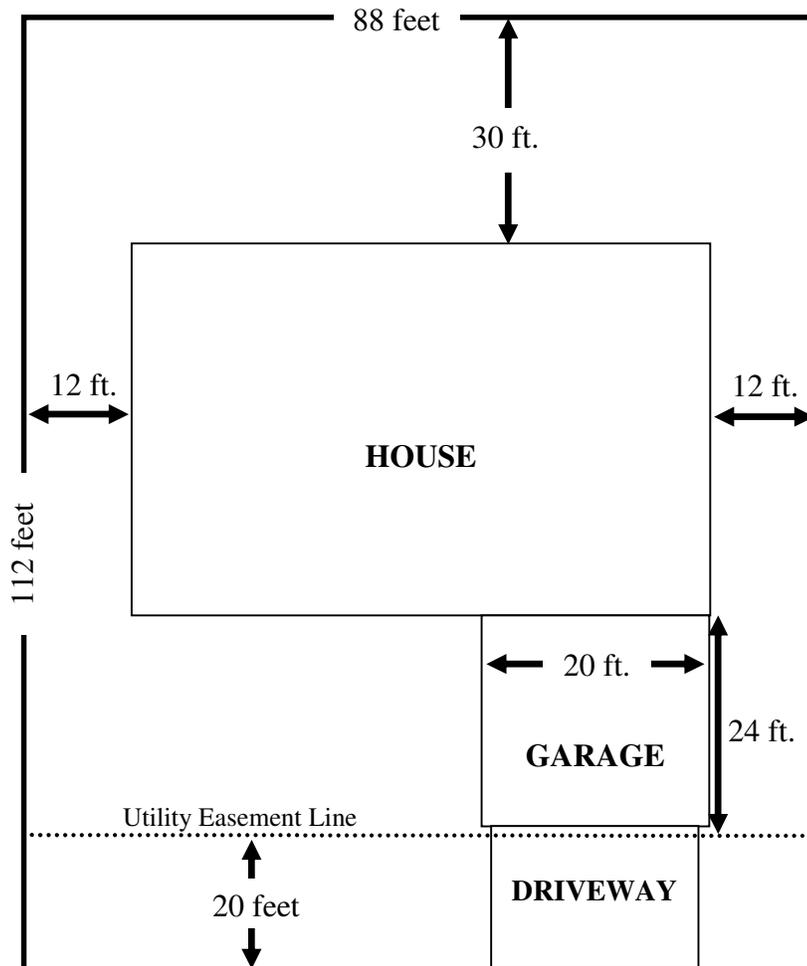Requirements for Final Project Design

- A single story house with:
  - 3 bedrooms (one of which is a master bedroom)
  - 2 full bathrooms and 1 half bath
  - 1 kitchen (with pantry), 1 dining room, and 1 living/family room
- Adequate closet space for a family of four. There should be a closet in all bedrooms as well as a coat closet near the front door and a linen closet near a bedroom.
- You must include a hot water heater (in the garage), washer, and dryer.
- The total construction cost for the house, land, garage and outside features must be under $325,000. The cost of the land is $20,000.
- The quality of construction to be used by the builder will cost $100 per square foot.
- All houses must fit on a building lot of 88 feet wide by 112 feet deep.
- All houses, not including the garage, must be between 2000 and 2600 square feet.
- There must be side yards that are a minimum of 12 feet on each side.
- The house must be set back from the front at least 20 feet.
- The house must have at least 30 feet of space for the backyard.
- You must use a standard, attached two-car garage that measures 20 feet by 24 feet. The cost per square foot of the garage is half that of the rest of the house.

**BUILDING
SITE
PLAN**

88 feet

30 ft.

12 ft.   12 ft.

HOUSE

112 feet

20 ft.

24 ft.

GARAGE

Utility Easement Line

20 feet

DRIVEWAY

ARCHITECTURE JOBS

Each team member should be the lead in one of the following three categories.

