at sea determine their location, but it was a very expensive way to do it. Mounting a group of lights on a rotating framework made it possible to produce a special

signal (the first flashing characteristic) for each lighthouse, so they could be easily told apart.

The invention of the Fresnel lens in 1822 was probably the most important discovery in lighting technology. As well as enabling man to produce an unlimited number of flashing combinations, it also intensified (brightened) the light so it was much more helpful to the mariner, and could be seen at greater distances.

The Fresnel (pronounced “Frey Nel”) lens can be compared to a huge lamp shade except that it is made of hundreds of pieces of beautiful, specially cut glass. It surrounds the lamp bulb, but is different from a lampshade, which concentrates the light downward. This lens, due to its special design and because it is made of glass, intensifies the glow from the light. It takes the rays of light which normally scatter in all directions and bends (refracts and reflects) them, focusing them into a single beam of light which shines out in a specific direction.

Fresnel lens are of two types: **Fixed** - which shows a steady light all around the horizon, and **Revolving** – which produces a flash or a characteristic. The number of flashes per minute depends on the number of flash panels and the speed at which the optic (lens) revolves.

Different periods of darkness and light produce a unique flash pattern for each light. For example, a light can send out a flash every five seconds, or it might have a fifteen-second period of darkness and a three-second period of brightness, or any number of other combinations. The individual flashing pattern of each light is called its **CHARACTERISTIC**. Mariners have to look at a light list or a maritime chart to tell what light flashes that particular pattern and what color the light is as well. Then they are able to determine their position at sea in relation to the land.

Fresnel lenses come in several commonly used sizes (called orders). The larger ones (first order), used on major seacoasts, flash a more powerful beam which shines as far as twenty-one miles out to sea. Sixth order lights, the smaller ones, are used in bays where they do not have to shine as far or as brightly.

Most look like a beehive or barrel: some have bulls eyes and can contain from two to twenty-four different panels. Those with the fewest flash panels (two) are called clamshell or bivalve lenses. A clockwork type mechanism (which had to be wound by hand every few hours before the advent of electricity) is used to make these revolving lenses rotate around the lamp itself to produce the flash. The movement of the lens is timed precisely so the bulls eye panel will pass by when a flash is due.

The lenses are really beautiful works of art; most contain hundreds of prisms – pieces of specially ground, cut and polished glass which, when arranged in a certain way, bend (reflect and refract) the light. Thus all the rays of the light are collected and redirected into a single pencil beam of light. This makes it much brighter and more effective. The lenses themselves can weigh as much as four tons.

Another way to distinguish lights is through the use of color. Although most lights have a white lamp, some do use red and others green lights, as well as combinations of the colors.

What happens in fog when the light is not visible? Have you ever been out in a car on a dark, stormy, very foggy night? You know how difficult it is to see other cars on the road. Now, picture yourself sailing along a black-looking sea in a thick pea soup fog with no stars shining or moonlight visible. The windshield wipers are working overtime, but the view of the light from the lighthouse is being blocked by fog. In situations like this, there is another method of notifying the mariner by using sound. This is called a foghorn. The first one was used in 1790 at Boston light and it was of all things a cannon. Can you imagine being a lighthouse keeper and having to fire the cannon every hour when there was fog? During a long spell of fog you would not get any sleep. Later they tried various other means of making a noise for warning. Fog bells were used as well as steam whistles and reed trumpets and sirens. The sound they gave out were generally low pitched and every mournful – almost like a wail. Each one emitted a specific number of blasts every minute so it could be told apart from all others. Today, an automatic sensor that detects moisture in the air turns on the fog signals when needed. There are also soundless signals called radio beacons (an electronic device).

These fog signals were not placed everywhere. Although some places experience no fog problems, fog-warning devices are very necessary in New England, on the Pacific Coast, and in Alaska.

What fuels were used to produce light? The main source of power for the light today is electricity although in some places they use acetylene gas. For thousands of years before the electric lamp bulb was invented by Thomas Edison in 1879, different fuels were used to illuminate the lamps. First, it was wood and coal for fires, then bales of oakum and pitch, and rows of candles. Later lamps were lit using various fuels – sperm whale oil (produced by cooking the blubber of the whale), lard oil (from animal fat), kerosene (a fuel like gasoline with a petroleum base), etc.

When they first designed a lighthouse with an enclosed lantern room it was possible to use candles for light. One lighthouse used 60 candles! Most used far fewer candles that were sometimes arranged in a circular candelabra or a chandelier with two tiers or on a frame.

Next came spider lamps which consisted of a shallow brass pan containing oil with either four, eight or more wicks usually arranged in a circle; but other shapes such as a rectangle were also used (since a spider has eight legs, the first one probably had eight wicks!).

Two very important discoveries occurred in the late 1700's. The parabolic reflector was a bowl-like device with a small oil lamp in the center. The light from the

lamp was gathered and focused into a beam. This was similar to putting a mirror behind a flame. Thus the first really efficient lighthouse was created. Think of a flashlight that has a silver reflector behind the tiny bulb to increase the brightness of the light. It is based on the same principle.

