

# 6

## **MICROSCALE BUILDING: MORE THAN MEETS THE EYE**

In the last chapter, I showed you several *macroscale* building techniques; there you learned to make models much larger than the objects they represent. This chapter focuses on the opposite technique, something called *microscale* building. As the word *micro* indicates, this scale is very small. Keep reading to find out just how small. If you are someone with a limited supply of LEGO bricks, or perhaps you do your building in a confined space, then the microscale route might work well for you. You can still create interesting models no matter how limited your palette of pieces might be.

Figure 6-1 shows an example of the type of subject matter you might explore when building at this scale.

Though only 7 inches long, this microscale cargo ship captures many of the details of the real thing, including shipping containers, the bridge, and the always necessary smokestack.

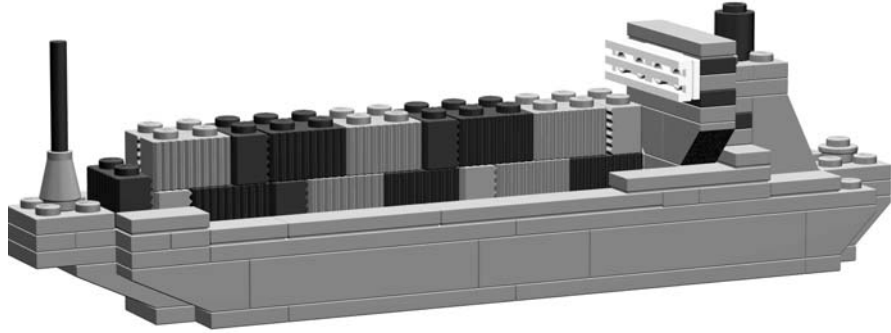


Figure 6-1: Microscale works well when the real life inspiration is huge.

Now that you know that *micro* is yet another scale at which you can build models, you probably want to know how to define micro. How small is small? Let's back up a couple chapters and think about the train station (shown in Figure 3-4).

In Chapter 3, I showed you how to build the walls, doors, and windows of that building to accommodate the standard-sized LEGO minifigs. However, suppose you wanted to build the train station smaller, maybe only one-half or even one-third the size. In such a case, the features of the building would no longer be properly sized for minifigs. What label then would you apply to the scale of the building? In a word: *micro*. In this book, the term *micro* or *microscale* applies to models of objects that are built much smaller than is suitable for minifigs to live or travel in.

So far in this book, I've talked about several different scales to which you can build models. To put them all in perspective, take a look at Table 6-1, which describes each one.

**Table 6-1:** Comparison of Various Scales Used to Build LEGO Models, from Largest to Smallest

Scale	Description
Macro	Discussed in Chapter 5. When you are working at this scale, the model ends up being many times larger than the original object.
Lifesize	As the name suggests, models you create at this scale will be exactly the same size as the original object. These could be sculptures (as seen in Chapter 7) or just about any faithful reproduction of a real life object.
Miniland	Models and figures built to miniland scale are roughly twice the size of minifig scale constructions. This is the scale used to create the miniland displays at the LEGO theme parks.
Minifig	The train station we built in Chapter 3 was created at minifig scale. Buildings, cars, and other objects are all built in proportion to the minifig characters.
Micro	I'll show you microscale in this chapter. The models built this way are typically even smaller than those built using the minifig scale.

**NOTE** *In order to standardize microscale building for the purposes of group displays, some LEGO builders have decided to use a 1×1 cylinder brick to represent the size of a person within the microsized world. In other words, in such cases, one brick in model height is equal to roughly 6 feet in the real world. This should give you a good idea of the scale of the micro world.*

Of course, there are any number of scales upon which you can base your models. For instance, you may decide to build a 1:3 replica of the grandfather clock that sits in your living room. That certainly wouldn't be minifig scale. The model isn't larger than the original, so you know it's not macro. In fact, it really doesn't match any of the major scales noted above. That's okay. The scales I laid out in Table 6-1 are just guidelines, not rules.

These scales are, however, useful if you want to understand the scale at which you are making your models. For instance, suppose you are building a model that you want to display alongside one built by a friend or a member of the LEGO builders group to which you belong. If you both (or all) agree to build something to minifig scale, you each know what that means. The minifig label provides a reference to a particular size of building. That way you don't arrive with a 1-foot-tall warehouse that's supposed to go next to your friend's 3-foot-tall ice cream stand. That could be embarrassing!