	Lead	Back-Up
Architect – Assumes the main role for drawing all house items on the graph paper. This person needs to be neat and precise. They must also listen to the inspector and contractor to make sure they follow the rules.		
Building Inspector – Assumes the main role for making sure all rules on these pages are followed at all times. This person must be able to remind his or her teammates of the rules and enforce the rules.		
Contractor – Assumes the main role of making sure room sizes are within range, completes the main inside cost page, and ensures that the team is staying under budget. This person must work with his or her teammates on designing rooms and features that meet cost guidelines.		

Each team member should be the lead in one of the following three categories.

Landscape Designer – Assumes the main role for drawing and coloring all outside items on the graph paper such as pools, trees, walkways, fences, and playgrounds.		
Real Estate Agent – Designs the home listing to sell your house. This role includes both math related items and the ability to write an informative, descriptive paragraph about your house.		
Graphics Designer – Designs the logo representing your company. This person must be good at art, have a creative mind, and be able to come up with a professional looking final product.		

You may select a lead for video or complete this as a team.

Video Supervisor (optional) – Leads the recording of a 60 second video highlighting your final project. This person must be good with the iPads and must plan a well-developed video of their home as if they were trying to sell it to potential buyers.		

FINAL PROJECT RULES & REGULATIONS

You may use a calculator at all times during the final project.
Use a ruler or a meter stick for all straight lines on this project.

Bubble Diagram Layout/Rough Copy

See Designing Your Rooms page for suggestions/requirements

Approval by teacher then pick up $20,000 poster board

Determine parts of poster board where you may not draw the house

See building site plan
Remember that you will be drawing wall thickness later and that will add half a block
Don't draw these lines of your paper, but remember not to go over these imaginary lines

Draw driveway and garage

Your driveway, at least 14 feet wide, can be on either the left or right side of the house.
Your garage must be the standard size listed
You are an **architect** completing this assignment. Neatness is extremely important.
Eventually you will draw a pathway/walkway from some point on the driveway leading to the front door.

Draw all other rooms [End of Day 1: A few rooms have been drawn]

Do not try to draw the outside of the house and then try to draw the rooms inside.
Start with rooms close to the garage and connect each new room to an existing room.
How big do we make each room?
- Example dimensions: Look at the dimensions you determined for your real home
- Minimum and maximum room sizes are listed on calculation pages

Draw lightly so that when you erase it won't leave much of a mark
A room's longest dimension should not be more than twice the other dimension
Write names lightly in the corner to keep track of rooms.
Make at least one room interesting – not the same old rectangle most rooms will be.
Front door faces towards the front (street) and back door faces towards the back.
All bedrooms are near bathrooms.
Very little hall space – Hall space is a **waste of money** that could be spent on rooms.
Any halls you do have should be 3 or 4 feet wide after wall thickness.
Make an initial estimate at least to determine that your house is under budget and within the correct size range.
Building codes are met.
The final house should be between 2000 and 2600 square feet (without the garage).

BUILDING CODES

1. No bathrooms may open to the kitchen.	5. Exterior doors must be at least 3 feet wide.
2. There must be at least two entrances to the house.	6. Closets must be at least 2 feet front to rear.
3. The toilet must have 8 inches of free space on each side and 24 inches of free space in front of it.	7. Bedrooms must have at least one window 3 feet by 4 feet or larger as a fire escape.
4. The following rooms must have a window: living room, dining room, all bedrooms, master bathroom.	8. Interior doors, except for closets, and openings should be at least 2 feet 6 inches wide.

9. Interior walls 2 feet or less do not need electrical outlets. Interior walls between 2 and 12 feet need one electrical outlet. Interior walls between 12 and 24 feet need two electrical outlets, and so on. Code requires only one outlet in the bathroom.

