

# EXPLORING PERSPECTIVE HAND DRAWING

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Fundamentals for Interior Design SECOND EDITION



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## Chapter 2

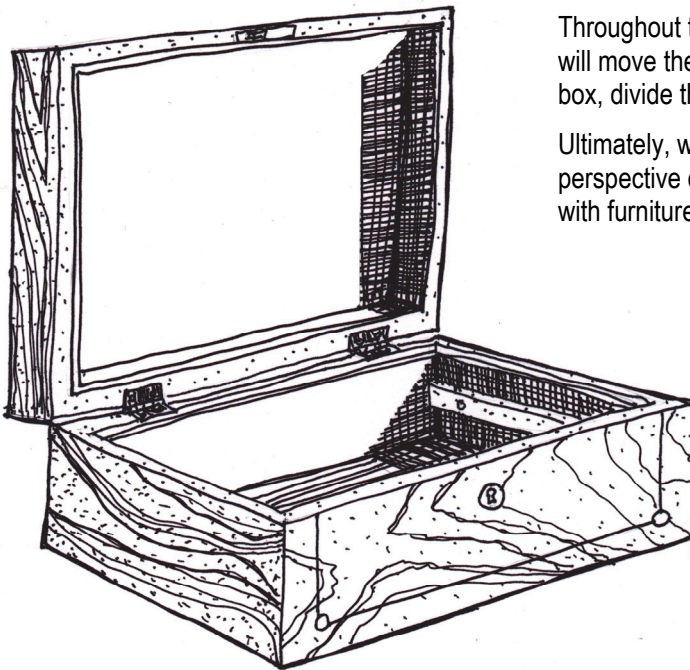
# The Box

The box will be our starting point for learning to draw any object and will provide a method for adding proportion and understanding perspective.

Creating proper proportion and perspective are two of the most challenging aspects of developing successful drawings. The box method helps us achieve both of these goals.

Throughout this book, we will work with the box. We will move the box around, create objects from the box, divide the box, and embellish the box.

Ultimately, we will transform our boxes into entire perspective drawings of interior rooms, complete with furniture and accessories.



## GETTING STARTED

The following are concepts that will help you throughout Chapter 2:

**Proportion.** The correct relationship of size between two or more parts of an object.

**Perspective.** The appearance of a distant object in relation to the observer's distance from it.

**Perspective lines.** Lines that project from the front of the object towards a single vanishing point

**Horizon line.** Imaginary line that is at eye level on a perspective drawing.

**Horizontal line.** Lines of the object that are parallel to the horizon.

**Vanishing point.** The point where parallel lines converge in a perspective drawing.

**Vertical lines.** Lines of the object that are perpendicular to the horizontal lines.

**Leading edge line.** The front vertical line of the box when the corner of the box is facing you

**Parallel lines.** Lines that remain the same distant apart and never meet.

**Perpendicular lines.** Lines that meet to make a right angle (90-degree).

**Scale.** A ratio representing the size on a drawing. Typically, architectural scales include 1/4 inch and 1/2 inch equals one foot.

## VIEWPOINTS

To communicate a design concept fully, drawings of an interior space or of furniture are typically drawn from different points of view. These different views are often categorized as *Perspective Drawings* or *Paraline Drawings*. We will use a subset of these views as we learn to visualize objects and as we learn to draw.

## PERSPECTIVE DRAWINGS

One and two-point perspective views depict space on a vertical plane but with three dimensions, thus creating a more natural view.

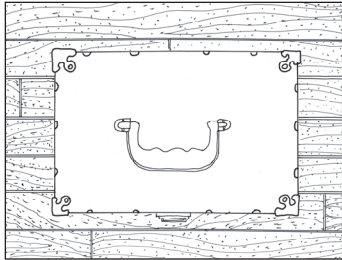
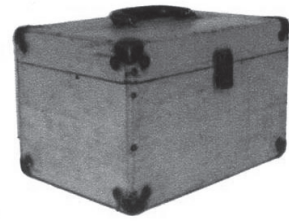
*One-point perspective views* are three-dimensional drawings in which objects have a flat front and the parallel lines depicting depth converge at one single point on an imaginary horizon line in the distance.

*Two-point perspective views* are three-dimensional drawings where objects have a leading edge and the horizontal parallel lines converge at a left and a right vanishing point on an imaginary horizon line.