## Microscale: Small Scale with Big Possibilities

When we looked at minifigs back in Chapter 3, I helped you figure out that structures or vehicles intended for those little folks should be built to about 1:48 scale. However, microscale models aren't locked into one set of numbers, much like the macroscale bricks back in Chapter 5 that weren't all built to the same scale. For example, a 1-foot-tall model of the Empire State Building in New York would be approximately 1:1250 scale, because the actual building is 1,250 feet tall. On the other hand, a 1-foot-tall model of the Great Pyramid in Egypt would be approximately 1:480, because the actual pyramid is about 480 feet tall.

This might seem a bit confusing because earlier I mentioned that some builders use a 1×1 cylinder brick to represent the height of a microscale person. The examples of the Empire State Building and the Great Pyramid are obviously not built to the same 1-brick-equals-6-feet specification. In fact, they aren't even built to the same scale as each other! But they are microscale examples nonetheless. These examples demonstrate that the actual scale can vary within the micro world, but models still hold to the same principle; they are extremely small versions of very large things. Just as you did in Chapter 5, where you learned to build 4X and 10X versions of the same brick, you can use different numbers to achieve the dimensions for a microscale model.

It's also worth noting that neither of these two models would be classified as minifig scale since even minifigs would look like giants next to the LEGO version of either structure. Instead, both of these models are definitely considered microscale for the reasons I've already mentioned.

## Getting Started: Ignore the Details

Okay, you don't really want to throw out every detail, but many smaller features on large objects are just not going to be included in your final work. In Chapter 5, I talked about a technique called *approximation*. This is the building method where you try to give things the look and feel of their real life counterpart without necessarily duplicating every last detail.

That same principle can also be applied to microscale models. The easiest way to do this is simply to look at the thing you are modeling and try to see only the characteristics that stand out the most. How does that work? To find out, let's go back to the Empire State Building as an example of how to create a model at this scale. If you tried to create a minifig-scale version of that building, it would still have to be more than 26 feet tall! Remember that in Chapter 3 you discovered that minifig scale is about 1:48. Because the real building is 1,250 feet tall, you would divide that number by 48 and end up with 26.04 feet as the height of your model.

Most people don't have enough LEGO bricks to tackle a project of that size. A microscale version of such a large building makes much more sense. But in choosing microscale, you need to recognize that smaller details such as window sills, decorative statues, or signs may have to be left out so that you can capture the essence of the building in something less than 26 feet.

The Empire State Building has a unique shape that is easily recognized. Bringing it to life in microscale involves trying to re-create that shape with as few elements as possible. All you are trying to achieve is the *feeling* that your model is this building not that it is an exact replica.

Start by sketching the shape of the building on some graph paper.

**NOTE** *For this next example, I've used one of the model Design Grids. This is special graph paper that has lines drawn to the same size and shape as real LEGO elements. Refer to Appendix B of this book for more information on the Design Grids. For now, just follow along with the example shown here.*

I found some images of the actual building on the Internet and used them to come up with the drawing you see in Figure 6-2.

Notice that I've only drawn the outline of the building in this first illustration. The silhouette is the most important thing I want to achieve in making this model. As previously noted, I've essentially left out all the details at this point. Seeing only the shape of your subject helps you see the big picture of the model you are attempting to produce. Because microscale building is often about creating the illusion of a larger object, it's very important that the model look right at first glance.

How did I know how big to draw it? I didn't. I just guessed, though I obviously wanted to make it fit on a single page or less. You may find that your first few drawings are too large or too small or that they don't capture the profile the way you want. Don't give up. Making a second or third sketch doesn't take that long, and your plan will likely improve each time. Note that at this point, I'm not even worrying about designing to a particular scale, I'm just focusing on finding a design that captures my subject.

Next, I begin to add the major details.