[End of Day 2]

Draw doors and eliminate walls (if necessary)

Use templates to draw all doors – **see teacher for directions**
Building codes specify the size of exterior and interior doors
Front door opens **into** the house and back door also opens **into** the house
Most doors open **into** the room in which you are going, except for closets
No doors to get into the kitchen, living room, dining room (just openings)
Doors required for bathrooms and bedrooms
See the Door and Window Example Schedule for labeling the dimensions of each door

[End of Day 3]

Draw wall thickness and windows – check examples

Exterior walls are 6 inches thick and interior walls can either be 4 or 6 inches thick.
Windows must meet building codes and their area must be 8-15% of the area of the house.
See the Door and Window Example Schedule for labeling the dimensions of each door

[End of Day 4]

Draw sinks, toilets, hot water heater, washer, dryer, kitchen appliances, etc.

Use templates to draw all items.
Toilets must meet building code.
All items have specific sizes – if you are not sure of the size ask your teacher or see previous years' examples
Hot water heater = 24" circle
Plenty of counter space in the kitchen in addition to the range, refrigerator, dishwasher, sink.
Fireplaces, if you want one, should be included in a common area (such as the living room).

[End of Day 5]

Draw outlets, lights, switches, etc.

Use templates to draw all items
Lights are circles on the templates (use "8" circle)
Outlet circle size is shown on the template
Electrical outlets must meet building code
Follow all electrical contractor rules (Architecture 7A) for outlets, lights, and switches
Fluorescent lights go in the garage and kitchen and they are 4 feet long
Lights are over the sink and the stove
Some appliances require special outlets (refrigerator, washer, dryer)
The vast majority of rooms **will only require one overhead light/fan**.

[End of Day 6]

Draw names on all rooms

All room names should face toward the street (small rooms may be written vertically)
All room names must be written neatly and in capital letters
All letters should be no more than one square high
One person should write all room names so that they look similar

List the dimensions of each room

List the width (across) first, then the length (up and down)
Example: 16 x 20 or 16^0 x 20^0
For rooms that are not perfect rectangles, use the dimensions for the majority of the room

Draw features outside the house

See Designing Your Landscape/Questionnaire/Outside Features page for choices

[End of Day 7]

Draw summary box (see example) – All caps and neat

The example below is of the architectural box which should be drawn near one corner of your design. This box should be drawn NEATLY (ruler) and all wording should be in capital letters. Have your north symbol point the direction you choose. Think about the sun rising in the east and which rooms will get sunlight at different times during the day.

[End of Day 8]

101 DRAGON DRIVE

MODERN DESIGN ARCHITECTS INCORPORATED
SARAH NICHOLS, MAEGHAN MCFARLAND, EMMA SMITH

BEDROOMS:	4
BATHROOMS:	3.5
LIVING AREA:	2,100 SQUARE FEET
GARAGE AREA:	480 SQUARE FEET
TOTAL AREA:	2,580 SQUARE FEET
TOTAL COST:	$279,000

SCALE: 0.25 INCHES = 1 FOOT

0 ft   3 ft   5 ft   10 ft

Completing recording sheets

All recording sheets should be completed in a neat and professional manner.

Inside area and cost calculations
Outside calculations
Landscape design recording page
Mortgage calculations
Energy/flooring/paint heating calculations

Final check of requirements page

Review this page to make sure all rules have been followed

Complete Home Listings Page & Design Company Logo & Complete Video

Complete home listing page on the computer or email your teacher the description
The company logo should follow guidelines on the logo page.
The logo must be hand drawn on a piece of computer paper.
The page should also include the entire company's name.
Complete Company logo recording page
The video should be between 60-120 seconds (see Video Recording page)

[End of Day 9]

