Lighthouses

Pre-Visit Study Unit

Cape Canaveral Lighthouse Educational Tour

What is a Lighthouse?

A lighthouse is a tower with a bright light at the top, located at an important or dangerous place for navigation (travel over water).
The two purposes of a lighthouse are to serve as a navigational aid and to warn boats of dangerous areas.

Rocky Ledges

Cliffs

Shoals

Reefs

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 sea, and at entrances to harbors and bays. They serve to warn the sailor of danger and to guide ships into a safe harbor or back out to sea. So the message of the lighthouse might be—STAY AWAY, DANGER!, BEWARE!, or COME THIS WAY
Every lighthouse tells the mariner, "This is exactly where you are."

Left: Fowey Rocks warns mariners of reefs
Right: Sanibel Island guides mariners to San Carlos Bay.

Lighthouses tell mariners their locations by their **day marks** and by their **characteristics**

A day mark is a unique color scheme and/or pattern that identifies a specific lighthouse during the day
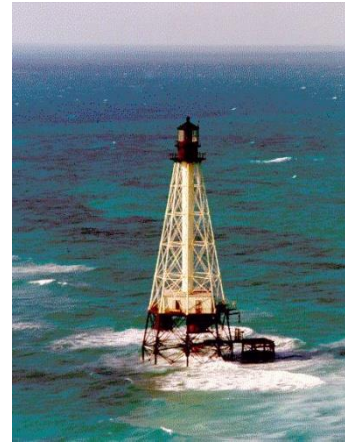No two lighthouses have the same day mark.

The Characteristic of a lighthouse is its individual flashing pattern at night.
No two lighthouse lanterns have the same flashing pattern.

Do all lighthouses look alike?

Although we often think of a lighthouse as a tall, white conical tower, there are many variations of design. Depending on its location, it might be tall (where the land is very flat) or short and squat (where there is 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 fat pipe) or even a skeleton of a lighthouse.

Hexagonal
(6 sided)
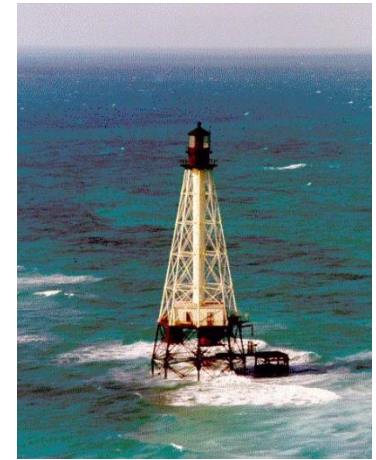Garden Key
Florida

Skeletal
Hillsboro
Inlet
Florida

Conical
Cape
Canaveral ,
Florida

Housetop
Gasparilla Island, Florida

Screw Pile
(legs /pilings are
screwed into
seabed)
Alligator Reef,
Florida

Octagonal
(8 sided)
Cape Henry,
Virginia

Cylindrical
Point Arena, California

Caisson
Baltimore Harbor Light,
Maryland
(the lighthouse sits on a
large concrete block sunk
into the seabed)

Caisson
lighthouses
are
nicknamed
"spark plug"
lighthouses.
Can you see
why?

Cape Canaveral Lighthouse
Cape Canaveral Air Force Station

Date of Construction: 1868
Construction: Cast iron plates with brick lining
Builders: West Point Foundry, Cold Spring, New York
Tower Height: 151 feet
Number of Steps: 176
First lighted: May 10, 1868
Current Lamp: DCB-224 rotating searchlight
(replaced First Order Fresnel Lens in 1993)
Characteristic: 2 flashes in 5 seconds followed by a 15 second eclipse (darkness)
Day mark: Conical tower with black and white horizontal bands
Active lighthouse: yes

The first lighthouse at Cape Canaveral was built in 1848. It was a 65 foot brick tower. It was replaced in 1868.

Amelia Island

St. Johns

St. Johns River

St. Augustine

Ponce de Leon Inlet

Pensacola

St. Joseph Point

Cape San Blas

St. Marks

Crooked River

Cape St. George

Cedar Keys
(Seahorse Key)

Cape Canaveral

Anclote Key

Egmont Key

Jupiter Inlet

Boca Grande Entrance
Rear Range

Port Boca Grande
(Gasparilla Island)

Hillsboro Inlet

Sanibel Island

Cape
Florida

FLORIDA

Fowey
Rocks

Carysfort
Reef

Alligator
Reef

Dry Tortugas

Key West

Garden Key

Sombrero Key

Sand Key

American Shoal

Facts about Florida Lighthouses

As many as 49 lighthouses were built in Florida, however, only 30 remain today.