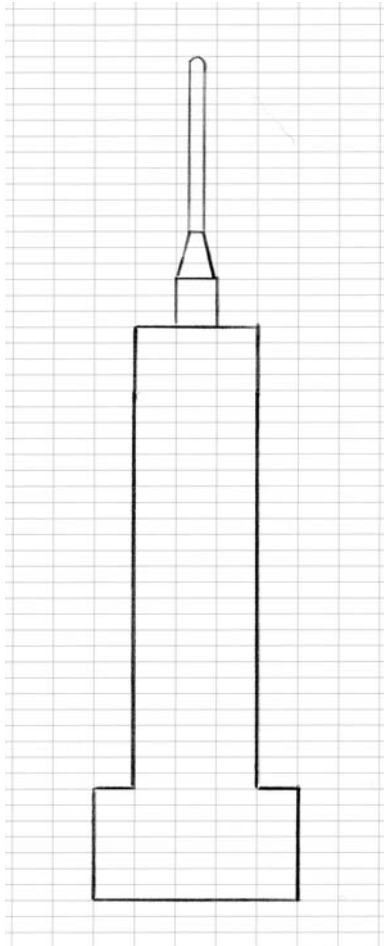


Figure 6-2: A rough outline of the building

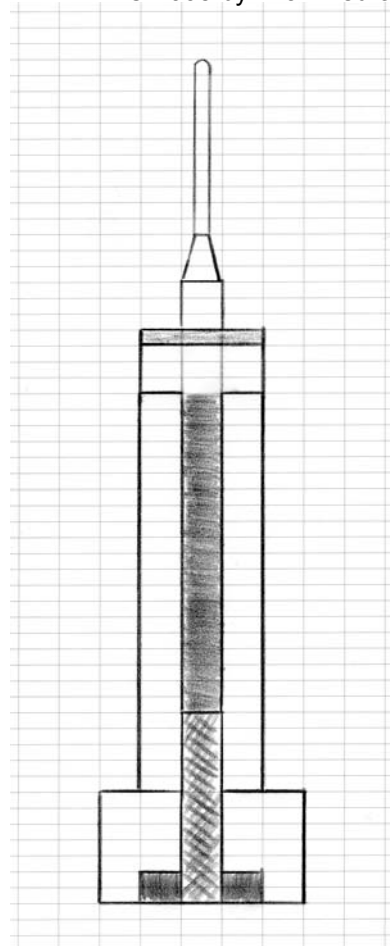


Figure 6-3: I've sketched in the main features of the building.

As you can see in Figure 6-3, I've drawn in the main entrance, shaded an indent near the top of the tower, and added the shape of the channel that runs vertically up the center of the building. Notice that in this drawing, I've tried to use different shades of pencil to represent different parts of the building. In some cases, this is to remind myself that even though this is a two-dimensional drawing, it is the plan for a three-dimensional model. By shading some areas darker, I'm leaving a visual clue for myself that these will be closer to the back of the model rather than right up front. The center channel, which runs most of the height of the building, is a perfect example of this technique. It is recessed from the face of the famous skyscraper, and I want to try and duplicate that look if I can.

It's also worth pointing out that I'm not being too careful with how my lines meet or how each area is colored in. This is just a sketch and isn't meant to be perfect. Perfection is boring; have fun with your design sessions!

Lastly (as shown in Figure 6-4), I've added some boxes to represent the windows. The key word in this last sentence is *represent*. As noted above, microscale models will never capture every last detail and often, with a very large subject, we can't even depict things as large as windows. You can, however, add some plates of a different color to give the sense of where windows are located.

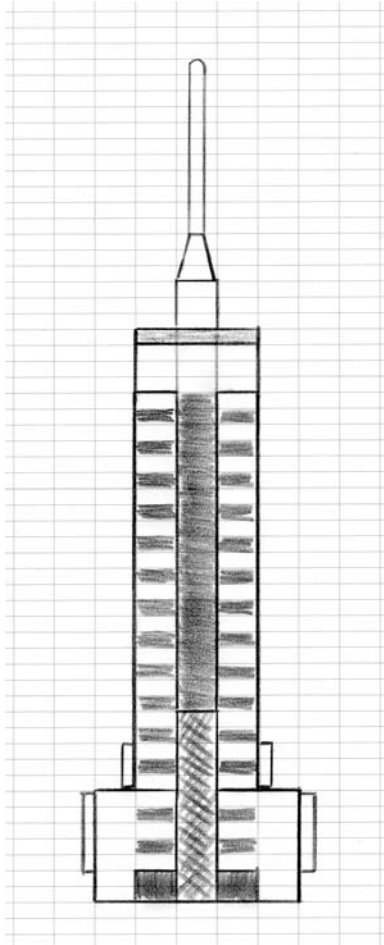


Figure 6-4: The blueprint for my micro marvel

Interestingly, this is one model that really does look good in light and dark gray. Although many of the ideas presented in this book would benefit from a splash of color, this model is one that doesn't. The simple two-tone effect, offered by the two shades of gray, is exactly what I'm looking for.

