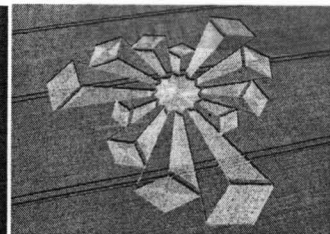
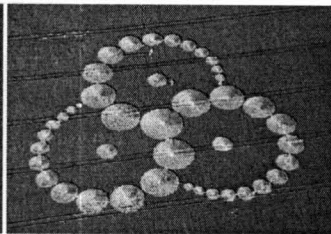
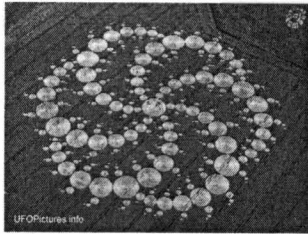


Circle Design

Materials:

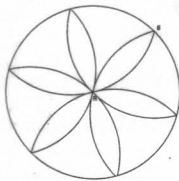
- 1) Scratch Paper
- 2) Compass
- 3) 12" Ruler



Purpose:

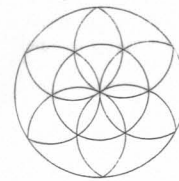
A crop circle is a sizeable pattern created by the flattening of a crop such as wheat or corn. Some people claim that crop circles are made by aliens and must contain a message. We will learn the math behind and the fundamentals of crop circle designs by practicing the designs on this sheet. We will do Design #1 together as a class. Choose from one of the other designs for your assignment and do it on a clean sheet of white paper. In the future, you will make your own unique crop circle design outside. Take pride in your work and have fun!

Design #1



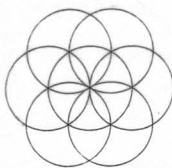
1. Draw a circle near the center of your paper. Label the center point R.
2. Make a point on the circle and label that point S.
3. Using S as the center, draw an arc that passes through R and begins and ends on the circle.
4. Using the endpoints of the arc as centers, draw 2 more arcs that begin and end with the circle.
5. Continue to make arcs, using the endpoints as centers, until you have a flower with six petals inside the circle.
6. Color.

Design #2



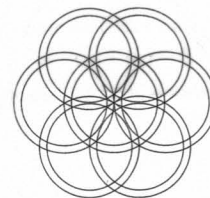
1. Center on the paper a circle with a $3\frac{1}{2}$ -inch radius.
2. Center on the paper a circle with a 2-inch radius.
3. Place the metal point of the compass on the smaller circle and place points at 2-inch intervals around the circle.
4. Placing the metal point of the compass on each point, draw arcs that begin and end on the larger circle.

Design #3



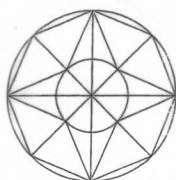
1. Center on the paper a circle with a 2-inch radius.
2. Mark a point anywhere on the circle.
3. Using a compass, mark points at 2-inch intervals around the circle. (The last interval may not be exactly 2 inches.)
4. At each of these points, center a circle with a 2-inch radius.
5. Color.

Design #4



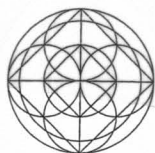
1. Center on the paper a circle with a 2-inch radius.
2. Using the same center point, draw a circle with a $1\frac{3}{4}$ -inch radius.
3. Mark a point anywhere on the outer circle.
4. Using a compass, mark points at 2-inch intervals around the circle. (The last interval may not be exactly 2 inches.)
5. Center a circle with a 2-inch radius at each point.
6. Inside each circle, using the same center point, draw another circle with a $1\frac{3}{4}$ -inch radius.
7. Color.

Design #5



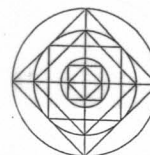
1. Center on the paper a circle with a 4-inch radius.
2. Mark a point anywhere on the circle.
3. Set your compass at 3 inches. Using the compass, mark points at 3-inch intervals around the circle. (The last interval may not be exactly 3 inches.)
4. Connect the points to form an octagon.
5. Connect opposite points to form four diameters.
6. Center a circle with a 2-inch radius.
7. Connect every other point on the larger circle to the points on either side of it on the smaller circle. This will form a four-point star.
8. Color.

Design #7



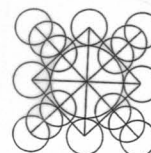
1. Center on the paper a circle with a 3-inch radius.
2. Draw the horizontal and vertical diameters of the circle.
3. Center a circle with a $2\frac{1}{2}$ -inch radius.
4. Center a circle with a $1\frac{1}{2}$ -inch radius.
5. Draw four line segments connecting the endpoints of the radii of the largest circle to form a square.
6. Draw four line segments connecting the endpoints of the radii of the smallest circle to form a square.
7. Using a radius of $1\frac{1}{2}$ inches and the corners of the smallest square as centers, draw four circles.
8. Color.

Design #6



1. Center on your paper a circle with a 3-inch radius.
2. Draw the horizontal and vertical diameters.
3. Connect the ends of the radii to form a square.
4. Mark the midpoints of each side of this square. Connect the midpoints to form a new square.
5. Center a circle with a 2-inch radius.
6. Connect the ends of the radii of this circle to form a new square.
7. Center a circle with a 1-inch radius.
8. Connect the ends of the radii to form a square.
9. Mark the midpoints of each side of this square. Connect the midpoints to form a new square.
10. Can you see what to connect to form a smaller square inside the one that you just drew? If so, draw it.
11. Color.

Design #8



1. Center on the paper a circle with a 2-inch radius.
2. Draw the horizontal and vertical diameters.
3. Extend each diameter 1 inch beyond the circle.
4. Using the new ends of the diameters as center points, draw four circles, each with a 1-inch radius.
5. Connect the centers of the four new circles to form a square.
6. Mark the midpoint of each side of the square.
7. Center on each midpoint a circle with a 1-inch radius.
8. Connect the center of each of the new circles to the one opposite.
9. Extend each radius that you have just drawn in the four new circles to form diameters.
10. Center a circle with a 1-inch radius at the outer end of each new diameter.
11. Repeat the process, extending each radius to become a diameter.
12. Center a circle with a 1-inch radius at the outer edge of each new diameter.
13. Color.