The invention of the hollow wick oil lamp (the Argand lamp) resulted in a light that was seven times brighter than a candle. This lamp was used with various types of fuel inside the Fresnel lens until the electric light bulb was invented.

The first lighthouse ever to use electricity in this country was the Statue of Liberty in 1886. Yes, this special symbol of freedom was used as a lighthouse in the New York harbor for the first fifteen years existence.

Where were the first lighthouses built in our country? In colonial times, before we became an independent nation, men realized the need for lighthouses at the major ports to help guide ships into the harbors, to prevent them from crashing and thereby losing their precious cargoes. So the first lighthouses were built by the colonies (which were called states when we became the United States of America). In those days the ship owners had to pay a fee (toll) for the use of the lights which helped cover the costs of their construction and maintenance. Each ship that passed by a lighthouse on its way into or out of a port paid a tax based on the weight of the cargo it was carrying. They paid a penny for each ton of goods on board the ship. You have to remember that in those days, a penny was worth a lot more than it is today. Once we gained our independence from Great Britain and the federal government took charge in 1789, this fee was eliminated.

What is the difference between a lighthouse and a light station? A lighthouse is the tower itself containing the lantern room with the lamp that shines its light. A light station (which is usually onshore, but occasionally on offshore islands) is the property containing all of the outbuildings (as many as eight) of the “station”, as well as the lighthouse tower itself. There were usually separate living quarters, depending on the number of lighthouse keepers and assistants living there. Besides these, there would probably be an oil (or fuel) house, a barn, a boat house, and a fog signaling building.

What duties did lighthouse keepers perform? Before the days of electricity, they had to light the lamp at sunset and extinguish it at sunrise. During an 8-hour watch at night they had to climb the stairs in the tower one to three times a night to check on the light and wind the weights that operated the clock. Some lighthouses have as many as two hundred steps! Keepers earned the name “wickie” because one of their chores was to trim the burning lamp wick so it would not smoke or dirty the lens. The brass in the building had to be shined, and all the windows cleaned. Often it took a whole day to clean and polish the lens alone. It was very important both the lens and the lantern room windows be cleaned so the light would not be diminished (lessened) in any way. A daily log had to be kept detailing everything from the weather to the amount of fuel consumed. Keepers also had to tend to the mechanism used to operate the fog signal. During the year many items had to be painted. Keepers and their families were kept very busy.

What is the most important aspect of the lighthouse? Of course it is the light that shines out from the lantern room at the top which encloses and protects the lens. This lantern room is made of metal and glass that is divided into sections by pieces called astragals. Usually the astragals are vertical (up and down), but some are diagonal.

What is happening to lighthouses at present? Today all of the lighthouses in our country have been automated, except the one at Boston, which still has keepers (for sentimental reasons only). Many of the lighthouses are now no longer needed because of advances in technology, and they are gradually being turned over to various government agencies or non-profit local organizations to maintain and administer. It is important to keep them in good condition for future generations to learn about their place in the history of our country. They also need protection from vandalism and threats of erosion. And it is a special experience to be able to climb the stairs just as the keepers did and picture what life was like in times past.

Why are people interested in lighthouses? The word “lighthouse” represents a variety of ideas and emotions ...beauty, romance, isolation, fear, danger, security, sacrifice, home, etc. Lighthouses are usually stunning buildings in spectacular surroundings. Lighthouse stories epitomize some of the classic themes used in storytelling throughout history. The technology is interesting, the buildings are beautiful and the stories of the lighthouse keepers are fascinating. The keepers were a group of regular people who selflessly staffed isolated stations to help ensure the safety of others. All of these aspects combine to explain the growing popularity of lighthouses. It is important to save their buildings and their stories for the future.

The Lighthouse “Rules”

By Debra Joanis, Susan Mackreth, Sally Mika

See the National Park, with everything intact.

Preserving and conserving depends on how you and keepers act.

The Lighthouse “Rules”, and so did the trip.

Follow all regulations and you’ll have a true grip.

Every keeper must be courteous, and keep a watchful eye,
At the lighthouse station where the beacon sweeps the sky.

We won’t scratch initials, or cut down any tree.

Or trample plants and bushes, we can or cannot see.

A keeper must keep, a lighthouse occupied.

Their job is very serious: they always must abide.

Relying on teamwork, keepers’ tasks they share.

The keeping of a watch book or climbing many stairs.

Don’t allow folks to bother animals and birds of song.

The keeper will enforce the fact, that animals and birds belong.

See the National Park, with everything intact.

Preserving and conserving, depends on how you and keepers act.

Hope we will remember the importance of the task.

Keep the park a treasure, we know it will last.

I will always remind myself, and others I will tell,

About the life of a keeper and of working together well.

Please a never forget, about the passage of time,

Of a keeper, whose life affected yours, theirs and mine.

See the National Park with everything intact.

Preserving and conserving, depends on how you and keepers act!