THE ARCHITECTURE HANDBOOK:
A Student Guide to Understanding Buildings

TEACHER EDITION

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1 How do you read a floor plan?

2 How are the rooms of the F10 House arranged?

Floor plans are drawings of buildings with the roof removed as seen from above. They are extremely useful drawings that help explain how the rooms are arranged, although no one will ever see a building through its floor plan.

To imagine what the floor plan looks like, architects slice an imaginary horizontal line, called the cutting plane or cutting plane line, about 4 feet above the floor. Everything below the cutting plane is seen in the floor plan, and some important objects above the cutting plane (such as a closet shelf) are shown with dashed lines. A floor plan drawing uses orthographic projection, which means the 3-dimensional object (the building) is “flattened” and shown on paper.
Several symbols appear on floor plan drawings to help coordinate the floor plan with the other drawings within the set of building plans or prints. An **exterior or interior elevation symbol**—indicated by a circle tucked inside a triangle—provides a reference to the page number and drawing number of the exterior or interior elevation drawing. (See Project 4 for more information.) A **building section symbol** is a similar circle inside a triangle, but it has a line extending from it which ends in an ‘L’ shape. Building section symbols show the cutting plane line of the section drawings. (See Project 5 for more information.)

Architects use different methods—both written and graphic—to put their ideas on paper. To start the process of designing a building, architects work closely with the owner to develop a detailed **program** which lists all the requirements needed in the building. Architects then sketch circles (or “bubbles”) to represent various spaces in a building that will meet the needs listed in the program. These **bubble diagrams** are intended for the architect as they think through their design. The bubble diagramming process helps to get all their creative ideas down on paper, without worrying yet about what the final design might be. This process can be thought of as the architectural equivalent of outlining an essay or a story you might do in a writing class.

**CHAPTER VOCABULARY**

- **Floor plan** a drawing of a building with the roof removed as seen from above
- **Cutting plane / Cutting plane line** the imaginary line or slice on a floor plan drawing showing where a building is “cut”; typically about 4 feet above the floor; everything below the cutting plane appears in the floor plan
- **Orthographic projection** (also called orthogonal projection) a general term to refer to a method of drawing where a 3-dimensional object is “flattened” and projected, or shown, on a 2-dimensional piece of paper
- **Plans / Prints** pages of drawings of the building; (because architects no longer reproduce drawings by the method that creates blue sheets, the term “blueprints” is no longer common)
- **Exterior or interior elevation symbol** a small round symbol, indicated by a circle tucked inside a triangle on the floor plan. It has a line extending from it which ends in an ‘L’ shape. It gives the page number and drawing number for the exterior or interior elevation drawing within the set of drawings.
- **Building section symbol** the small symbol—indicated by a circle tucked inside a triangle—on the floor plan that gives the page number and drawing number for a particular section drawing within the set of drawings
- **Program** a detailed list of needs that must be fulfilled by the building’s final design

CONTINUED ON NEXT PAGE
bubble diagram / bubble diagramming
A simple diagram of rooms shaped like circles, not necessarily drawn to a specific scale; used by architects for understanding the relationships between rooms.

function / use
A description of how the building, space, or room is used.

schematic design drawing
A drawing produced later in the design process that more fully explains the architectural design to show the general relationships and space requirements of the project; this drawing may be shown to the client to illustrate the design ideas that the architect is thinking about; it does not typically include dimensions or other construction-related notes.

construction drawing
A very accurate drawing that shows the design, location, and dimensions of all the parts of the building; a construction drawing is produced by the architect; its purpose is to give the contractor all the information needed to construct the building.

Chicago bungalow
A 1 1/2 story, long and narrow, brick home with a porch, constructed in the Chicago area between 1911 and 1939; today more than 80,000 bungalows make up a third of the city's single family detached homes; the word "bungalow" comes from the Hindi word bangla, describing a low one-story house with a porch; many different Chicago architects designed bungalows.

These vocabulary words define the terms, features, and rooms that appear in the F10 House floor plan drawings—A.03, A.04, and A.05.

interior door
A door that connects two rooms or spaces.

