Chapter 10

Symmetrical Designs

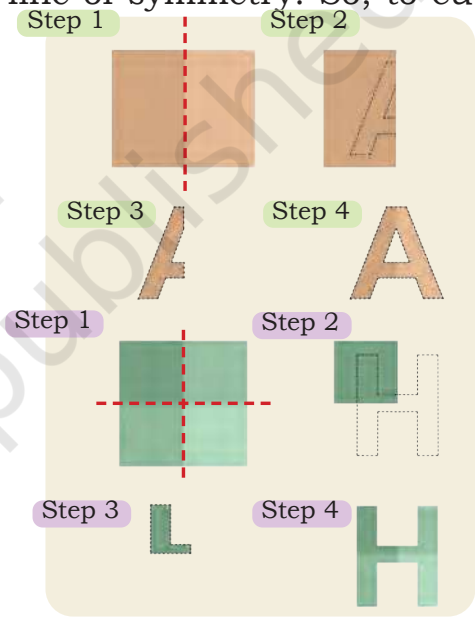


Alphabet Cutout

Prem and Manu want to paste 'Happy Birthday' cutouts on a wall for Lali's birthday. While preparing cutouts of letters, they observe that some letters can be cut out in an easy way.

They remember that they learnt about reflection symmetry and lines of symmetry in Grade 4. They used their knowledge of lines of symmetry to make the cutouts. The letter A has a vertical line of symmetry. So, to cut out the letter 'A'—

1. Fold a paper in half.
2. Draw half of the letter A along the fold.
3. Cut along the outline.
4. Open the paper to see the full letter A.



The letter H has two lines of symmetry.

1. Fold the paper into one-fourth (once vertically, once horizontally).
2. Draw one-fourth of the letter H along the fold.
3. Cut along the outline.
4. Open the paper to see the full letter H.

Which of the following alphabet cutouts can be made by just drawing half ($\frac{1}{2}$) or quarter ($\frac{1}{4}$) of the letter? You can do it by drawing lines of symmetry on the letters.

E N X T K V O

Which of the letters have a horizontal line of symmetry? _____
Which of the letters have a vertical line of symmetry? _____
Which letters have both vertical and horizontal lines of symmetry?_____

Let Us Do

Use lines of symmetry to make paper cutouts of diya, boat, and other designs. Look along the border of the page to find the pictures.

© NCERT not to be republished

Let Us Make a Windmill *Firki*

Lali makes firkis for her friends. Follow the steps given below to make your own *firki*.

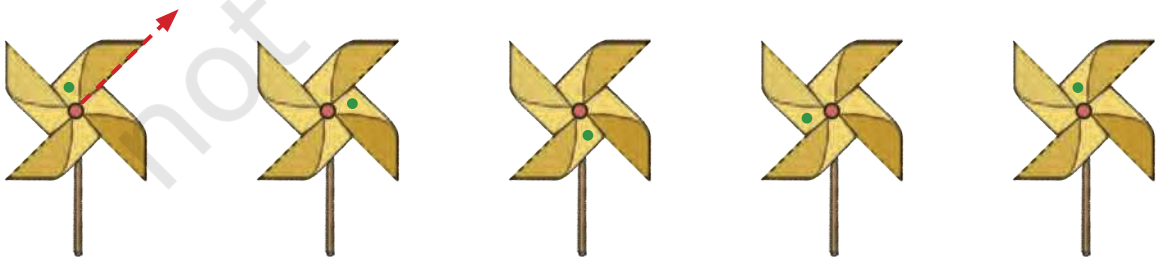
1. Take a square paper. 
2. Fold the paper in half diagonally to make two triangles. 
3. Open and fold it the other way to make two more triangles. 
4. Open it again. You will see an 'X' shape on the paper. 
5. Use scissors to cut along the four lines of the 'X'. Stop cutting about halfway to the centre. 
6. Take one corner of each triangle and fold it gently towards the centre of the paper. Do not press it flat. 
7. Fold every other corner towards the centre. 
8. Push a pin through the folded corners and the centre of the paper. 
9. Push the pin through a stick or straw.



Make sure the pin is not too tight.

Check if your windmill spins when the wind is blowing.

Observe the dot in the *firki*. Does the *firki* look the same after $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and a full turn? _____.

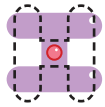
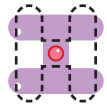


Initial position | $\frac{1}{4}$ turn | $\frac{1}{2}$ turn | $\frac{3}{4}$ turn | Full turn

© NCERT not to be republished

Reprint 2026-27

Observe the letters below. Do they look the same when turned? Dots have been marked on the letters to keep track of the orientation of letters. You may also cut out the letters and fix the centre point of the letter by a nail or use a tracing paper to check if the letter looks the same when turned.

Original letter	$\frac{1}{4}$ turn	$\frac{1}{2}$ turn	$\frac{3}{4}$ turn	Full turn	Rotational symmetry (Yes/No)
					Yes, at $\frac{1}{2}$ turn
					
					
					



The letter H has rotational symmetry, as it looks the same when rotated by half a turn.

