

## Create arabesque art



### Each student will need:

- Sheet of paper (or several, depending on extent of activity)
- Compass
- Sharp pencil and an eraser
  - Ruler or straight edge
- Crayons, colored pencils, chalk, markers, paints, colored tissue paper (optional)

Arabesque art is based on mathematics, space, shape, and pattern, using geometric forms to create intricate designs. The following activity pulls together all these elements in a creative endeavour for students.

Common features of art and tile design during Muslim civilisation were the use of regular geometric figures and their symmetry. All regular polygons can be drawn from within a circle. A circle has no beginning or end, and the figures created from within resonate spiritually in Islamic culture.

Using just a compass and a straight edge, students can inscribe equilateral triangles, squares, pentagons, hexagons, octagons, as well as many other regular polygons inside a circle they have drawn on the paper.

Before beginning this project, review the parts of a circle with students: radius, diameter, and circumference; and what the term “regular polygon” means.

The following instructions and diagrams show how students can create a design in the manner of an Islamic artist.

1. Using the compass, make the largest circle possible on a single sheet of paper.
2. Place the point of the compass anywhere on the circle, and use your pencil to mark off the length of the radius to another spot on the circle.
3. Move the point of the compass to that spot and mark off another length. Continue this around the circle until you come back to the start. Six points should be marked off on the circumference.
4. Connect each point with the one next to it to form a regular hexagon. (Fig.1)
5. Now connect every other point. What have you drawn? (Fig. 2)
6. Do this twice to create a six-pointed star. (Fig. 3)
7. Notice that inside the star there is another hexagon. Make another six-pointed star, and see that inside of it is another hexagon. (Fig. 4)
8. Draw as many stars inside your hexagon as you want or as space allows. (Fig. 5 & 6)
9. Erase the outside circle. (Fig. 7)

10. You now have your first Islamic tile design.

Discuss the symmetry of their designs with students. Have them find six straight symmetries. Point out that there is also an internal symmetry of rotating stars.

Students can now add colour to their designs, maintaining symmetry as they do so.