## Translating Ideas into Bricks

Now I have a plan. How does this become a LEGO model? Look at the drawing I've made and remember that the main idea of microscale building is to make something as small as possible and yet have it remain recognizable. Keep in mind that each of the boxes (or cells) on the design grid is the same height as a standard 1×1 plate. Therefore three cells equal the same height as a standard 1×1 brick (see Figure 6-5).

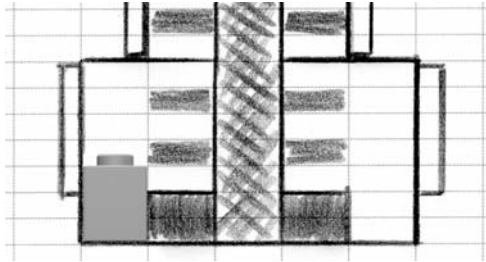


Figure 6-5: A portion of the blueprint showing how a 1×1 brick compares to the design I've laid out

To my eye, the bottom left and right corners of my sketch (shown in Figure 6-5) look very much like 1×1 LEGO bricks. Based on that assumption, I can quickly figure out what bricks and plates might work best to construct the rest of the building. In Figure 6-6, I added in some light and dark gray plates to suggest what elements I will use to build the real model.

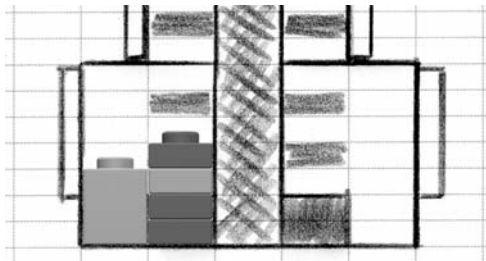
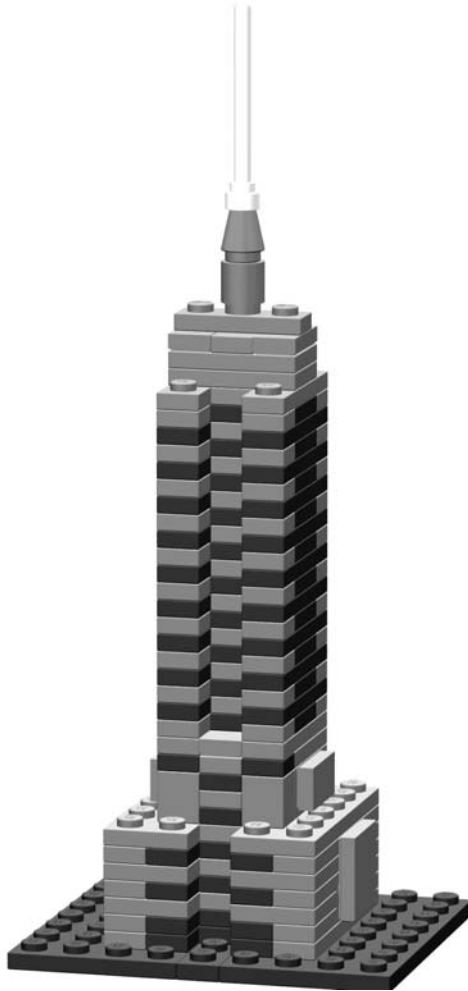


Figure 6-6: A more direct comparison between actual elements and the partial plan for the model

Although these may not be the exact pieces I end up using, they give me a sense of what *types* of elements I'll need.

You can see (in Figure 6-6) that I have only represented some of the windows and even then, they are only represented by dark gray plates that I intended to give the feel of windows. As I continue to match the sketch with appropriate sized elements (based on the 1×1's I started with) it doesn't take long for a little building like this to come together as the finished model you see in Figure 6-7.



*Figure 6-7: Real life brought down to size—micro size!*

In the final version, I've included a foundation made from standard plates, though how you choose to do this (in your own version) is entirely up to you. For instance, if you were using this building as part of a larger micro-scale exhibit, you might need it to sit on something different—perhaps a waffled baseplate.

