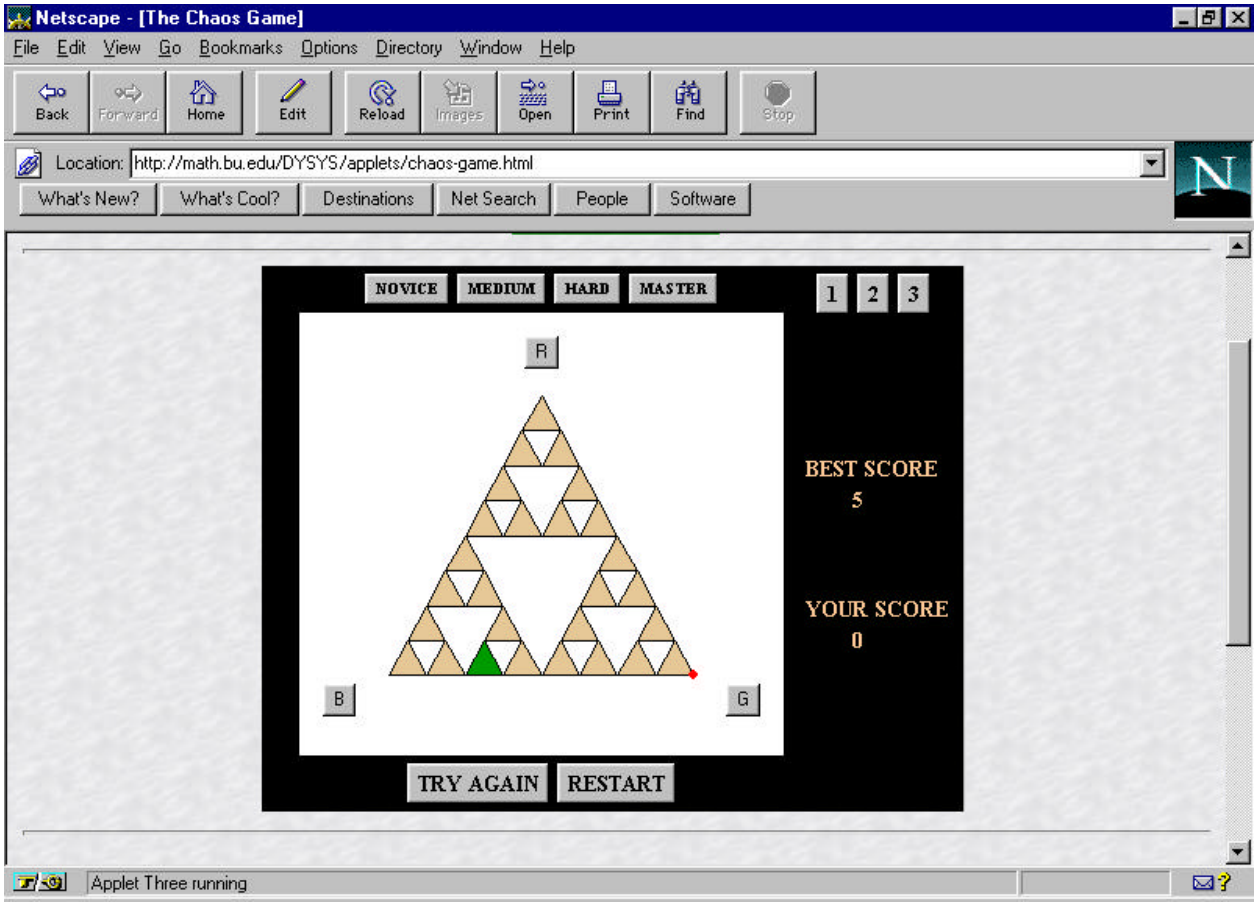
The Chaos Game and Fractal Geometry

Opening the Chaos Game

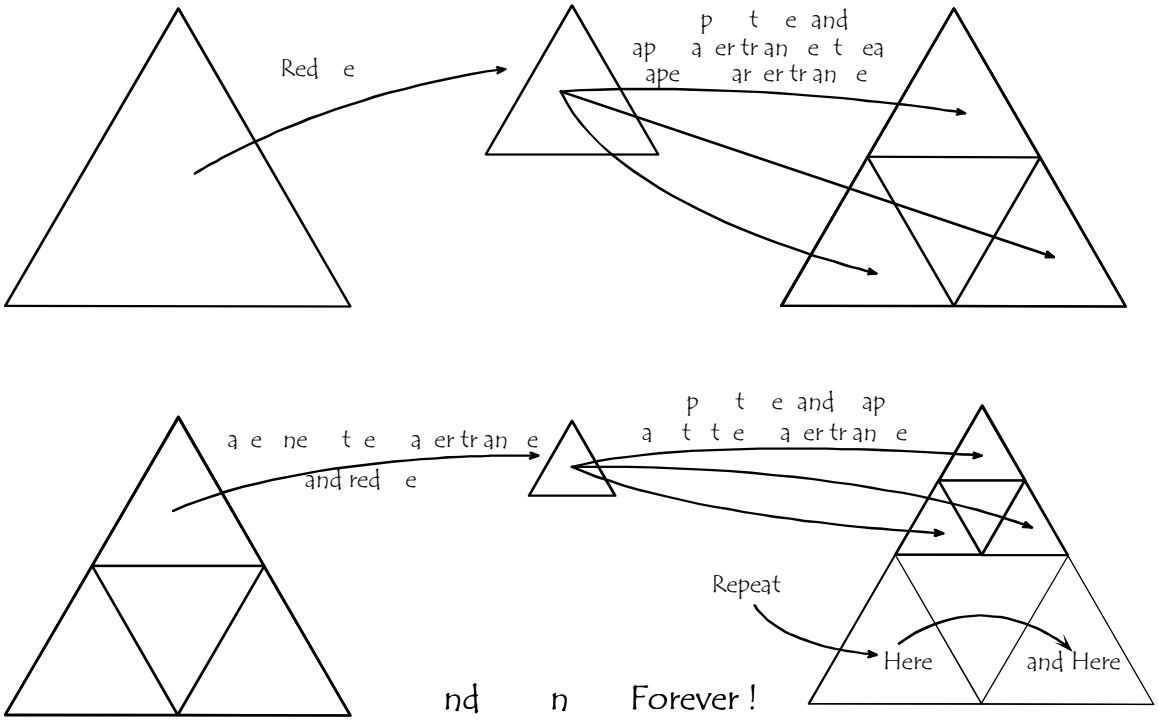
- The Chaos Game is a World Wide Web based program which can be accessed at the address below. The game is designed for learning the iterative steps in generating a specific fractal, the Sierpinski triangle.
  - **http://math.bu.edu/DYSYS/applets/chaos-game.html**
- The program is self explanatory, and you can just follow its instructions and links if you want. On the other hand, we have provided an explanation of the game; that is, what you are trying to accomplish in the game.



Fractals are generated by an iterative process. A common example is the Sierpinski triangle. The triangle is shrunk in size by a certain proportion, copied several times, and then the new smaller versions are mapped (located) in sections of the original triangle. This is done again and again, to infinity.

In addition, all kinds of translations, rotations, etc. may also be done. Some of the pages that accompany the Chaos Game on the Web are a very nice introduction to all this, and if you are interested it is an excellent place to start.

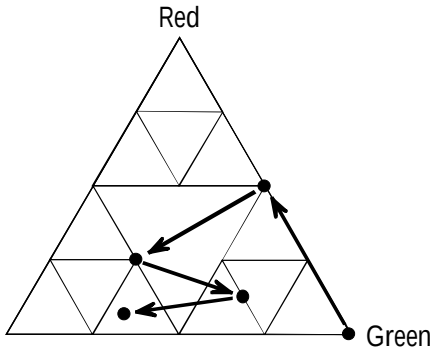
Generating The Serpinski Triangle Fractal



Chaos Game Procedures (the Sierpinski Triangle):

The game is to learn to decipher the fractal iteration sequence: COPY ⇨ REDUCE IN SIZE ⇨ MAP TO A NEW LOCATION. In the game the sequence is to take a dot from one location and through a series of fractal moves get it **inside** a specified triangle.

For example, the triangle here. Start with a dot at the Green apex, and with the fewest number of steps move it to the shaded triangle.



