# WHAT WILL I FIND AT A LIGHTHOUSE STATION?

The light that shines from a lighthouse is at the top of the tower so that it can be seen far out at sea. In the past, the light came from a fire in a room called the lantern, and there was a ventilator directly above the lantern to stop it from getting too hot. Today, the lantern houses a very powerful electric lamp that is designed not to get too hot, and the ventilator is just a decoration.

Before the invention of electric controls, the lamp was rotated on a pedestal powered by gears, pulleys and weights. Each lighthouse would have had a lighthouse keeper whose job it was to set this mechanism, a bit like an old-fashioned clock. The rotating mechanism would have been below the latern in the watch room, where the lighthouse keeper would observe the weather and control the beam of light.

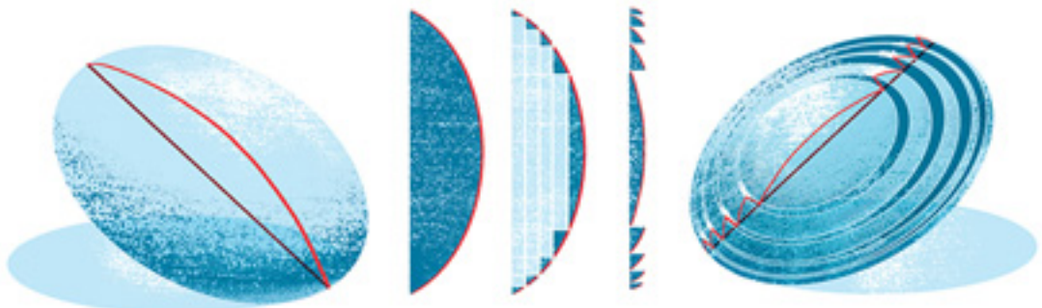
Since lighthouses are often the tallest point on the coast, they are a target for lightning during thunderstorms. A spire on the very top of the tower acts as a lightning rod, drawing the dangerous lightning towards it and away from the important parts of the lighthouse. The other buildings around the lighthouse make up the lighthouse station and contain everything needed to keep the lighthouse going.

# HOW DOES THE LIGHT SHINE SO FAR?

Lighthouses need a powerful source of light that skippers can see from very far away. Electric lamps, oil lamps or gas lamps are too weak on their own. This is especially the case in the misty, coastal air, because the mist causes the light to dissipate (disappear) more quickly than it would in clear air.

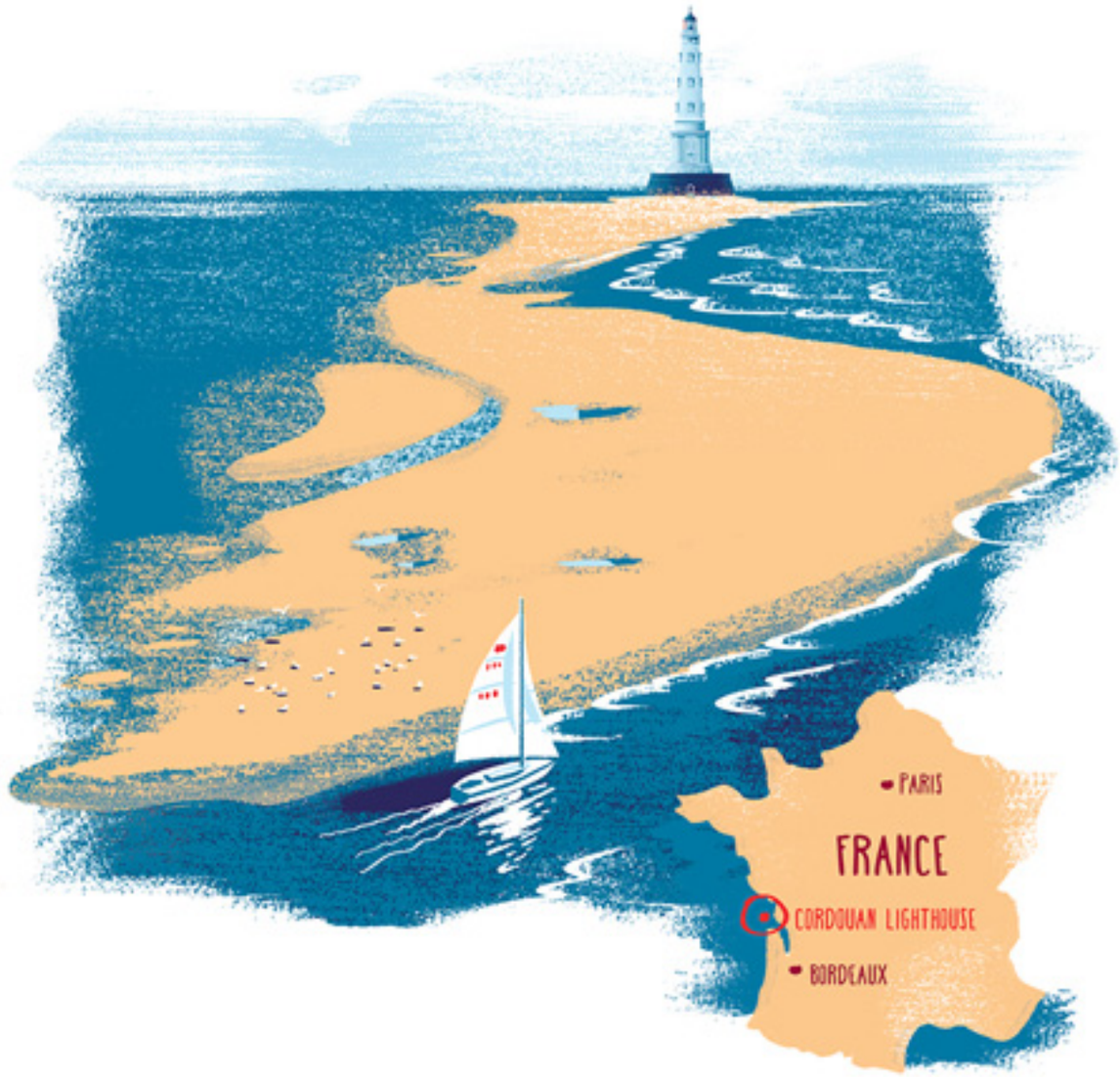
AUGUSTIN-JEAN FRESNEL

In the 1800s, a French physicist called Fresnel came up with a way of capturing the light from a lamp and making it more powerful. Fresnel's idea was to make an optic from several very thin lenses working together to direct all the light from the lamp into one strong beam. Fresnel's design was lightweight, could be big or small and it did not overheat.



TYPICAL LENS

OPTIC USING FRESNEL'S IDEA

A typical lens is made of a single piece of glass so a big lens would be very heavy and difficult to make. By making an optic from several lenses, Fresnel came up with good way of making the light from the lamp stronger.

The Cordouan Lighthouse is one of the most famous lighthouses in the world. It is the oldest lighthouse in France and has been active since 1611, which makes it over 400 years old. It was built just under 4 nautical miles (4 and a half miles) off the coast of Bordeaux in one of the most hazardous places for ships sailing in and out of the port. Its present height is about 226 feet (68 metres), and it is one of the tallest lighthouses in the world. In 1832 the Cordouan Lighthouse became the first lighthouse to install a Fresnel lens.