You'll find that if you look carefully at this model, you can see that it's constructed almost entirely of plates. Not every micro model will be like this but, in many cases, the smaller size of plates offers you greater creative control over your work. Of course, you may not have the right number of light and dark gray plates to make this exact replica of the Empire State Building, but don't let that stop you from making one anyway. Try building one from just bricks to see if you can match the shape. Or try using other colors to come up with your own version. You could use white, tan, or even



yellow bricks and plates to make something that at least resembles this famous landmark. Remember that was the goal—to make something that resembled this building but didn't necessarily duplicate every last detail.

**NOTE** *You can find complete instructions for both the cargo ship in Figure 6-1 and the Empire State Building in Figure 6-7 at [www.apotome.com/instructions.html](http://www.apotome.com/instructions.html).*

### ***Recap the Technique***

You've now seen that building microscale models is as easy as following three simple steps:

1. **Sketch out the edges.** Identify the outline of the object you're building, ignore any other details. This gives you the essential shape to use as a starting point.
2. **Find the features.** Look for major features, especially interesting shapes or patterns that help define the basic look of the object.
3. **Discover the details.** Pick some of the smaller details to model. Be careful to select only things that are critical to the overall feel of the object.

It's not really necessary to use paper and pencil to work out the design of your model, though you may find it very useful. Sometimes part of the fun is just digging through your LEGO bricks and working through the steps with the real elements in your hands. You can simply take apart mistakes and rebuild that portion. Some mistakes become happy accidents that end up being better solutions than the ones you originally had in mind. Either way, the benefit is that you are thinking in three dimensions and solving problems as you go.

## **How Do I Know What Scale I'm Using?**

There are two ways to determine the scale of your micro model:

1. Decide on a scale *before* you begin building.
2. Figure out the scale *after* you're done building.

Let's look at each method separately.

### ***Decide on a scale before you begin building.***

Pretend for the moment that you're building a model to go along with something a friend is building. Perhaps you're putting together a microscale town. The two of you agree to a scale of about 1:100. This ensures that no matter what subject matter you use for inspiration (real buildings, photos, drawings, and so on), the structures you build will have similar proportions.

**NOTE** *Picking a scale for a project like this is really arbitrary. You want to select a scale with a fairly large difference between the two numbers. In this example, you've picked 1:100, but you might also find success with other scales. If you're both building gigantic skyscrapers for a microscale city, you might want to build at an even smaller scale like 1:200 or 1:300. Remember, the bigger the second number is, the smaller the model will actually be.*

Deciding upon a scale prior to building means that you will use the scale factor to know how big your model should be. For example, a real life 100-foot tall water tower would become just over a foot tall when built as a 1:100 scale LEGO model. A 25-foot corner store would be only 3 inches tall when modeled in LEGO bricks. Put together on a table, these two models would look as though they belonged to the same scene. Building to a specific scale helps you make sure such elements look right together.

### ***Figure out the scale after you're done building.***

The second method, for determining scale, works exactly opposite to what I've just described. I used the second technique for the earlier Empire State Building example. I decided on the overall shape of my structure and then found LEGO elements that matched a particular part of it. Then I decided what other pieces to use based on how big they needed to be compared to those first parts I picked out. In the end, my model was about 7 inches high. Because I know that the real structure is 1,250 feet tall, I can figure out the scale using some more simple math:

$$1250 \times 12 = 15000$$

(This converts the building's height from feet into inches, since I used inches to measure my model.)

$$15000 \div 7 = 2143$$

(This divides the real height by the height of my model. The result is my scale factor.)

It's easy to see that the Empire State Building I described above was built to a scale of 1:2143. Now that's micro!

## **Replacing Full-Size Parts with Microscale Stand-Ins**

In many ways, microscale building is just as challenging as any other scale. You are forced to make decisions about which parts to use in what situations. Often, you might know that a particular LEGO piece exists, but you can't use it since it's much too big for this scale. Let's look at two different classes of parts (wheels and windows) and see how you can simulate them at microscale without using elements actually designed to fill those rolls.

## **Microscale Wheels**

Take, for example, most of the LEGO wheels. Many are the appropriate size for minifig or miniland scale, but they are much too large to be used as wheels for vehicles built to microscale. That doesn't mean they can't be used to represent something else, but you probably won't use them as wheels. Instead you may find yourself using 1×1 cylinder plates turned so that they are sitting on edge (see Figure 6-8).