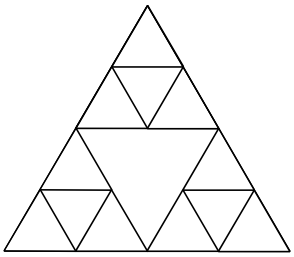
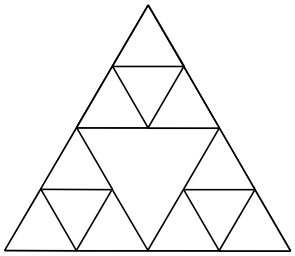
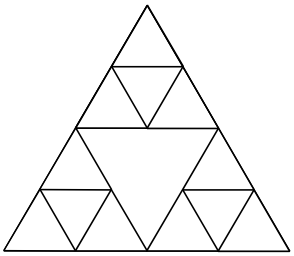
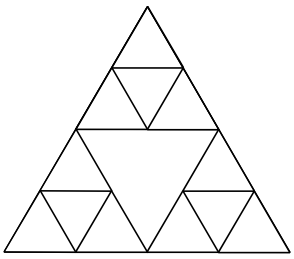
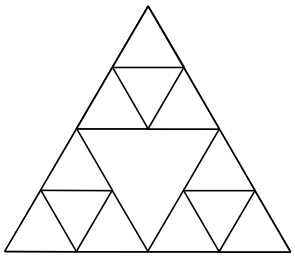
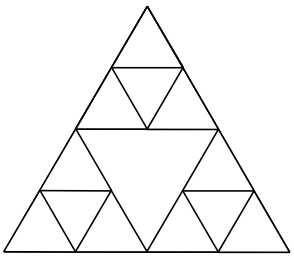
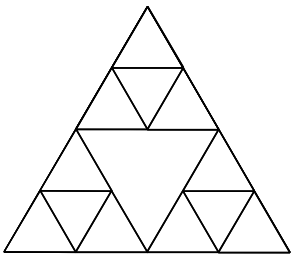
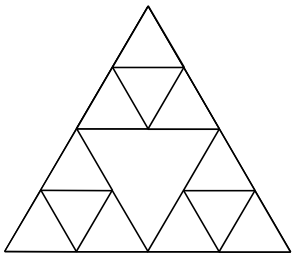
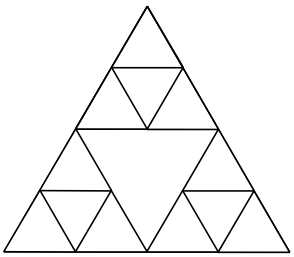
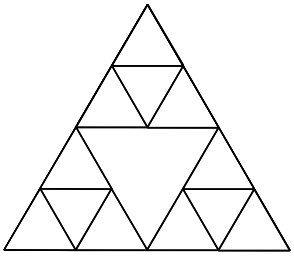
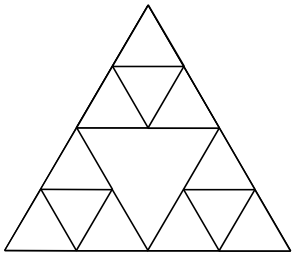
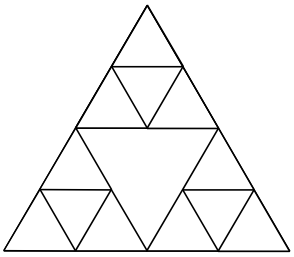
Each move follows the same procedure. Pick an apex (red, blue, or green) and click it. The dot will move half way to that apex. Pick another colored apex and the dot will move half way to that apex. And so on, as to the right.

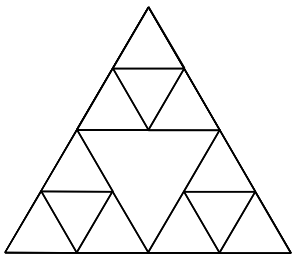
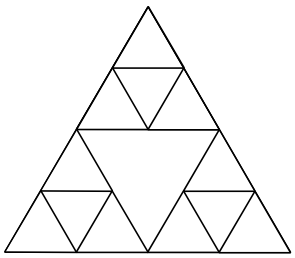
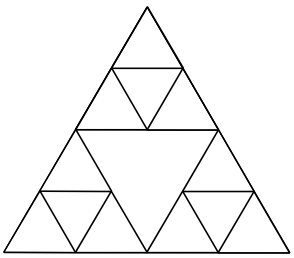
In the Chaos Game ***Try Again*** sets up a whole new situation; Restart allows you to go back to the same game and try again.

1. Experiment Four - The Chaos Game

- ❏ Go to this web address: **http://math.bu.edu/DYSYS/applets/chaos-game.html**
- ❏ Play the game at the novice level until you can get through it within 1 or 2 moves of the best score.
- ❏ Then try several games at one of the other levels, OR try game 2, or 3 (buttons in upper right of game board).

❑ In the spaces provided below you can keep track of your strategies for solving each game. Just shade in the target triangle and the initial dot.

Game One Difficulty____ 	Game Two Difficulty___ 	Game Three Difficulty___ 
Game ____ Difficulty____ 	Game ____ Difficulty___ 	Game ____ Difficulty___ 
Game ____ Difficulty____ 	Game ____ Difficulty___ 	Game ____ Difficulty___ 
Game ____ Difficulty____ 	Game ____ Difficulty___ 	Game ____ Difficulty___ 

Game ____ Difficulty____ 	Game ____ Difficulty____ 	Game ____ Difficulty____ 

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