

# Parametric Color

Sketchpad allows an object to be a certain color based on some measurement. That is, the color of an object can change based on how near or far it is from another object.

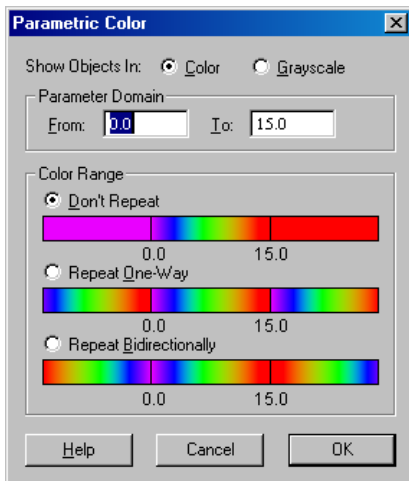
## The Sketchpad Paintbrush

### The Sketchpad Paintbrush:

1. Draw a point (A) on the desktop
2. Draw a segment on the desktop (approx 1 cm)
3. Highlight (select) the point (A) and the segment
4. Click Construct/Circle by Center + Radius
5. Click (with the circle still highlighted) Construct/Circle Interior
6. Click (with the circle interior highlighted) Display/Trace Circle Interior

Parametric Color Example #1:

1. *Construct a Sketchpad Paintbrush*—These are the directions above.
2. Draw a point on the desktop
3. Highlight both the new point and the center of the paintbrush circle
4. Click *Measure/Distance*
5. Highlight both the circle interior and the distance measure
6. Click *Display/Color/Parametric...* you should now see a box similar to this one:



7. The values shown are the ones we need:
8. **Show Object In:** Color should be checked.
9. **Parameter Domain** should be from 0 to 15.
10. **Color Range** should be Don't Repeat.
11. Then click **OK**.

Selected the center of the circle and move it around the screen. Note the color of the circle changes as the distance between the two points changes.

Animate Paintbrush:

- Highlight the center of the circle.
- Click Edit/Action Button/Animation. Change the Speed to Other...10.
- Click OK
- Click the Animation Button and sit back.

If the diagram is not fine enough for you, you can decrease the size of the paintbrush by decreasing the length of the line segment—even while the paintbrush is in motion!

## Example #2

Open a new Sketch

1. *Construct a Sketchpad Paintbrush*
2. Click and hold the segment tools until it becomes the line tool
3. Draw a line on the desktop
4. Highlight the line and the center of the paintbrush
5. Click Construct/Perpendicular
6. Highlight both lines
7. Click Construct Intersection
8. Hide the lines—Highlight the lines and click Display/Hide Lines
9. Highlight the paintbrush center and the point of intersection
10. Click Measure/Distance
11. Highlight the distance measure and the circle interior
12. Click Display/Color/Parametric
13. **Show Object In:** Color should be checked.
14. **Parameter Domain** should be from 0 to 12.
15. **Color Range** should be Don't Repeat.
16. Then click **OK**.
17. *Animate the Paintbrush*

Other Problems to do:

- A point and a line
- Two lines—paint the sum and difference of the distances
- Two points—paint the sum and difference of the distances
- Get the (x,y) coordinates of the paintbrush center and paint their sums, products and differences
- Do the same with repeating colors...(See parametric color menu.)

Fast coloring

1. Create whichever sketch above that you like
2. Draw a vertical line segment on the left edge of the desktop
3. Construct Point on Segment
4. Highlight that point and that segment
5. Click Construct/Perpendicular Line
6. Highlight the paintbrush center and the perpendicular line
7. Click Edit/Merge Point to Perpendicular Line
8. Highlight the circle interior and the center point
9. Click Construct/Locus
10. Click Display/Trace Locus
11. Highlight the point on intersection of the vertical line and the perpendicular line
12. Click Edit/Action buttons/Animate/Move at fast speed bi-directional along segment
13. Click animate