Study the map of Florida to find the answers to the following:

1. Why do you think Florida has lighthouses?
2. Find the following lighthouses: Fowey Rocks, Craysfort Reef and Alligator Reef. Why do you think they were built at their locations?
3. Why do you think the American Shoal Lighthouse was built at its location?
4. Find Crooked River Lighthouse, Seahorse Key Light and Boca Grand Lighthouses. They were built to guide ships to ports where they were loaded with products such as cotton, citrus and rice.
5. Although their names are those of animals found in Florida, Alligator Reef and Seahorse Key lighthouses were not necessarily home to these animals. Seahorse Key is shaped like a seahorse and Alligator Reef is named for the U.S.S. Alligator which sank near the reef in 1863.
6. Some of the Lighthouses have names based on historical events near them. Cape Canaveral and Sombrero Key are named because of their association with the early Spanish explorers. Do you see them on the map?
   (answers)
   1.Florida has 1,800 miles of Coast with many marine hazards. Lighthouses were important to the development of trade, to the U.S. military and to settlers coming to Florida. 2. They were built to warn mariners of dangerous reefs. 3. It was built to warn mariners of a dangerous shoal. 4. Information only
    5. Information only 6. Information only

Let's think about Lighthouses

1.Lighthouses were built out in the ocean, on cliffs, reefs and sandy shores subject to erosion. Do you think it was easy or difficult to build lighthouses at these locations? The Minot lighthouse was built on a large rock out in in the ocean. What problems might the builders have encountered?

2.Lighthouses have been named such names as "Cape Disappointment," "Graves Ledge," "Shipwreck Point" and "Port des Morts" (Death's Door). Do their names explain why a lighthouse might have been built at these places?

3.The Statue of Liberty is known as the first lighthouse in America to be electrified. Why is she called a lighthouse?

4.If you are traveling down the coast without a map (or GPS) how might you know your location?

5.If you are out in a boat and caught in a storm, how would you feel if you suddenly saw the light from a lighthouse?

6.The first lighthouse in history was built about 280 B.C. in Alexandria, Egypt.
 The source of light was an open fire. Before the development of electricity, what else might have been used as a light and as fuel for the lights in lighthouses.

7. What do you think you can see from the top of a lighthouse?

New Neighbors Move In

Cape Canaveral Lighthouse

Educational Tour

Between September 1939 and September 2, 1945 the vast majority of the world's countries formed two opposing military alliances and fought in a global war known as World War II. This war led to the development of weapons of destruction such as the V-2 rocket developed by the Germans. The V-2 was designed to bomb London, Antwerp and other European cities. It traveled at four times the speed of sound and so was impossible to shoot down. This was the first ballistic missile. A ballistic missile is a rocket-powered missile launched in a high arc to deliver an explosive war head to a target.

A V2 Rocket ready to launch from Germany
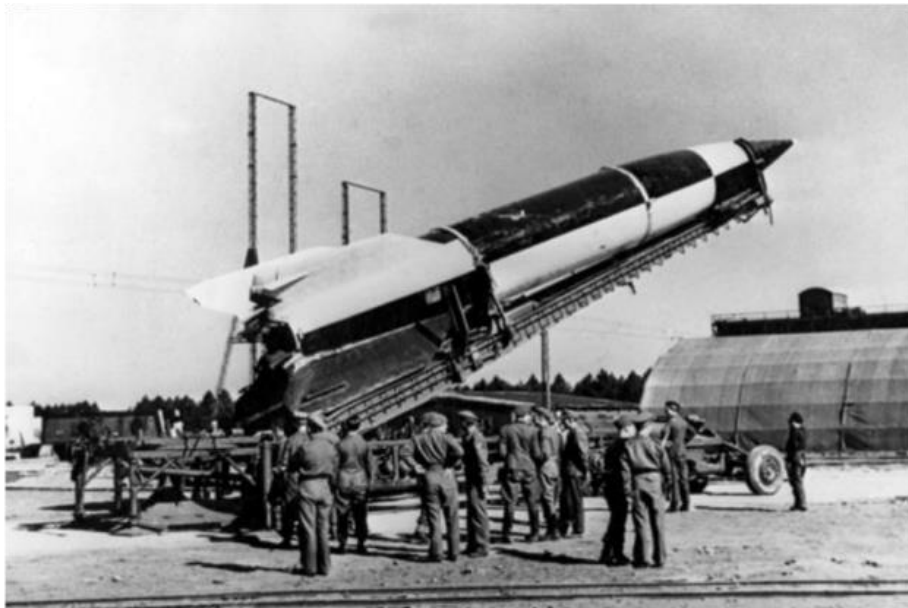
Damage to London, England caused by a V2 rocket

At the end of the war, 300 trainloads of V2 rockets were shipped to the United States along with the majority of the Germans who were the principal designers of the V2. Led by Wernher von Braun , this team of German rocket scientists helped assemble the first United States V2 rocket. It was launched from White Sands, New Mexico in April ,1946. More than 60 V2 rockets were launched from White Sands. However, in May of 1947, a rocket fired from White Sands went across the border into Mexico and landed near a cemetery in Juarez. The missile's crash shook virtually every building in El Paso and Juarez. A witness said that "Flames shot into the air like a mushroom." another said that it looked like a "miniature atomic bomb exploded."

