Reflection of Light With a Plane (Flat) Mirror—Trace a Star

Objective

The student will experiment with reflection by using a plane mirror.

Science and Mathematics Standards

Science Standards

☑ Science as Inquiry
☑ Physical Science

Mathematics Standards

☐ Problem Solving
☑ Communication
☐ Connection
☐ Computation/Estimation
☑ Measurement

Theory

Flat mirrors are also called plane mirrors. Light rays that fall upon a surface are called incident rays. The angle at which light strikes a plane mirror from an object is called the angle of incidence. The angle at which light is reflected from the mirror is called the angle of reflection.

Materials

- 2 blocks of wood 8 inches long
- 1 piece of cardboard 8 inches × 5 inches
- 1 mirror tile (1 foot square backed with heavy cardboard sealed on the edges with thick tape)
- thick tape (duct tape)
- heavy cardboard
- tracing patterns (on page 15)
- pencil
- paper, white

Procedures

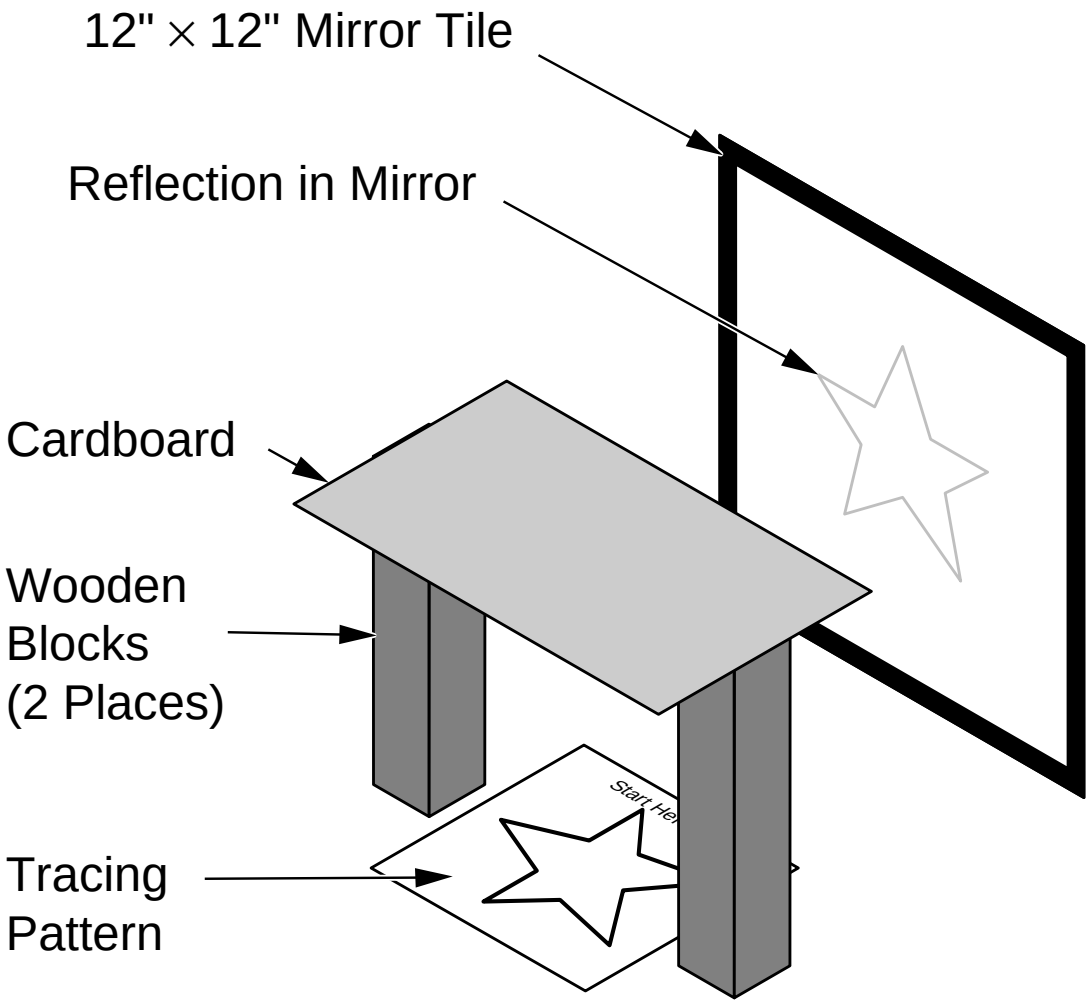
1. Stand the mirror at 90 degrees to the surface of the table.

