

LESSON: Fractals, Fractions, & Fun**GRADE: 5****OBJECTIVES:****Measurement & Data-****Convert like measurement units within a given system**

- **5.MD.A.1** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Number & Operations- Fractions**Use equivalent fractions as a strategy to add and subtract fractions**

- **5.NF.A.2** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.* Analyze patterns and relationships.

Geometry-**Classify two-dimensional figures into categories based on their properties.**

- **5.G.B.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

MATERIALS & RESOURCES:

- Access to Internet
- Scratch paper
- Pencils and markers or crayons
- Paper to make Fractal Triangle or other fractal projects

PRESENTATION:

Tell students they will be learning math by learning about fractals. Explain that fractals have important applications in math, science, social studies and art. Understanding fractal concepts can be useful in solving problems in real life.

DIRECTIONS:

1. Access [Fractal Foundation](http://fractalfoundation.org/) website at <http://fractalfoundation.org/>. If students are not already familiar with fractals, have them explore the concept of fractals by using the website in small groups or individually. The [Educator's Guide](#) is a good tool.
<http://fractalfoundation.org/fractivities/FractalPacks-EducatorsGuide.pdf>
2. Print the worksheets; [Fractal Rivers](#), [Fractal Trees](#) and [The Fractal Apple Tree](#)
<http://fractalfoundation.org/resources/fractivities/fractalrivers>
<http://fractalfoundation.org/resources/fractivities/fractaltrees>
<http://fractalfoundation.org/resources/fractivities/fractontree>
3. Go outside and find real examples of fractals in nature or garden.
4. Have students complete the worksheets, which offer opportunity to practice multiplications, division of fractions and whole numbers, relating geometric ideas to numbers, and many more math skills.
5. Additional activity: [Triangle Fractal Cutout](#)
<http://fractalfoundation.org/resources/fractivities/fractal-cutout/>

TIME:**45-60 min.**