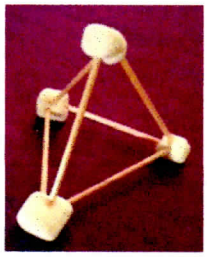
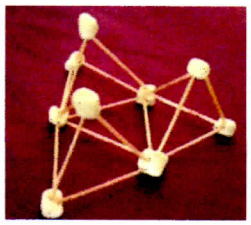
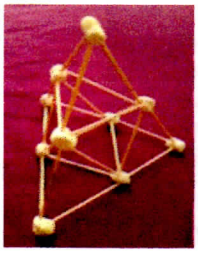




Name: _____

Fractal Tetrahedrons

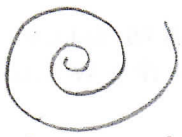
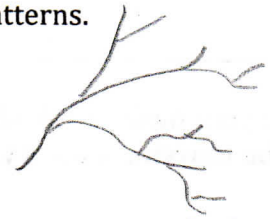
1. What is a fractal?

Include some of the following: a repeated or neverending pattern; simple pattern that, when repeated over and over, makes something complex; gets bigger/smaller

2. What are four types of fractal patterns?

a) spiral b) branching c) geometric/ shapes d) algebraic ↓ need a computer to make these

3. Draw three types of fractal patterns.

a)  b)  c) 

4. The pictures at the top of this page are tetrahedrons. What type of fractal pattern is a tetrahedron?

geometric

5. What does "tetra" stand for? Why is it named this?

both = 4

4 - the tetrahedron has 4 sides to it. tetra = Greek quad = Latin

6. Make your basic tetrahedron.

7. Measure the angles of all the different sides of your tetrahedron.

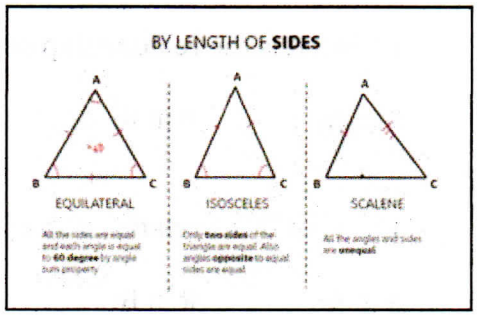
a) What are they? ~60°

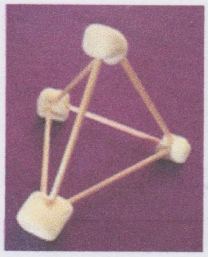
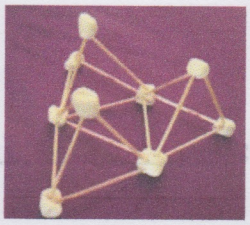
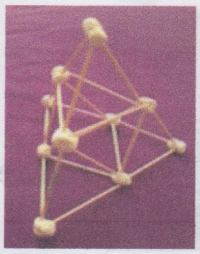
b) Are your angles about the same or really different?

same

c) What type of triangle is your tetrahedron?

equilateral



Name: _____

Fractal Tetrahedrons

8. Now we're going to count and measure. Fill in row A below.

	Tetrahedron	# Toothpicks	# Marshmallows	Length (cm)
A.	Your own (first order)	6	4	7
B.	First group of four (second order)	24	10	14
C.	Second group of four (third order)	96	34	28

9. In your group of four people, combine your basic tetrahedrons together to make a tetrahedron the next size larger. **Save the marshmallows you take off** – they will help you with the next step!

10. Now fill in row B above. How many toothpicks do you have (use a marker to mark the toothpicks you have counted)? How many marshmallows? How long is each side?

11. What is the relationship of the number of toothpicks?

in A: 6 # in B: 24 How do you get from your first number to second one? multiply by 4 4x

12. What is the relationship of the number of marshmallows?

in A: 4 # in B: 10 How do you get from your first number to second one? multiply by 4 + subtract 6 4x-6

13. What is the relationship of the length of each side?

in A: 7 # in B: 14 How do you get from your first number to second one? multiply by 2 2x

Now predict how many toothpicks and marshmallows you have in the next size larger (third order) tetrahedron and write those numbers in your table in row C.