Bad Home Layouts - How You Can Avoid Building a Home with a Bad Layout Design

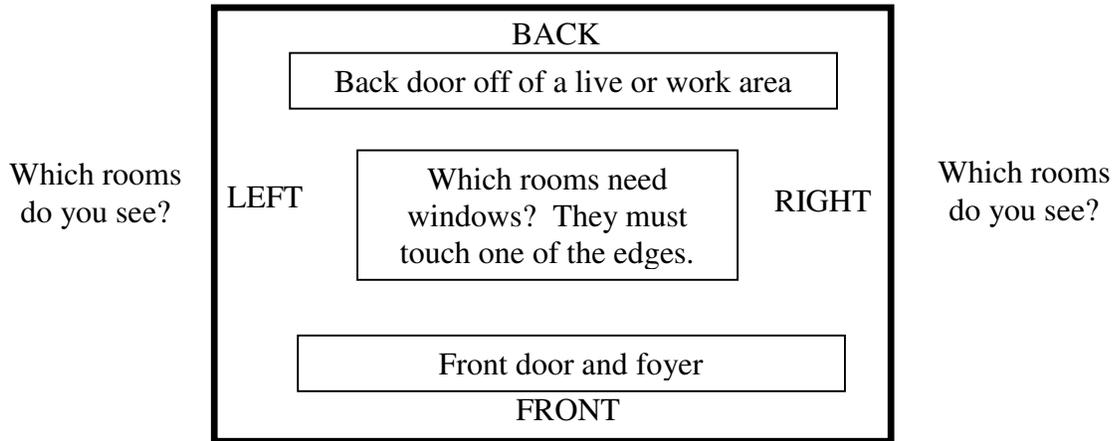## Home Layout Design & Flow Affects Resale Value

Common Bad Layout Designs - Here are a few of the common complaints we hear from buyers.

- **Hallway Facing the Entrance**
  Entrances are important because an entrance forms a first impression. Buyers make up their minds within 6 seconds of entering a home. It might not be a conscious decision, but buyers either feel good or feel bad walking in the door. Long, narrow, dark hallways are a huge turnoff, especially if the hallway constitutes the entire view from the entryway.

- **Dining Room in the Center**
  In this type of layout, upon entering the home, you walk through the living room into the dining room. To get to the kitchen, family room or bedrooms, one must walk through the dining room because all rooms are connected through multiple entrances to the dining room. It does not provide a straight path or easy access.

- **Adjoining Bedrooms**
  In some areas, appraisers won't consider the value of adjoining bedrooms, and will consider two bedrooms as one. Real estate ads might call this set-up a two- to three-bedroom home if two of the three bedrooms adjoin. Buyers expect a separate entrance to each bedroom.

- **Bedrooms Located Off the Living Room / Dining Room**
  It is undesirable to locate a bedroom door directly leading from a room where family members or guests gather. Apart from the noise factor, it reduces privacy as well. Nobody wants to look at a bed while dining. Most people want to dine, entertain family in the family room or greet visitors in the living room without a view of the bedroom.

- **Poorly Located Guest Bathroom**
  The only thing worse than staring down a long hallway upon entering a home is capturing a full view of a toilet at the end of it. Closing the door to the bathroom is unattractive and uninviting, so that's not a practical solution. A main-floor or guest bathroom, which is accessible only by walking through a utility / laundry room or bedroom, is unappealing as well.

- **No Views From One Room to Another**
  Even if your home is small, as long as one can see several other rooms from a central spot, it will make the home appear larger. Multiple doorways or arches to main meeting areas help to accomplish this purpose. Open spaces create a feeling of spaciousness. It's not necessary to open the kitchen to the living / family areas but it is popular.

- **Satellite Living Rooms**
  This type of layout generally places the living room off to one side of the entrance, and it connects to no other room but the entrance. People don't want to feel disconnected from the rest of the home, especially if they use the living room for the purpose it was intended. In new home construction, the trend is moving away from building homes with living rooms and replacing those areas with great rooms or expanded family rooms.

DESIGNING YOUR ROOMS

Think about what rooms you will see when you look at your house from each side.

