

Name: _____

Watersheds and Rivers

1. What are the four types of fractal patterns?

a) branching b) spiral c) geometric d) algebraic

2. What type of fractal pattern is a river?

branching

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

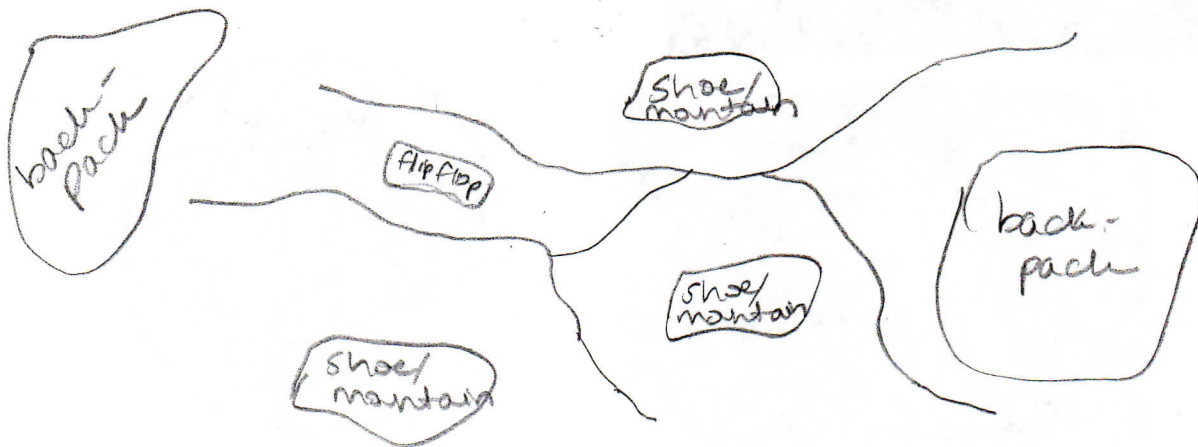
a) Veins
blood vessels b) Cracks in a
sidewalk c) lightning
trees

4. What is a watershed?

a specific area that water flows into based on the topography or landscape

5. As a class, make your own watershed with a plastic bag and spray bottle of water and see what happens when you spray water on the landscape. Discuss as a class what you notice about how the water flows from the top of a "mountain."

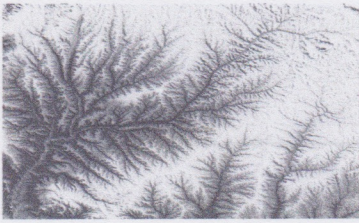
6. In the space below, create a map of your watershed. Draw lines for your river and show where your "mountains" are located. What have you learned about watersheds and rivers from this?



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Watersheds and Rivers

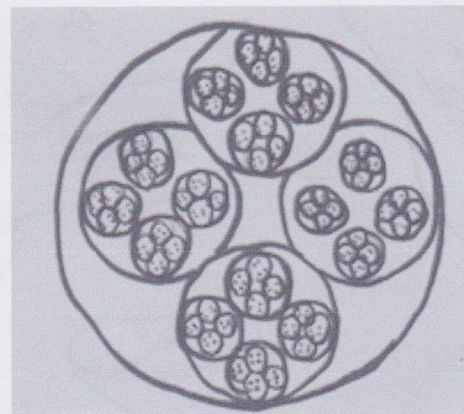
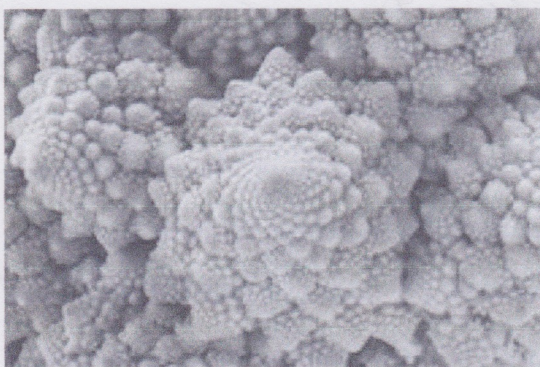
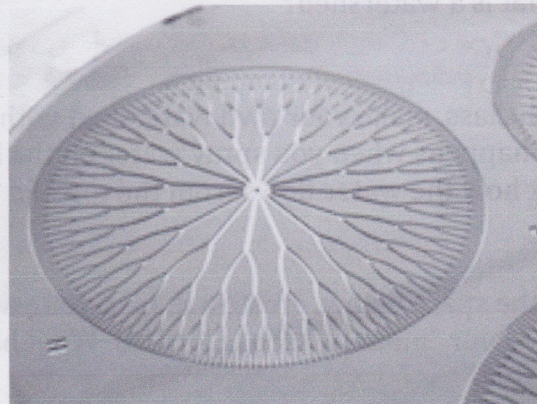
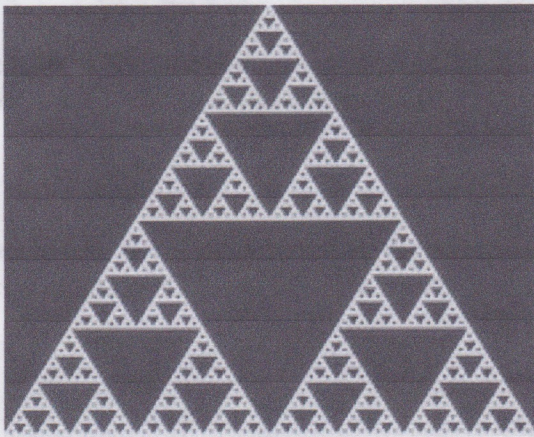
7. Now we are going to have each student or small groups of students (2 or 3 maximum) make their own fractal design with pipe cleaners. Afterwards, we will have a competition to judge who created the best fractal design that covers the most area. Each student gets four whole pipe cleaners, eight half-sized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



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