Each bubble can represent one use or one room, or it may represent several functions. Bubble diagrams help architects visualize how the spaces are organized and which spaces are adjacent to each other. At this point of the design process, architects aren't especially concerned about the exact sizes of spaces. Instead, the architects are thinking about the overall building and proportion of spaces within that building. To some extent, they are also thinking about the shape of the spaces. Will the room be long and narrow to connect two other spaces?

Will the space be organized along a circulation route? Or, will the space be self-contained and tucked into a corner? The bubble diagrams help an architect sort through these ideas.

A bubble diagram can also include arrows and labels. Each bubble is labeled with the function that will take place within that space. Handwritten notes on the bubble diagrams help an architect remember features to be included later. For instance, an architect might note something such as "large windows to face east" or

CONTINUED ON NEXT PAGE
“change from carpet to wood floors here.” Bubble diagrams are usually drawn on tracing paper so they can be used as overlays to rearrange the spaces and to compare various schemes.

After the architect is comfortable with the bubble diagrams and the way the spaces are organized, they convert the diagram into a true floor plan, drawn at a specific scale. A schematic design drawing is often created for the client to see what the architect is envisioning. It may show furniture to help the client understand the size and shape of the rooms.

Finally, the last type of drawing – a construction drawing – is created for the people who will construct the building. A construction drawing has many details, including specific dimensions and notes about materials, door types, and window types. Objects such as doors, sinks, and toilets that are fixed elements of the home also appear on construction drawings.

- **exterior door** a door that connects a room in a home to the outside
- **vestibule** an entry hall
- **stair landing** the wider platform between two flights or levels of stairs; often the landing may be where the stairs change direction
- **tread** the horizontal part of the stair where your foot steps
- **riser** the vertical part of the stair spanning between the treads where your toe “kicks”
- **open to below** an architectural term used to describe an upper floor space with a railing around an opening where you can look down into the room or space below
- **bottle wall** a unique feature of the F10 House; the stairwell wall is lined with sealed plastic bottles filled with water and mounted onto the wall with standard metal bottle holders typically used on bicycles; the windows at the top of the stairwell allow low angled winter sunlight to come in; the water in the bottles absorbs heat during the day, then releases it in the early evening when the air temperature drops, to help heat the home
- **powder room** a small bathroom that has only a sink and toilet; often located on the first floor of a home
- **unfinished (basement)** a term used to describe a room that has only the rough structural materials in place; a room might be ‘unfinished’ because the room hasn’t been painted, the floor isn’t yet covered with carpet or tile, or the light fixtures have not yet been installed
- **EXPO** abbreviation for exposed; the wooden structure in the ceiling of the room (the underside of the floor above) can still be seen because it hasn’t been covered up yet
- **range** a cooking appliance that has an oven and stove
This chapter compares the F10 House with a Chicago bungalow. Although both homes are long and narrow structures on tight urban lots, their floor plans reveal how the rooms in each building are arranged in very different ways.

In Chicago, the bungalow is the most common single-family type of housing. Other cities also often have a type of housing that is quite common throughout the region. The exterior details of homes typically found in your community might be slightly different, yet have floor plans that are quite similar.

Powder your what?! 

The term “powder room” was originally used in the 1700s to describe a small room or closet where a man or woman would go to comb, adjust, and add more white powder to their wig. (Think of George Washington or Marie Antoinette and their white wigs.) Homes of wealthier people or public buildings would even have a wig attendant waiting there to help you. Today, the meaning of this room has changed dramatically. It now refers to a small additional residential bathroom, often located near the living room, which contains only a sink and toilet.

DID YOU know?

Floor plan arrangements in homes are often influenced by the lot size and shape that is typical in your community. On your way home today, can you determine whether most of the floor plans in single-family homes in your neighborhood are laid out in an overall square or in a rectangular shape? If they are rectangular, does the long side or the short side of the rectangle face towards the street?
in class

Sketching and comparing bubble diagrams

After you’ve sketched a bubble diagram of your own home, try sketching bubble diagrams of the F10 House and a Chicago bungalow. Compare all three homes. Although the F10 House and the Chicago bungalow sit on lots of similar size and shape, you’ll be surprised to discover their room arrangements are much different. How is the floor plan of your home similar or different? Your teacher has the complete set of drawings and images for this in-class activity.

