

Creative Gears

Purpose

To use gears to make pictures and patterns

Procedure

1. Use the ruler to find the center of the 30-cm x 30-cm cardboard square.
2. Using the compass, draw a 22-cm diameter circle in the center of the cardboard.
3. Carefully cut out the circle to create a hole in the cardboard.
4. Use the tape to measure the circumference inside the circle.
5. Cut a strip of corrugated cardboard the circumference of the hole and 2 cm wide.
6. Glue the strip to the edge of the hole so that the corrugations face outward. Make sure that one edge of the strip is level with the edge of the hole. See diagram 1.
7. To create gear wheels, use the tape to measure the circumference of each lid.
8. Cut strips of corrugated cardboard to fit the circumference of each lid by 2 cm wide.
9. Glue strips onto the outer edge of each lid with the corrugation facing outward.
10. Using a nail, make 3-4 holes at different distances from the center in each lid. The holes need to be large enough for the point of your pencil to fit through.
11. Place a sheet of drawing paper on the foam board.
12. Place the corrugated cardboard square on top of the paper and use push pins to secure it in place.
13. Choose a gear wheel (lid) and place it on the drawing paper in the hole in the cardboard.
14. Choose a colored pencil and place the point through one of the holes in the gear wheel so that it touches the paper.
15. Hold the foam board firmly with one hand and use the pencil to push the gear wheel around the inside of the large hole. See diagram 2.
16. Continue to use different gear wheels and different colored pencils to create beautiful patterns and designs.

Conclusion

1. Some patterns will repeat after just a few turns, while others may take many turns before they start again. Describe how you created patterns by using each gear wheel.
2. Explain how the number of teeth on the gears and the position of the pen hole affect the pattern.
3. What variables could you change to create different patterns?

Materials

30-cm x 30-cm cardboard
drawing paper
colored pencils
corrugated cardboard
push pins
compass
scissors
glue
metric ruler
metric tape
35-cm x 35-cm foam board
various sized jar lids
nail
hammer

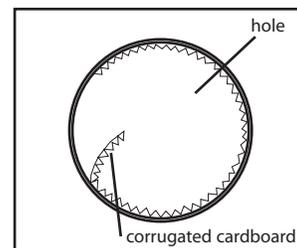


Diagram 1

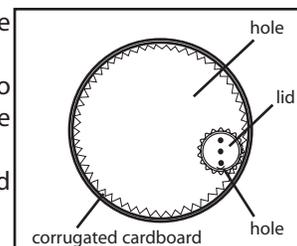


Diagram 2