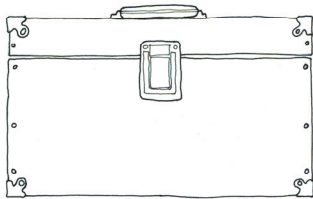
## PARALINE DRAWINGS

*Paraline views* provide a means describe an object visually in three-dimension *and* to scale. Lines that are parallel in reality remain parallel in the drawing.

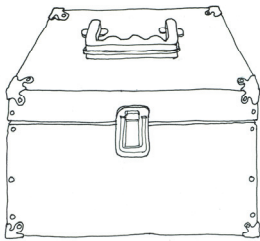
The following drawings of the box shown in the photograph represent the different views and aspects of the box design.



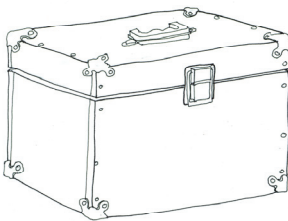
This is the *top view* of the box. You are looking directly down on the box and there is no depth shown in the handle. You will see the details of the box top and the wood flooring. This drawing was done using a scale.



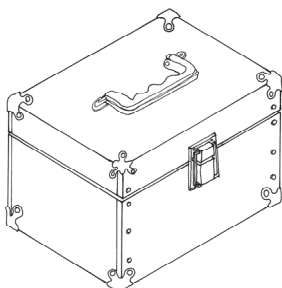
This front view shows detail of the object in an *elevation view*. Elevation drawings do not show depth. This drawing was done using a scale.



A *one-point perspective view* provides a three-dimensional depiction of the box. Notice the flat front of the box and the parallel lines forming the sides of the top recede toward a single point. The proportion was drawn without a scale.



A *two-point perspective view* also depicts a three-dimensional aspect of the box. In this view, there is a leading edge and each side appears to get smaller as they move away from the leading edge. The proportion was drawn without a scale.

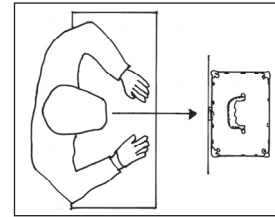


This *paraline* drawing shows the three dimensional qualities of the box. However, it is distinctly different from a perspective drawing because parallel lines do not converge and a scale was used to complete the drawing.

# ONE-POINT PERSPECTIVE

## FLAT FRONT BOXES

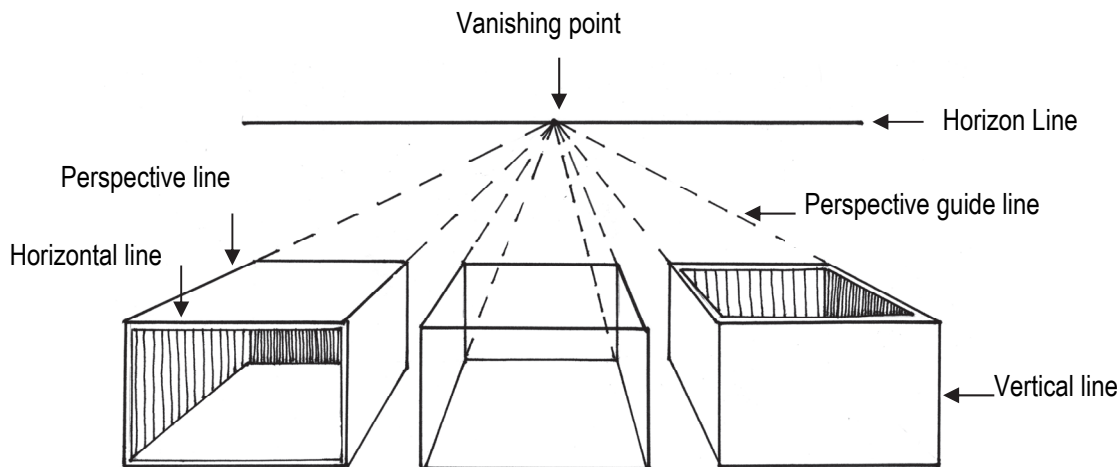
Drawing an object in perspective provides a realistic view and is therefore an important type of drawing for the interior designer. To view a box in a *one-point perspective*, hold it with a flat front facing you and so the two sides appear to move toward a single point in the distance.



