Title: Dream Bedroom Floor Plan

(Key words: Scale drawing, proportion, and area) Summary – see objective below)

Existing knowledge: Students should be familiar with proportional and scale drawings. Student should have some basic knowledge of Cabri software to draw segments, measure segment lengths and also find area of specified areas. Extension activities involve creative and unique designs.

Materials: Computer with Cabri Geometry II software

NCTM Strands: Understand measurable attributes of objects and the units, systems and processes of measurement. Apply appropriate techniques, tools and formulas to determine measurements

Ohio Content Standards: (Measurement B, C, E) Convert units of length, area, volume, mass and time within the same measurement system. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders. Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature. (Geometry and Spatial Sense E) Use proportions to express relationships among corresponding parts of similar figures.

Introductions: Whole group discussion regarding the dream bedroom and what it might look like. Encourage all ideas. What unique things would you put in your bedroom if you were in control of the design? How big would your sleeping area be? What shape would your bed be? What would we find in your study area?

Objective: Using Cabri software the 7th grade math student will be able to design a bedroom that has a study area of not more than 40 square feet, a sleeping area that will accommodate a bed of twin size or greater, a chest of drawers, a closet and an adjoining bathroom with shower, toilet and sink. The bedroom may also have other activity areas if desired. The scale of 1 cm = 2 feet should be used in the Cabri drawing. The total area of the bedroom-study area should not be more than 300 square feet.

Assessment: Assessment types are left to the discretion of the instructor. Some suggestions would be: completed lab with diagrams and accurate measurements, student explanation of the lab and floor plan areas, processes used in the design and final project.

Help for turning on grid: Click on the button on the far right and select show axes. Click on this button again and select define grid. Then click on the coordinate (0,0) and the grid should appear. Next click on the button once more and select hide axes. Click again and select hide/show. The grid should appear very faint click once on one of the dots of the grid and the grid should be more visible.
Team Members’ Names: _________________________________________________________________

**Lab Goals:** Design your dream bedroom-study area within a 300 square feet area using the scale 1 cm = 2 feet.

**Construction:**

1. Decide on the dimensions of your room and open the software. Set up a page with the **grid** showing.

2. Using the **segments tool** begin construction of the floor plan of your room.

3. After designing the floor plan of your bedroom study area, give the dimensions of each of the following areas within your design using the **calculate tool**.

4. List dimensions below and also use the **label tool** to show them on your Cabri drawing.

   - Study Area _____ ft x _____ ft  Area = ________ sq. ft.
   - Sleeping area ______ ft x _____ ft  Area = ________ sq. ft.
   - Bathroom ______ ft x ______ ft  Area = ________ sq ft.

   Overall area of bedroom ______ sq ft.

5. Use the **comments** tool to label each area of your floor plan.

**Extension:** Design the outside walls of the bedroom-study area as an irregular shape and break the irregular shape into regular polygons, giving the areas of each. Do this using Cabri software and attach a copy to this lab. Here is a sample floor plan. (maximum area for extension plan is 300 ft.)

- shower = 3.5 cm x 3.0 cm = 7 feet x 6 feet = 42 sq feet
- sleeping area = 5.0 cm x 4.0 cm = 10 ft x 8 ft = 80 sq feet
- study area = 4.0 cm x 2.0 cm = 8 feet x 4 ft = 32 sq ft