**Week 23– Dream House Design Challenge**

**Unit:** Measurement and Geometry

**Grade:** Grade 9

**Curriculum Expectations**   
 **MFM 1P:** Solve problems that require maximizing the area of a rectangle for a fixed perimeter or minimizing the perimeter of a rectangle for a fixed area  
**MPM 1D**: Pose and solve problems involving maximization and minimization of measurements of geometric shapes and figures  
**SEL:** Work through challenging math problems, understanding that their resourcefulness in using various strategies to respond to stress is helping them build personal resilience

**Activity**1) You are the architect of your dream home, and you must design the layout of your 2-story house. It is up to you to design the house however you like.  
2) The problem is that each room has a set area as it must be able to fit all of your furniture, and you must design rooms that use the minimum perimeter for each given area. Using the chart below create a house layout the includes all of the rooms listed and meets the required areas. Your layout should include room names, wall dimensions, a staircase and the location of the doors for each room. You can include hallways and extra rooms as long as it is labelled on your layout.  
3) When you have finished designing both stories of the house, complete the chart by adding in the dimensions of each room.   
Note- Make sure that the total perimeters for each story of the house are the same so that they can fit on top of each other.  
Challenge- Start filling your house with some basic furniture. Using your computer pick out some items that you would like to add to your rooms. Include them in your layout to make sure that they can fit.

**Check for Understanding**   
I can determine the minimum perimeter of a rectangle with a given area.  
I can design a functional house layout that includes all of the rooms.

**Materials**   
Recording sheet attached below, pencil, pencil crayons or markers, and paper

**Dream House Design Challenge**

Floor 1

|  |  |  |  |
| --- | --- | --- | --- |
| Room | Area | Minimum Perimeter | Dimensions of the Room |
| Kitchen | 350 Square Feet |  |  |
| Living Room | 400 Square Feet |  |  |
| Bathroom | 48 Square Feet |  |  |
| Dining Room | 280 Square Feet |  |  |
| Laundry Room | 60 Square Feet |  |  |
| Pantry | 20 Square Feet |  |  |

Floor 2

|  |  |  |  |
| --- | --- | --- | --- |
| Room | Area | Minimum Perimeter | Dimensions of the Room |
| Bedroom 1 | 400 Square Feet |  |  |
| Bedroom 2 | 350 Square Feet |  |  |
| Bathroom | 48 Square Feet |  |  |
| Sitting Area | 60 Square Feet |  |  |
| Closet | 20 Square Feet |  |  |
| Movie Theater | 280 Square Feet |  |  |