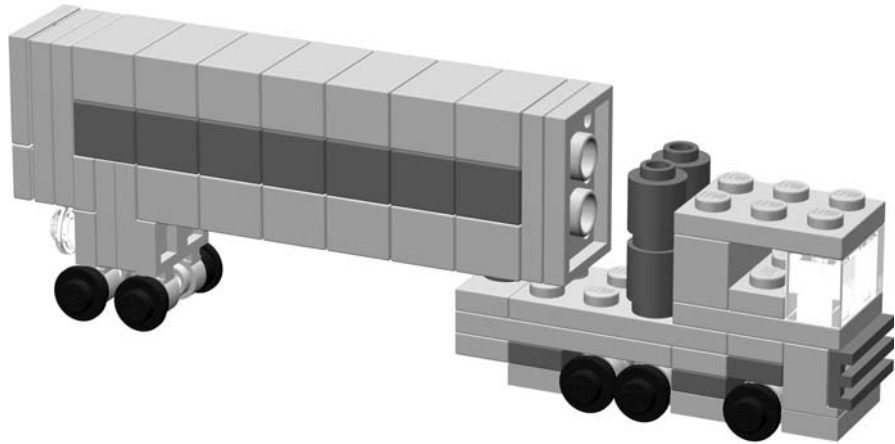


Figure 6-8: Simple microscale truck with 1×1 cylindrical plates for wheels

The transport truck shown in Figure 6-8 gives you an idea not only for microscale wheels, but also provides an example of how to turn bricks on their sides to create certain shapes or patterns.

The trailer portion of the truck is created by stacking 1×2 bricks on top of each other. Those stacks are then sandwiched between 2×3 plates. The entire trailer section is then turned so that the studs are facing to the back of the vehicle.

**NOTE** For complete instructions on building the transport truck, please visit [www.apotome.com/instructions.html](http://www.apotome.com/instructions.html).

## **Microscale Windows**

As with the wheels, many of the actual LEGO window elements will not look right when you use them as windows for buildings at this scale. You can use plates as I did in the Empire State Building earlier in this chapter, however. Or, for models based on smaller buildings, you can use something like the 1×1 headlight brick with its side stud facing inward. Several of them, when grouped together, create the impression of a picture window for the house shown in Figure 6-9.

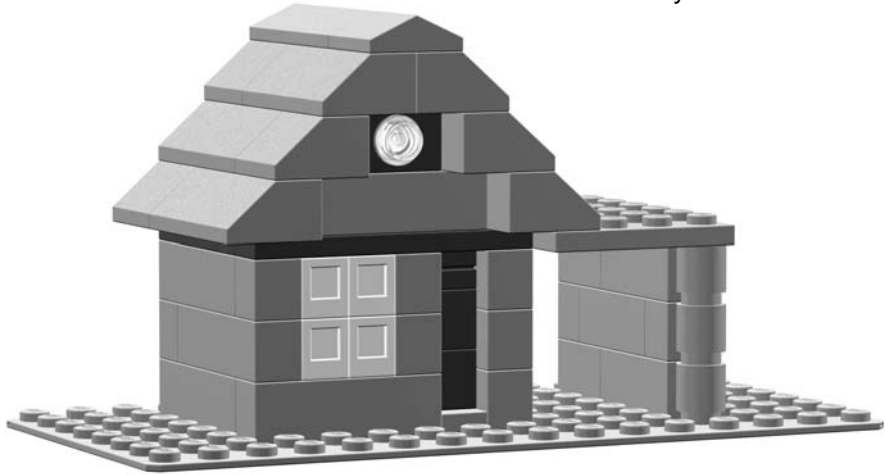


Figure 6-9: This house is much too small for minifigs but just right for a microscale suburbia.

Notice that the door to the house is merely suggested by the recessed darker area to the right of the windows. This is really just another example of the technique I used to suggest the windows for the Empire State Building. Sometimes a change in brick color or depth is all it takes to give the illusion that a particular feature exists when it really doesn't.

### ***Instructions for Microscale House***

The little house shown in Figure 6-9 is a simple model you can probably build from pieces you already have in your collection. Figure 6-10 shows the Bill of Materials for this mini-mansion. This is followed by a series of figures (Figures 6-11 through 6-16) that show the steps you need to follow to build the house.