Which rooms do you see?

```
                          BACK
        ┌─────────────────────────────────────────┐
        │   Back door off of a live or work area   │
        └─────────────────────────────────────────┘

                  ┌─────────────────────┐
 Which rooms      │  Which rooms need   │      Which rooms
 do you see?  LEFT│  windows?  They must │ RIGHT   do you see?
                  │  touch one of the    │
                  │  edges.              │
                  └─────────────────────┘

        ┌─────────────────────────────────────────┐
        │          Front door and foyer            │
        └─────────────────────────────────────────┘
                          FRONT
```

Which rooms do you see?

MUST HAVES and REQUIREMENTS

Room	Must have a window?	Where located in house
Master Bedroom	Yes	Back
Bedroom #2 and #3	Yes	Back, front, or side
Master Bathroom	Yes	Back, front, or side
Other Bathrooms	No	Anywhere
Kitchen	No	Anywhere*
Dining Room	Yes	Usually front
Living Room (Great Room)	Yes	Back

* Kitchen is often in the middle with a Nook or Breakfast Area nearby which contains a window

The kitchen, dining room, and living room need to be located close to each other. They often make a triangle. One needs to be able to go from the living room to the dining room without going through the kitchen.

Also needed: Laundry room, hot water heater (in garage), closet space (coat closet near front door), linen closet (near a bedroom), pantry (near kitchen), closets in bedrooms

Sleep, Live, Work
Think of your home as divided up into 3 separate areas: live, work, and sleep

Live: living, dining, family
Work: kitchen, pantry, workshop, study, half bath
Sleep: bedrooms, bath, storage, halls, utility

OFFICIAL RULES FOR ELECTRICAL OUTLETS

(Based on common building codes)

For most interior rooms

Interior walls 2 feet or less do not need electrical outlets.

Interior walls between 2 and 12 feet need one electrical outlet.

Interior walls between 12 and 24 feet need two electrical outlets, and so on.

For bathrooms

At least one electrical outlet shall be installed in bathrooms and it should be located within 36 inches of the sink. The outlet should be placed on a wall that is adjacent to the sink.

For outside

At least one electrical outlet shall be installed outdoors at the front and back of each house.

For laundry areas

At least one electrical outlet shall be installed to serve laundry appliances.

For garages

At least one electrical outlet shall be installed in each attached garage.

For hallways

Hallways of 10 feet or more in length shall have at least one electrical outlet. The hall length shall be considered the length measured along the center of the hall without passing through a doorway.

For closets

No outlets are needed in closets.

DESIGNING YOUR KITCHEN

The design of your kitchen is based on the three most important items in the kitchen: refrigerator, sink, and stove. These three form the "work triangle" and set the foundation for designing your kitchen. Here are the three most common examples of how to set your kitchen up.
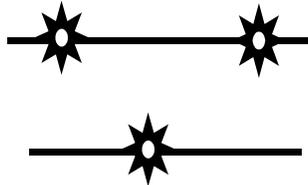
A U-shaped kitchen with the sink in the middle and the refrigerator and stove on opposite sides.
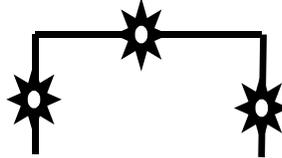
An L-shaped kitchen has two of the three on the same wall and one on a second wall.
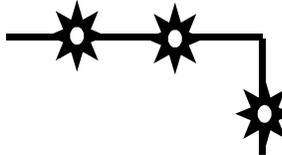
A parallel kitchen has two counters opposite each other.

Kitchen Design Details

Sink: You need 2 feet of work area on both sides of the sink.

Stove: You need 1.5 feet of work area on either side of the stove and 3.5 feet of open space in front of the stove.

Refrigerator: You need 1.25 feet of counter space on an open side.

Dishwasher: You need 3.5 feet of open space in front of the dishwasher.

A pantry is for storage off of the kitchen.

Be sure to include plenty of counter space in the kitchen.