A firki has rotational symmetry, as it looks the same when rotated by $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ turn.

Let Us Do

Find symmetry in the digits.

1 2 3 4 5 6 7 8 9 0

Which digit(s) have reflection symmetry? _____

Which digit(s) have rotational symmetry? _____

Which digit(s) have both rotational and reflection symmetries? _____

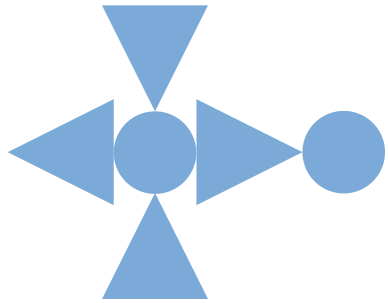
Now, let us look at the following numbers: 11 , 1001

Do these have (a) rotational symmetry, (b) reflection symmetry or (c) both symmetries?

Give examples of 2-, 3-, and 4-digit numbers which have rotational symmetry, reflection symmetry, or both.

© NCERT not to be republished

Making Designs



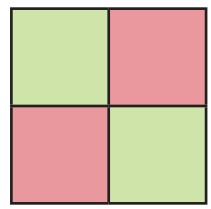
(a) Does the design have rotational symmetry? Yes/No.

(b) Try to change the design by adding some shape(s) so that the new design looks the same after a $\frac{1}{2}$ turn. Draw the new design in your notebook.

(c) Now try to modify or add more shapes so that the new design looks the same after $\frac{1}{4}$ turn. Draw the new design in your notebook.

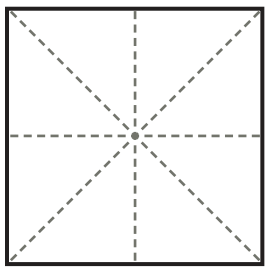
(d) Do the new designs have reflection symmetry? If yes, draw the lines of symmetry.

Let Us Think



Does this design look the same after $\frac{1}{2}$ turn? _____

Does the design look the same after $\frac{1}{4}$ turn?_____



Colour the square given in the adjoining figure using two colours so that the design looks the same after every $\frac{1}{4}$ turn.

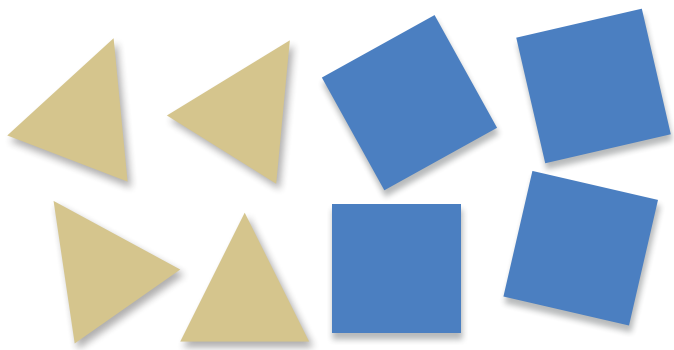
How many times does this shape look the same during a full turn?

Do these designs have reflection symmetry also? Draw the line(s) of symmetry.

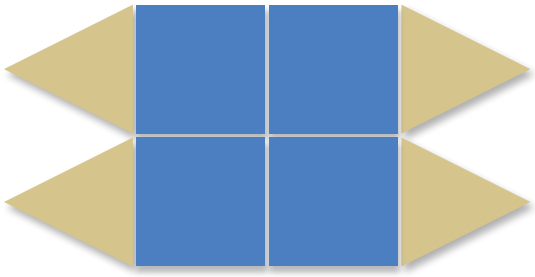
Let Us Do

Cut out squares and equilateral triangles with the same side length. These are provided at the end of the book.

Make different symmetrical designs by using these two shapes.



© NCERT not to be republished



Does this shape have reflection symmetry?

If yes, draw its line(s) of symmetry.

Does it have rotational symmetry?

If yes, at which turn?

Does it have both symmetries?

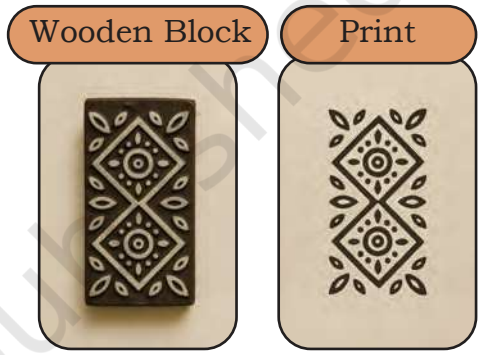
Now, make your designs. Sort your designs in 3 categories—designs with only rotational symmetry, designs with only reflection symmetry, and designs with both rotational and reflection symmetry.