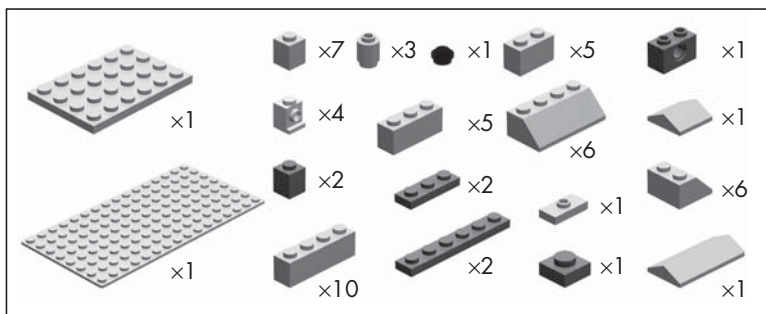


Figure 6-10: The Bill of Materials for the microscale house

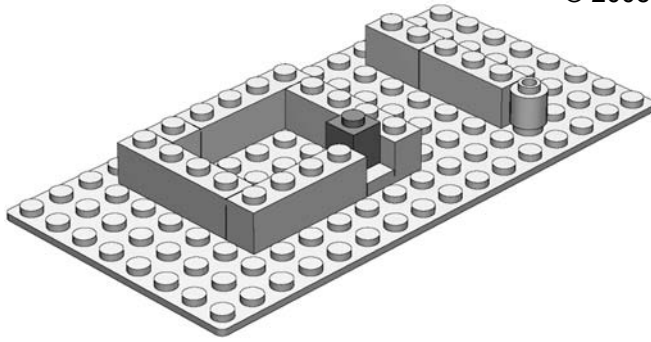


Figure 6-11: Step 1. Place the dark gray 1×1 on an offset plate.

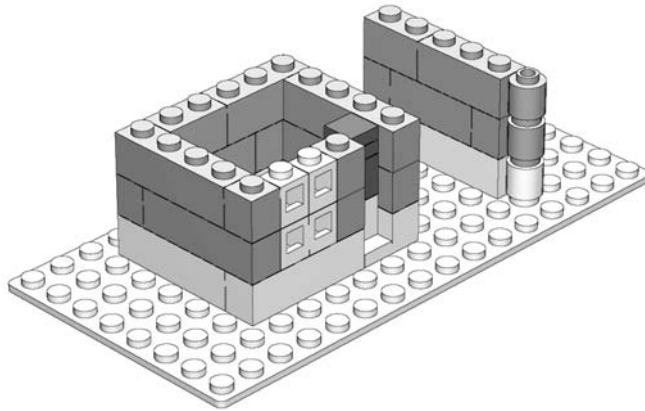


Figure 6-12: Step 2. Install the front windows, which are just 1×1 headlight bricks facing backward.

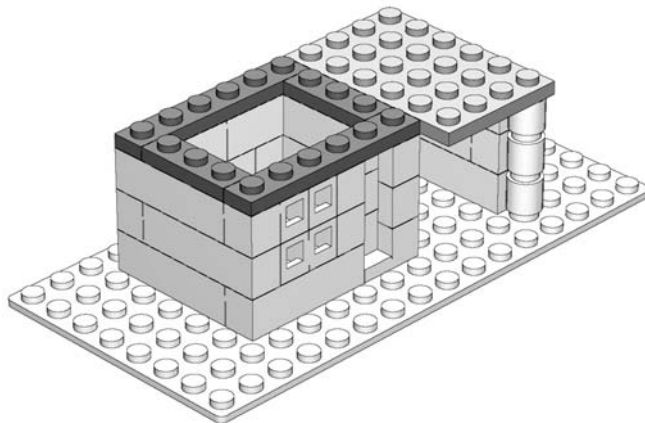


Figure 6-13: Step 3. Place a 1×6 plate near the top front to help hold the windows in place.

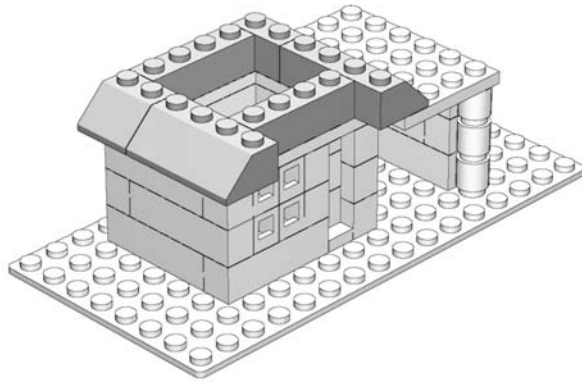


Figure 6-14: Step 4. Start the roof. The slopes on the left should hang over the edge of the wall.

