

Sell! Sell! Sell!

Using recursion and fractals to understand the decreasing wildlife habitat of the west

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This lesson allows students to formulate an understanding of the recursive process, iterations, and geometric patterns while giving them a contextual basis to introduce the ideas of geometric patterns, limits, and fractal geometry.

Grade level: 7-8

Montana Standard 1 -- Students engage in the mathematical processes of problem solving and reasoning, estimation, communication, connections and applications, and use appropriate technology.

Montana Standard 7 – Students demonstrate understanding of and an ability to use patterns, relations, and functions.

Materials: Sell! Sell! Sell! Worksheet

Ruler

Colored Pencils

Fine graph paper

Class time required: 2 class periods

Objectives: Students will use the real-life application of land development and decreasing wildlife habitat to form an understanding of reiteration, geometric sequences, and fractal geometry. Students will discuss various aspects of wildland management and habitat integrity while forming an appreciation of the application potential of mathematics.

Files: Sell! Sell! Sell! Worksheet

Fine graph paper

Assessment:

Option 1 -- After students have discussed the other options for the location of the wildlife habitat and worked through the activity, they may graph the remaining area after the first, second, and third sales of a different strategy. Students will then write a paragraph describing the advantages of the new sale strategy as it relates to wildlife optimization.

Option 2 – Students will research other instances of where the pattern created in the activity is seen, used, or advantageous. They will organize a presentation, including visual examples. This presentation will include historical uses, i.e. quilting, native artwork, architectural detail.

Option 3 – Students will choose a mathematical idea introduced to explore. They can discover the idea of approaching the limit, the ratios of subsequent terms, geometric sequences, infinite series, recursion, and show the application of the idea in various setting, i.e. financial, architecture, population growth, etc.