



Smithsonian
Science Education Center

How Would You Design a Lighthouse?

Level: Grades K-3



Image: vovashevchuk/istock/Getty Images Plus

Your challenge

In this activity you will learn what problems lighthouses solve. You will design and build a model lighthouse.



Handy Hint

Use the glossary at the end of this activity to look up any words you don't understand. Words in the glossary are in **bold**.



Part 1: Problems at sea



Image: dancha/istock/Getty Images Plus

You will need:

- Smithsonian Science Stories: *Shining the Light*
- Paper and pencil

Steps:

1. Find the story “Lighting the Way” in Smithsonian Science Stories: *Shining the Light*. Read the first section, Problems at Sea, or have someone read it to you.
2. Draw a picture or write about one **problem** from the story. Explain the problem to a friend or family member.
3. Read the second section of the story, Lights in the Water, or have someone read it to you.
4. Explain to someone how a **lighthouse** solves the problem from Step 2. Explain how the light helps solve the problem.



Take It Further

Do you want to learn more about lighthouses and light? Check out these Smithsonian resources:

Lighthouse Map

This webpage provides more information about the lighthouses pictured in “Lighting the Way.”

How Can I Win a Game of Flashlight Tag?



This is an at-home activity where you can explore what happens when light shines on different materials.

Part 2: Lighthouse parts

You will need:

- Smithsonian Science Stories: *Shining the Light*
- 1 Lighthouse sheet, printed
- Paper and pencil
- Coloring materials (optional)

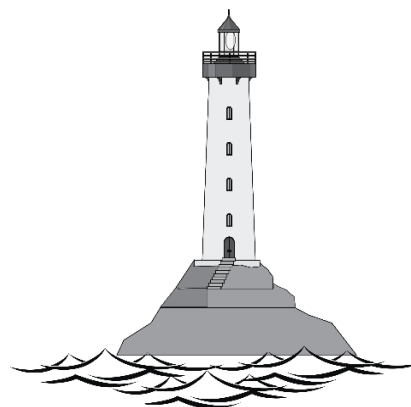


Image: nevro2008/iStock/Getty Images Plus

Steps:

1. Find the story “Lighting the Way” in Smithsonian Science Stories: *Shining the Light*. Go to the second section of the story, Lights in the Water, and look at all the lighthouse pictures.
2. Look at the lighthouse sheet. Write the names of different lighthouse parts on the sheet. You can look at the story for ideas. If you can’t print a sheet, draw your own lighthouse picture on a blank piece of paper and label the parts.
3. Look at two or three lighthouse towers. Explain to someone the ways they are similar. Explain to someone the ways they are different.
4. What words describe the shape of a lighthouse tower? Share those words with someone or write them on your lighthouse sheet.
5. What words describe the shape of the part of the lighthouse that holds the light? Share those words with someone or write them on your lighthouse sheet.
6. If you want, color the lighthouse sheet.



Image: Logan Schmidt, Smithsonian Science Education Center



Part 3: Daymarks

You will need:

- Smithsonian Science Stories: *Shining the Light*
- 1 New lighthouse sheet, printed
- Coloring materials

Steps:

1. Read about **daymarks** in the box at the bottom of this page or have someone read it to you.
2. Look at the lighthouse pictures in "Lighting the Way." How many different daymark designs do you see? Show two different designs to someone else and explain how they are different.
3. Draw a daymark pattern on your new lighthouse sheet. Color it so that it looks different than any of the lighthouses in "Lighting the Way."
4. Challenge someone else to color a lighthouse sheet with a different pattern than the one you drew.



Images on this page: MJB Rogers, Smithsonian Science Education Center

Daymarks

Not all lighthouses have lights. These towers are called daymarks. They are useful during the day.

The word "daymark" is also used for the designs painted onto lighthouses. Different lighthouses in an area are decorated in different ways. This helps people on ships know which lighthouse they are near.

Part 4: Design a model lighthouse

You could use:

- Paper and pencil
- Items from your recycling bin or craft supplies
- Tape or glue
- Small battery-powered light (optional)

Remember to ask an adult before you use anything!

Steps:

1. You have learned about the problems a lighthouse can solve. You have learned about the parts of lighthouses and patterns on lighthouses. You are ready to design and build a model lighthouse.
2. What is a **model**? There are many kinds of models. A lighthouse picture is one kind of model. It shows you what a lighthouse looks like, but it isn't an actual lighthouse. Do you have any models? If you do, show one model to someone and explain what it is a model of.
3. Your lighthouse model will be smaller than a real lighthouse. It might not work exactly like a lighthouse does. It should be shaped like the lighthouses you have looked at. It does not have to have a light.
4. Ask an adult for permission and help finding things you can use to build a model lighthouse.
 - a. Think about the shape of lighthouse towers. What can you find that would make a good tower?
 - b. Think about the part that holds a light. What can you find that is shaped like what you saw in the pictures?
 - c. Look at the things in the picture on this page. Do you have things like these? How could you use them to build a model lighthouse?
5. Do you have all your building items?
Draw a picture of how you think they can be put together to make a model lighthouse. This is your **design**. Explain your design to a friend or family member.





Part 5: Build a model lighthouse

You will need:

- Your design drawing from Part 4
- Items from your recycling bin or craft supplies
- Tape or glue
- Small battery-powered light (optional)
- Paper and pencil

Remember to ask an adult before you use anything!

Steps:

1. Use the materials you collected to build a model lighthouse.
2. Look at your design drawing as you build. Are you putting the pieces together the way you drew it?
3. It is okay if you change your design as you build. When you are done building, draw your final design.
4. Show your model and drawings to a friend or family member.
5. If you put a light in your model, test to see how far away you can get from the light and still see it. Put your model in a dark room and see if you can see the light.
6. Explain the problem your model lighthouse would solve. Explain how the real lighthouse would solve the problem.

Glossary

daymark	A tower without a light used to guide ships in the daylight The pattern painted onto or built into a lighthouse
design	A drawing, model, or plan of something made or to be made
lighthouse	A tower with a bright light that guides ships away from danger
model	Something that represents a real thing
problem	Something that people want to change or fix