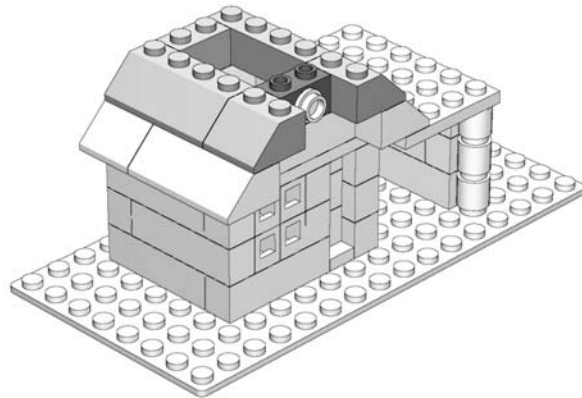


Figure 6-15: Step 5. Place the 1x2 Technic brick in the top center and attach a transparent 1x1 cylinder plate.

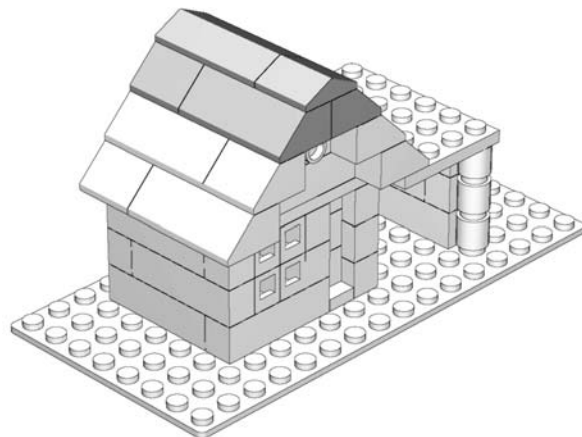


Figure 6-16: Step 6. Complete the roof with a couple of handy peak elements.

Part of the beauty of microscale models is that you don't always need to use specialized parts to finish off your models. Simple bricks, plates, and slopes can become windows, doors, wheels, wings, trees, and so on. Use your imagination.

On the other hand, when you have specialized elements you want to use, you have many opportunities to do so with microscale models. Often, you will need a quick change of direction like that junction elements can offer. Other times, you will want interesting shapes such as macaroni bricks or interesting patterns such as grille bricks. The trick is to see the piece not just as another LEGO element but as the front end of a semi rig (as shown in Figure 6-8) or the windows of a tiny house (as shown in Figure 6-9).

## Review and Suggested Subject Matter

In Chapter 5, I showed you macroscale models—the extra large versions of real life objects. I indicated that when you were looking for ideas for macro models, you might want to pick things that are very small. That way, your jumbo version wouldn't be impossibly large.

In microscale building, the opposite theory applies. Because your goal is to build a model that is much, much smaller than the real life version, you can pick things that are naturally very large. This could mean something as large as a car, or it could mean something enormous, such as a skyscraper or an aircraft carrier.

The following is a short list of things that might make good subjects for microscale building:

<i>Automobiles</i>	<i>Houses</i>
<i>Trucks</i>	<i>Apartment buildings</i>
<i>Buses</i>	<i>Dinosaurs</i>
<i>Locomotives</i>	<i>Zoo animals</i>
<i>Train cars</i>	<i>Amusement park rides</i>
<i>Spaceships from movies</i>	<i>Skyscrapers</i>
<i>Stores or a mall</i>	<i>Pyramids</i>
<i>Construction equipment</i>	<i>Ships</i>
<i>Hotels</i>	<i>Aircraft carriers</i>
<i>Castles</i>	<i>Bridges</i>
	<i>Monuments</i>

Of course, these are just suggestions, and like everything else in the LEGO system, there are no limits to how you apply your own imagination and creativity. Microscale models are an excellent technique to explore when your collection of LEGO elements might be limited in size, though as you've seen, this restriction does not have to limit the scope of your microsized LEGO world.