CHAPTER RESOURCES


Above: A Chicago family in 1924 with their new bungalow being constructed in the background.

Right: A construction worker lays bricks in 1924 for a new Chicago bungalow.

The interior of a Chicago bungalow
COMPARISONS planning spaces

<table>
<thead>
<tr>
<th>Planning Spaces</th>
<th>F10 House</th>
<th>Chicago Bungalow</th>
<th>MY HOME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td>2000</td>
<td>1920s</td>
<td></td>
</tr>
<tr>
<td><strong>Lot size</strong></td>
<td>25' wide x 125' long</td>
<td>25' wide x 125' long</td>
<td></td>
</tr>
<tr>
<td><strong>Square footage</strong></td>
<td>1,837 sq. feet (full basement, first and second floors)</td>
<td>approximately 3,800 sq. feet (full basement, first floor, and second floor with low sloped ceilings)</td>
<td></td>
</tr>
<tr>
<td><strong>Relationship of building to street</strong></td>
<td>home sits perpendicular to the street</td>
<td>home sits perpendicular to the street</td>
<td></td>
</tr>
<tr>
<td><strong>Overall floor plan shape</strong></td>
<td>long and narrow</td>
<td>long and narrow</td>
<td></td>
</tr>
<tr>
<td><strong>Arrangement of rooms</strong></td>
<td>living room faces the street; kitchen faces the alley in back; bedrooms on second floor</td>
<td>living room faces the street; kitchen faces the alley in back; bedrooms separated from guest spaces by a wall that bisects the house front to back</td>
<td></td>
</tr>
<tr>
<td><strong>Division of rooms</strong></td>
<td>first floor rooms are primarily organized in one large area with few doors or walls dividing up the space</td>
<td>first floor rooms are clearly defined by doors and walls</td>
<td></td>
</tr>
<tr>
<td><strong>First floor rooms</strong></td>
<td>living room, dining room, kitchen, powder room</td>
<td>living room, dining room, kitchen, bathroom, two or three bedrooms</td>
<td></td>
</tr>
<tr>
<td><strong>Second floor rooms</strong></td>
<td>three bedrooms, bathroom</td>
<td>an extra space with a low sloping ceiling; one family might use it for storage or another bedroom, while another uses it as recreation space</td>
<td></td>
</tr>
<tr>
<td><strong>Basement rooms</strong></td>
<td>storage, laundry</td>
<td>storage, laundry</td>
<td></td>
</tr>
</tbody>
</table>

TALK about it

- How are each of the spaces in the F10 House used?
- Do some spaces have more than one function? Which ones?
- Are there any spaces where the use isn’t clearly defined?
- Which rooms connect to one another?
- Does a door separate the connecting rooms, or do the rooms flow right into one another?
- Which rooms don’t connect to one another? Why not?
- Which rooms are long and narrow?
- Which rooms have a square shape?
- Are some of the rooms organized along a circulation path?
- What are some similarities and differences between the floor plans of the F10 House and the Chicago Bungalow?
**Try It!**

**SKETCH BUBBLE DIAGRAMS OF YOUR OWN HOME**

**TRY IT! STEPS**

1. Think about how the rooms are laid out in your home. Overall, is your home long and narrow or shaped more like a square?

2. Using the entire sheet of blank paper, sketch a bubble diagram of one floor of your home. In your diagram, each bubble you sketch should:
   - represent a different room or space
   - be drawn quickly in a smooth freehand motion
   - be roughly oval in shape
   - touch another bubble at an edge, to show adjacent rooms

   Don’t worry too much about the exact sizes of these bubbles, but you should pay attention to the proportion of each bubble (space) and how it fits into the overall building. Is each space long and narrow or more square-like?

3. Label each bubble with the name of the room or space. If more than one activity happens in a single space, make a note of that.

4. If your home has more than one floor, sketch another bubble diagram on a second sheet of paper.

![A student’s bubble diagram of their home](image1)

![A student’s bubble diagram of their home](image2)

**WHAT YOU NEED**

- 8-⅝” × 11” sheet of blank paper
- pencil, pen, or a black marker