

All About Stars

Investigation Data Sheet



How Do Mirrors Collect Light?

Scientists use instruments called telescopes to learn about the universe. The job of a telescope is to collect light from far away stars and space objects using curved lenses and mirrors.

Objective

Demonstrate how concave and convex mirrors collect and focus light differently.

Materials

- 2 sheets of plain white paper
- a table
- tape
- a flashlight
- a comb
- a magic marker
- a large, shiny spoon, which will act as a mirror

Safety Notice: All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

Procedure

1. Lay a piece of paper flat and tape it to the edge of a table. Turn off the lights. Lay the flashlight on the paper and turn it on.
2. Take the comb and place it in front of the light. You should see a series of light rays spreading out from behind the comb.
3. Place the spoon in front of the light rays so that the back of the spoon is facing the flashlight. (Be sure to place the paper and spoon at the edge of the table so that the rays are reflected from the center — not the edge — of the spoon.)
4. Use your marker to trace the pattern of light rays you see on the paper. Label this paper "convex".
5. Put a new sheet of paper under the flashlight and direct the light rays shine into the bowl of the spoon.
6. Using your marker, trace this pattern of light rays onto the paper and label it "concave."
7. Now compare the two pieces of paper labeled convex and concave.
 - Which one shows the light rays curving outward?

 - Which one shows the light rays curving inward?

8. Draw and label both patterns here.

Conclusions

- Look at your reflection from the back and the front of a shiny spoon. Compare the images. What do you see when you use the back of the spoon (the convex side) as a mirror?

- Do things look the same when look at your reflection in the front (the concave side) of the spoon? Explain.

- Concave and convex mirrors are both used in telescopes. If you were a scientist building a telescope to study the stars, which type of mirror would you use in your telescope? Why?
