

Name: _____

Watersheds and Rivers

1. What are the four types of fractal patterns?

a) b) c) d)

2. What type of fractal pattern is a river?

3. Name at least three other types of natural fractals of the same type as rivers.

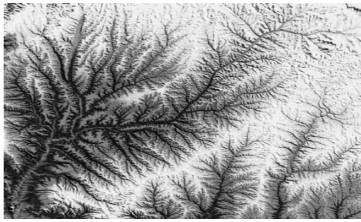
a) b) c)

4. What is a watershed?

5. Now, make your own watershed. You can do this as one large group with a plastic bag and spray bottle of water or each student can crumple up their sheet of paper (not too much!) and then un-crumple it. Once your sheet of paper is open, mark the ridges of your paper or tops of the mountains of your watershed with a marker.

See what happens when you spray water on the landscape! Discuss as a class what you notice about how the water flows in your landscape.

6. In the space below, create a map of your watershed. Draw lines for your river and show where your "mountains" are located. What have you learned about watersheds and rivers from this?



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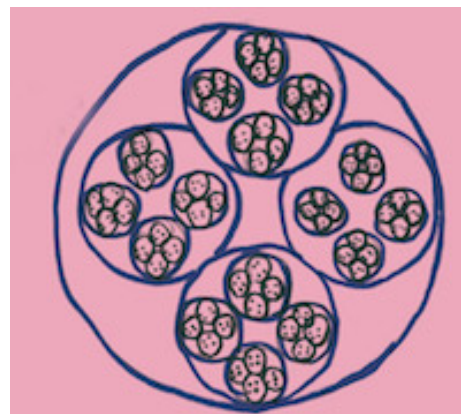
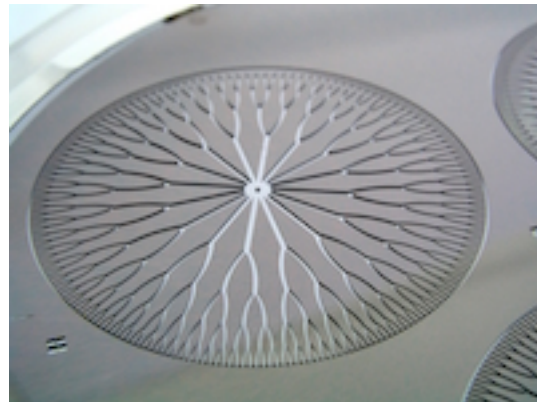
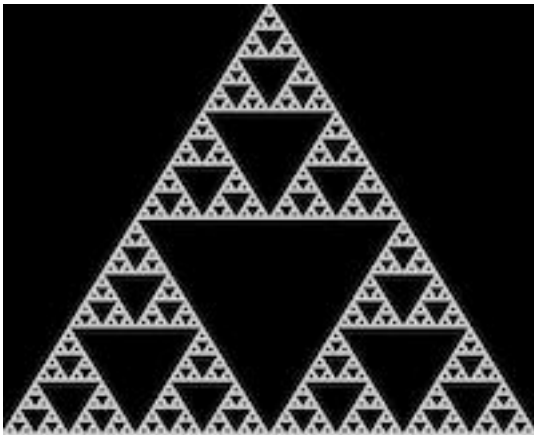
7. Now we are going to have each student or small groups of students (2 or 3 maximum) make their own fractal design with pipe cleaners. Afterwards, we will have a competition to judge who created the best fractal design that covers the most area. Each student gets four whole pipe cleaners, eight half-sized pipe cleaners and 16 quarter-sized pipe cleaners.

Take the next 10 minutes to create your own fractal pattern that would maximize the area covered by pipe cleaners on your desk. Afterwards, the class will judge who or what team created the best design. Use the designs below to help you create your design.

Suggestions on judging the winning design:

Does the pattern exhibit characteristics of a fractal, in repeating a simple design over and over again, getting bigger or smaller?

Does the pattern cover the most large area?



Fractals are SMART: Science, Math & Art!

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