

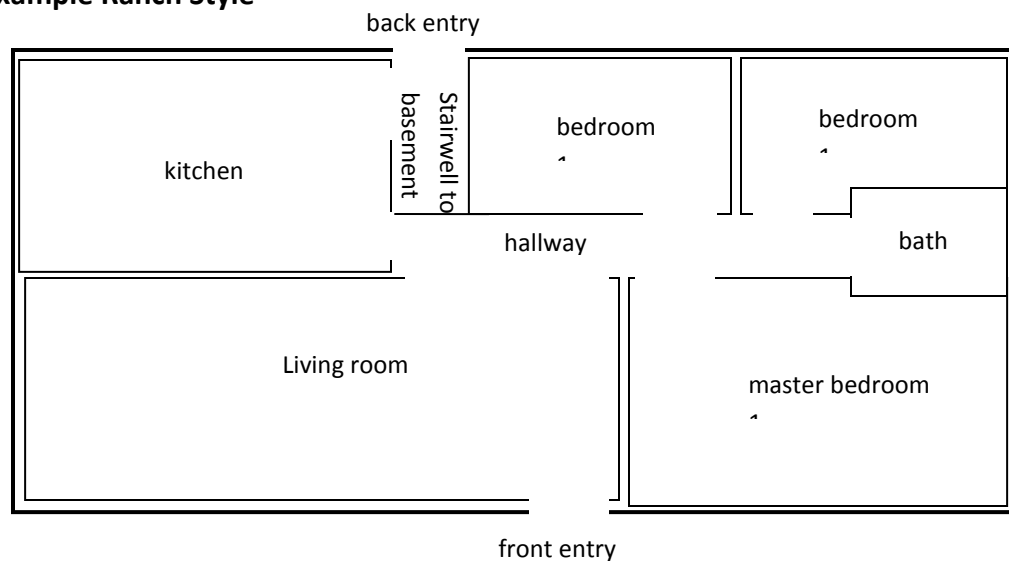
## Design Problem 2: Ventilation System

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Consider a 3 bedroom frame construction home with forced air heating and cooling. Design a ventilation system complete with blower. Remember to include the living room, bathroom and kitchen. You may also wish (your choice) to include a hallway and entryway.

Typical frame construction is done with 2" X 6" lumber on the outside walls and 2" X 4" lumber on the inside walls:

### Example Ranch Style



This means that ductwork will have to fit into these spaces. If you design a two story building you probably will need a air shaft or plenum (larger than 2" x 4") leading to the top floors.

The architecture is of your own making. You may wish to design a ranch style (single floor) dwelling or perhaps a two story home with bedrooms and bath on the upper floors. Include the dimensions of the home and of each room.

Calculate flow rates assuming you will need to consider a 20% air exchange every minute.

Calculate the total volume of a room (including height, usually 8 ft or 10 ft) and then calculate what airflow rate you will need to accomplish this requirement.

This assignment should require about eight hours including the report. Your report should have a title page, a short one paragraph summary (like the labs), drawings, and calculations. Do your own work (no teams on this assignment please). Late assignments will suffer a 10% penalty per day.