Let Us Explore

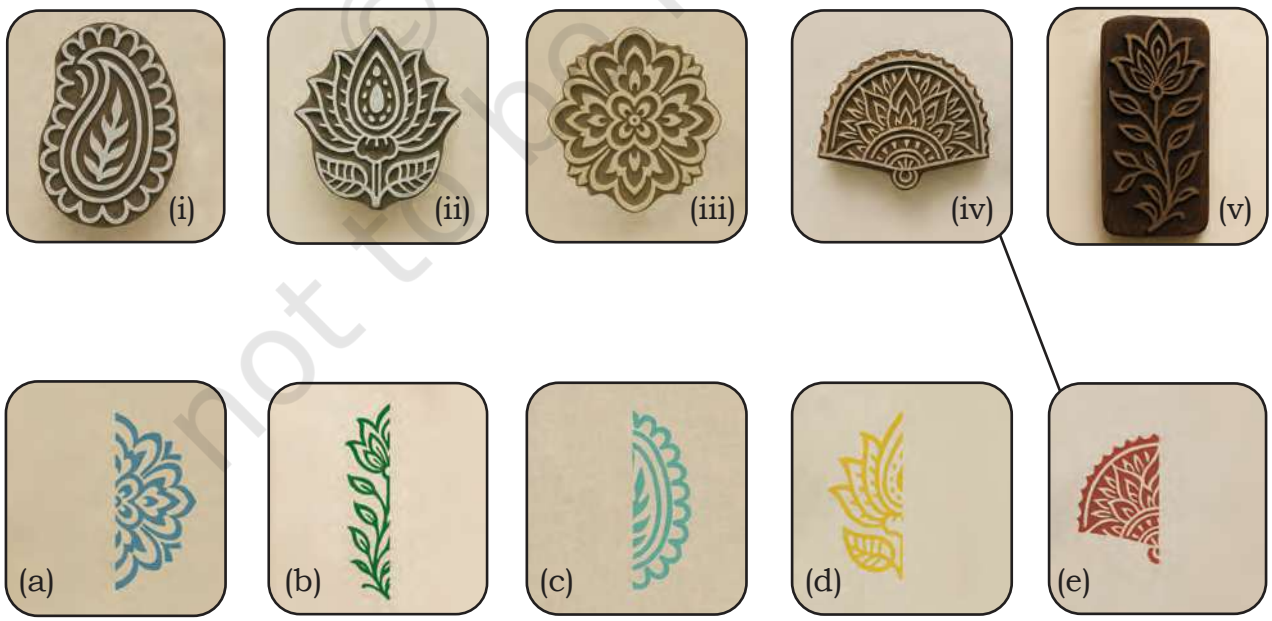
Block printing is a traditional craft of Rajasthan, known for beautiful patterns and bright colours.

Artisans use carved wooden blocks to print designs on fabric.

This art has been practised for centuries and makes Rajasthan's textiles special.



Below are images of wooden blocks and a part of their prints. Match each block to its correct print by drawing a line. One is done for you.



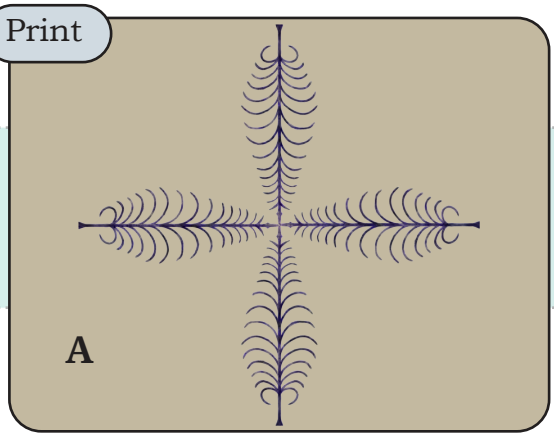
© NCERT not to be republished

Observe the pattern made by the wooden block below. We get the final print by using the block 4 times.

Wooden Block

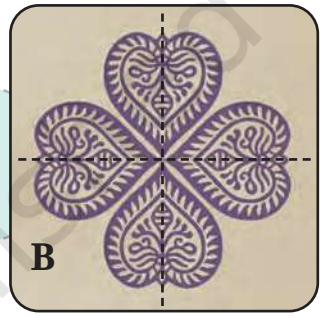


Print



The design A looks the same after every $\frac{1}{4}$ turn.

The design B looks the same after every _____ turn. This design has _____symmetry.



Let Us Do

Observe the shapes given on the border. Which of the shapes have reflection symmetry? Put a (✓) mark on them. Put a * on the shapes that have rotational symmetry.

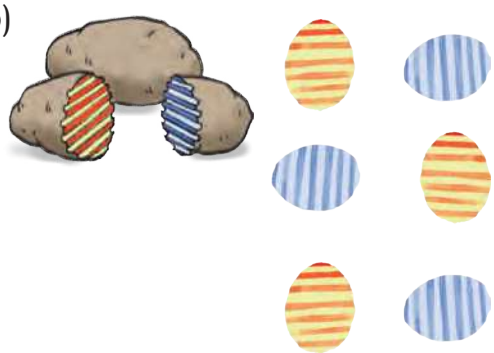
Project Work

Create symmetrical patterns and designs using vegetable blocks. Some are shown below.

(a)



(b)



© NCERT not to be republished