2. Stand the two wooden blocks on the ends. Position them parallel to each side of the mirror and 10 inches from the face of the mirror.

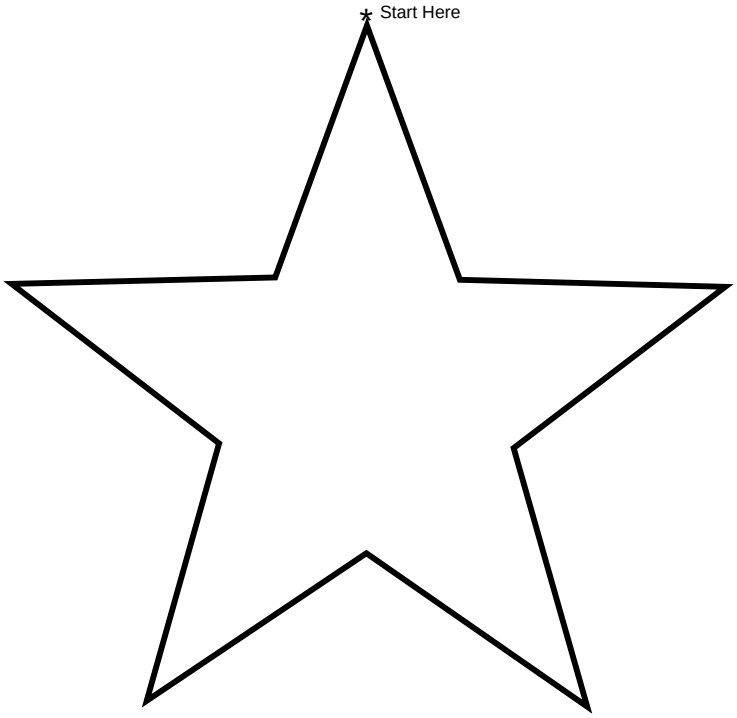
3. Place the cardboard horizontally across the top of the two wooden blocks. Place a paper tracing pattern on the flat surface between the two blocks of wood.

4. Place your finger or pencil at the starting point on the pattern.

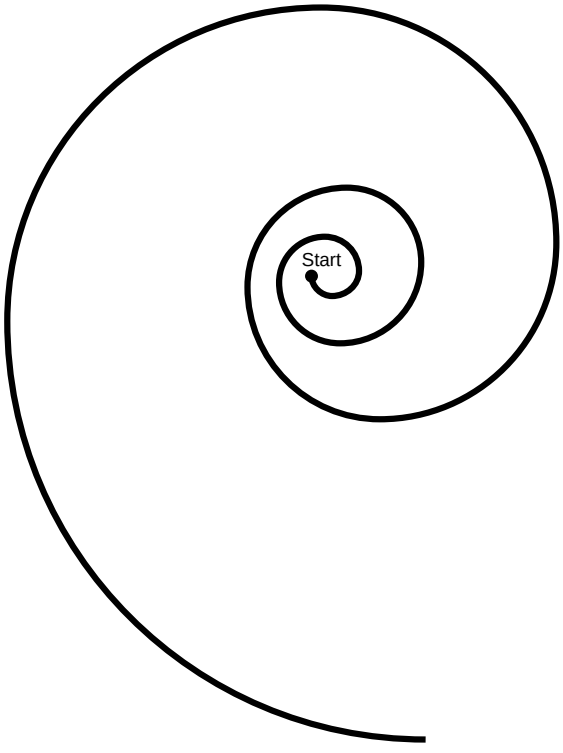
5. Look only in the mirror and trace the star pattern found on page 5. Now trace the swirl pattern also on page 5.



Tracing Pattern #1



Tracing Pattern #2



Observations, Data, and Conclusions

1. What did you learn after tracing the two patterns?
2. What information did your eyes give you?
3. What information did your brain or body give you?
4. Where did the hand in the mirror seem to be located when you looked in the mirror?
5. Is it harder to trace a pattern with your finger or with a pencil? Why?
6. What characteristic of light did you learn about when you did this activity?
7. After completing these questions, draw some designs of your own. Exchange your designs with another student and trace their designs.

Design Page