Square Off!

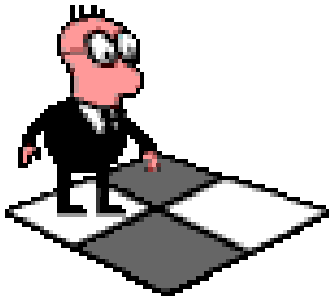
You and a friend are shopping at a factory outlet store that sells carpet remnants in various sizes. You are trying to find carpet squares for a playroom in your home. Your friend asks, "*What size room do you need to carpet?"* You respond, *"I have a room that can be carpeted with 1 ft, 2 ft., or 4 ft. carpet squares, but not 3 ft. or 5 ft.".* Your friend responds with a puzzled expression.

1. How can you explain to your friend how to find possible dimensions of the playroom that can be covered in carpet squares that are 1 ft., 2 ft., or 4 ft. but not 3 ft. or 5 ft.?

2. List ten possible (reasonable) room sizes. Use centimeter grid paper to show your friend how to "square off" the region with squares that meet the conditions of the problem.

3. Select one of the playroom dimensions and find the largest possible carpet square that could completely cover the floor with no gaps or overlaps.

Square Off!



A rectangular array can be used to find the *greatest common divisor* of two numbers using a procedure called "*square off*". This procedure involves marking off squares as shown in the diagram on Activity Sheet 2 and cutting off these squares until there is only one square left. The square described as an "*n unit*" square determines the *greatest common divisor* ***n*** of the two numbers that represent the dimensions of the given rectangle.

Use the model on Activity Sheet 2 and number concepts to explain the mathematics involved in this procedure.