Using Recursion in Graphics

- Recursion can be a powerful tool
- Closely related to Fractals
  - Self-similarity
  - Keep zooming in: still looks the same
- Can produce very interesting figures with very little input
- Serpinsky Gasket is just a lot of triangles
  - Define recursively

Serpinsky Gasket

- Start with triangle
- Then put (1/2 size) triangles within triangle

Rendering a Serpinsky Gasket

- Mathematically, Gasket is defined for infinitely small triangle.
  - Goes on forever
  - Zoom in as far as you like: always the same picture
- In drawing a Serpinsky Gasket what are the issues?
  - Time to draw
  - What can you see
- How do we handle this potentially infinite recursion?
  - What to use as the base case?
  - ???
Serpinsky Demo

- In code directory
  - Using Applet
  - Run Serpinsky.html
- Note feature to slow down drawing
  - Get better sense of how recursive calls work
  - Also see how incredibly fast computer is...
- Review recursive features
  - What is done in the base case?
- What would figure be like if we drew nothing except
  - In the base case?

Classwork/Lab

- Will be doing two different figures recursively
  - Target
  - Circle Art
- For each, will use 2 approaches
  1. One Object: Draw Recursively
     - Our drawing technique will use recursion
  2. Object Creates Other Object Recursively
     - Each object will create “clone” objects using new
     - Each of smaller size and in different positions
     - Will invoke the paint methods of these clones