

Benham's Disk

Overview: Charles Benham (1895) created a toy top painted with a specific pattern. When you spin the black and white pattern, surprising arcs of color (called “pattern induced flicker colors”) show up; and here’s the odd part: Different people see different colors!

What to Learn: The color of light striking an object affects how our eyes see it. The cones and rods inside our eyes collect images that are transmitted to the brain.

Materials

- Benham's Disk sheet
- string (about 3 feet)
- 8 index cards
- glue stick

Experiment

1. Cut out the Benham's Disks.
2. Glue the disks to index cards for stability. Regular paper tends to flop around when you spin it quickly.
3. Label each disk with a number from 1 to 6 on the back side so you can record your observations in the data table later.
4. Spin the disks using the method you choose. Play with this a bit before you take data so you can get comfortable with how to do the experiment.
5. When you are ready, record your observations in the data table.

Reading

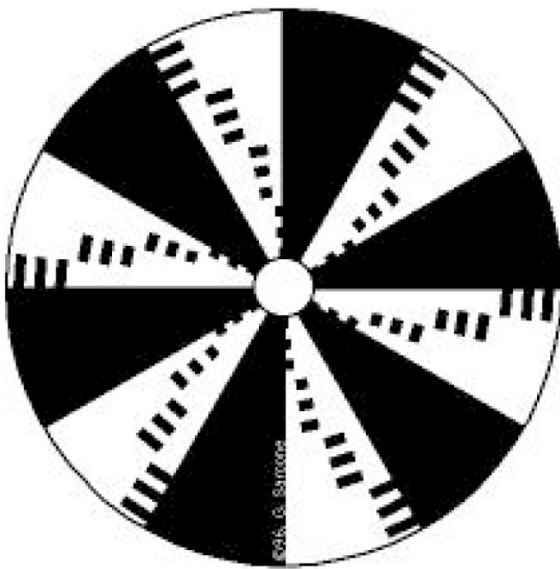
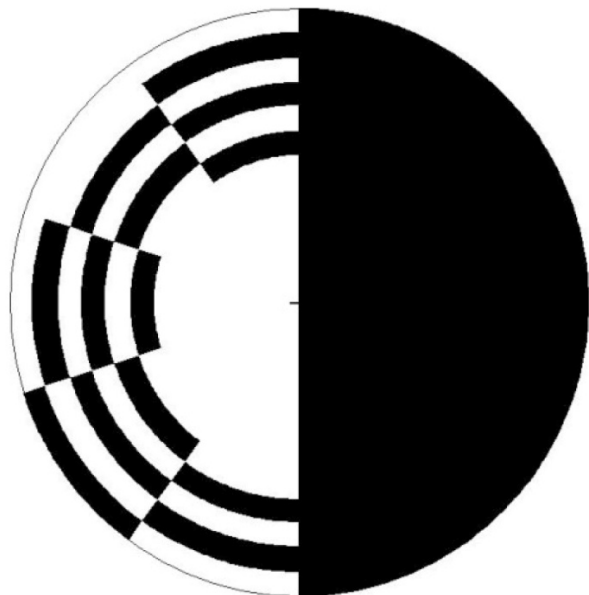
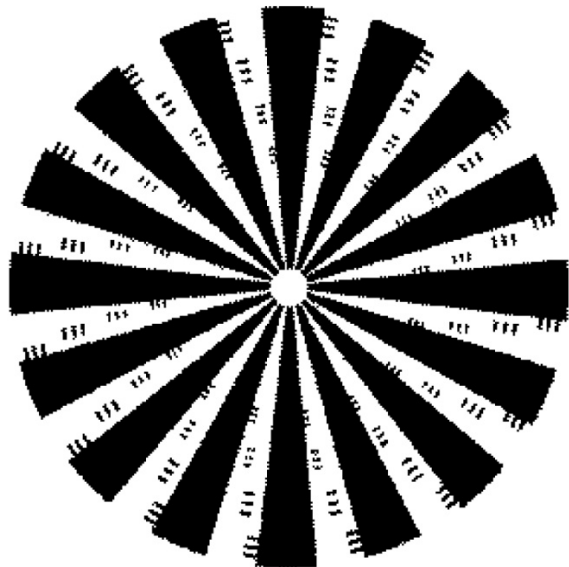
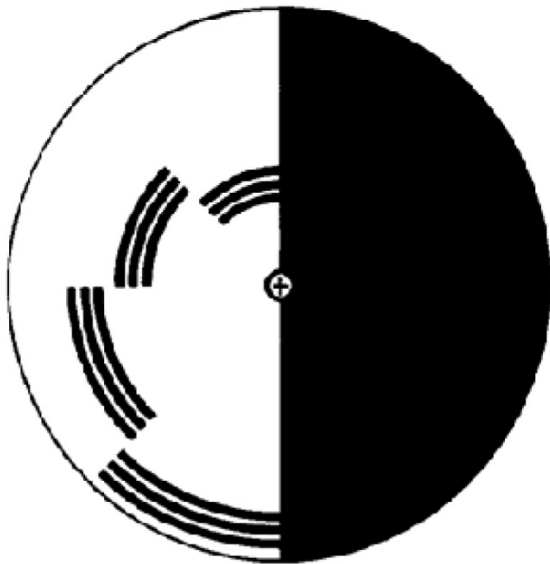
We can't really say why this effect with Benham's Disk happens, but there are a few interesting theories. The retina at the back of your eye has a bunch of light-sensitive cells called cones and rods. Your eyeball has two different ways of seeing light: cones and rods. Cones are used for color vision and for seeing bright light, and there are three types of cones (red, green, and blue). Rods are important for seeing in low light and they sense black, white, and gray shades. Together, they turn the light that enters your eye into an image.

Benham's Disk Data Table

Disk #	What Colors Did You See?
1	
2	
3	
4	
5	
6	
Your Own Design #1	
Your Own Design #2	

Exercises

1. What colors were you able to see when the disks were spinning?
2. How did the different patterns look when they were spun?
3. How did speed and direction affect what you saw?



Benham's Disks

Answers to Exercises: Benham's Disk

1. What colors were you able to see when the disks were spinning? (answers vary)
2. How did the different patterns look when they were spun? (answers vary)
3. How did speed and direction affect what you saw? (answers vary)