The desert of White sands had grown too small for this rocket. A new launch site had to be found.


Wernher von Braun
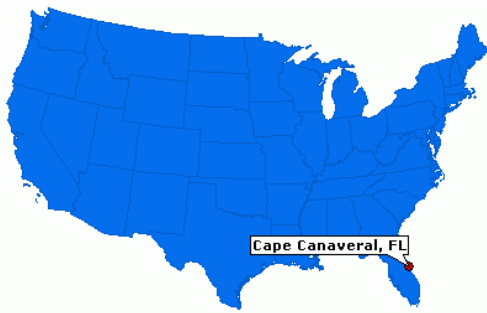
Where's the best place to launch a rocket?

The search for a new test range spread from California and Alaska to Florida. The choice to move it to Cape Canaveral was determined in part by the low population (only a little over 100 people lived at Cape Canaveral at this time), the distance from any centers of population (large cities) and the year-round good weather.

The government owned land at the Cape Canaveral Lighthouse and the facilities of the World War II Naval air station were available for use to test and develop the rocket program.
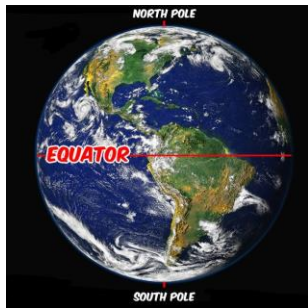
Cape Canaveral was located close to the equator which allowed launches to take advantage of the direction of the earth's rotation for an initial boost into space. Launching in an eastward direction also meant that in case of failure of the launch, the rocket would fall into the ocean instead of on land.

Brevard County's introduction to the Space Age came in October, 1949, when President Harry S. Truman established the Joint Long Range Proving Grounds at Cape Canaveral. The first launch from the new testing area occurred on July 24, 1950. The vehicle was called "Bumper" and consisted of a V2 engine with a second stage called WAC Corporal attached. After the fuel in the V2 engine burned away it would fall away and the engine in the WAC Corporal would ignite to carry the rocket higher. This is called "staging" which means that the vehicle has more than one engine to enable it to travel higher or further away from the launch pad.

During World War II, the governments of the United States and the Soviet Union (Russia) had become allies to defeat Germany, but there was a mutual distrust between them. This distrust led to both nations developing weapons of war using the new rocket technology. Two types of missiles were built:

Ballistic Missiles

 A ballistic missile is a missile launched by a rocket or rockets in stages, but then follows an unpowered path in a high arc to deliver an explosive war head to a predetermined target.

Cruise Missiles

A Cruise missile is a missile propelled by rocket engines much like an airplane. A cruise missile is self-guided but operators can manually guide it to its target.

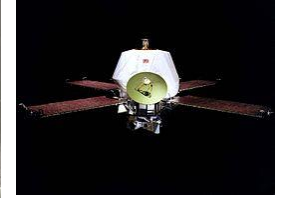Cruise Missiles   Ballistic Missiles

Surrounded by the new test range, the Lighthouse has been witness to thousands of launches from the development of the Bumper to the development of the Falcon (Space X) and to the growth of America's space program.
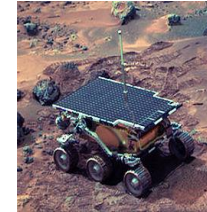
Explorer I   1958
America's 1st Satellite

Surveyor I   1966
1st unmanned lunar landing

Mariner 9   1971
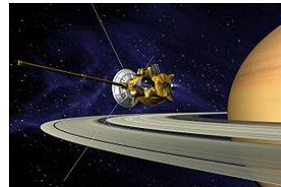1st spacecraft to orbit Mars

America Explores the Solar System
From Cape Canaveral

Mars Pathfinder   1996
1st Mars Rover

Pioneer   1978
1st U.S. spacecraft to orbit
and land on Venus

Cassini-Huygens 1997
1st spacecraft to orbit Saturn

Messenger   2004
1st spacecraft to orbit
Mercury

America's Man-in-Space program also started at Cape Canaveral

Project Mercury

Project Gemini

Unmanned flights

First manned Apollo flight