The surface area of the picture, or the *picture plane*, is often thought of as a window through which you are seeing the three dimensional object. In the one-point perspective, the picture plane is perpendicular to your view of the object and the object has a flat front.

With a one-point perspective box, or a flat-front box, the three types of lines you will draw to make the box include horizontal, vertical, and perspective lines.

Notice the boxes drawn below and the use of these lines. They each have a front that is a rectangular shape and the lines defining the side edges of the box move toward a single vanishing point on the horizon line. The vanishing point is stationary and the perspective lines project toward this point.

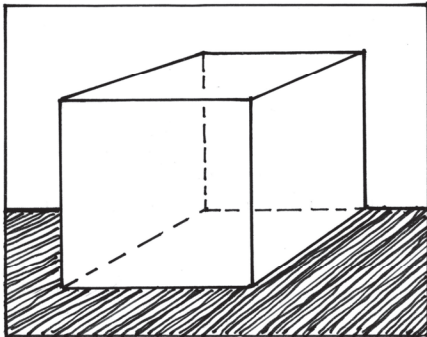


### Helpful Hint:

Perspective drawings are different from scale drawings because the scale drawing uses measurements to note size. A perspective drawing represents how our eyes see the world naturally, which is not in a measured scale. Objects are scaled relative to the viewer. Additionally, an object is often scaled unevenly: a circle often appears as an ellipse, a square can appear as a trapezoid, and objects appear to get smaller as their distance from the viewer increases. This distortion is referred to as foreshortening and is a technique that helps create the illusion of depth.



## ONE-POINT PERSPECTIVE BOX STEP-BY-STEP



Throughout this book, the starting point for drawings objects and furniture pieces is the box shape. The transparent box provides a way to see the volume of the shape. In this section, we will detail a series of steps to create the one-point perspective box. In this example, we will use a box that is below the eye level or horizon line. The box is drawn with three types of line - a parallel line, a perpendicular line, and angled lines from the vanishing point. The dashed lines in these illustrations are the perspective guidelines.

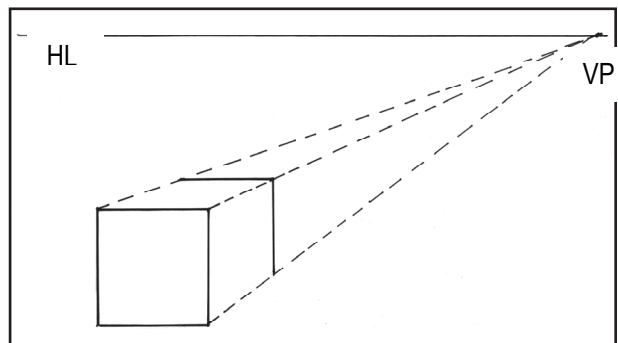
### Drawing Visible Edges:

① The horizon line (HL) is the solid line on top with the single vanishing point (VP) on the far right side.

② Draw the flat front square box below the horizontal (HL) making the top lines parallel to the horizon line and the vertical lines perpendicular.

③ Starting at the outside top corner, draw dashed lines to the vanishing point with a straight edge tool. Repeat this for the other two corners.

④ Give the box depth by drawing the solid back lines of the box. The top edge is horizontal and parallel to the horizon line and the side edge is vertical and perpendicular to the horizon.

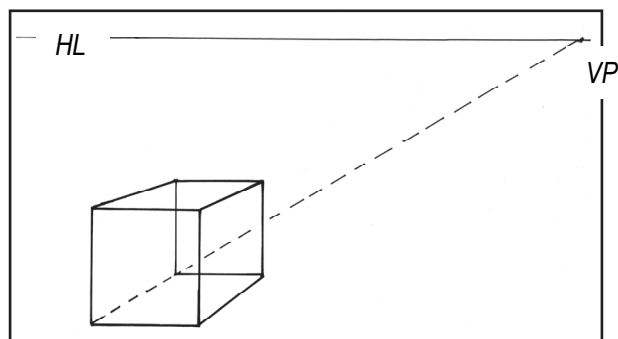


### Drawing Hidden Edges:

① Starting at the bottom left front corner, draw a dashed line to the vanishing point.

② Draw a solid line from the back right corner, parallel to the horizon line until it meets the dashed perspective guideline.

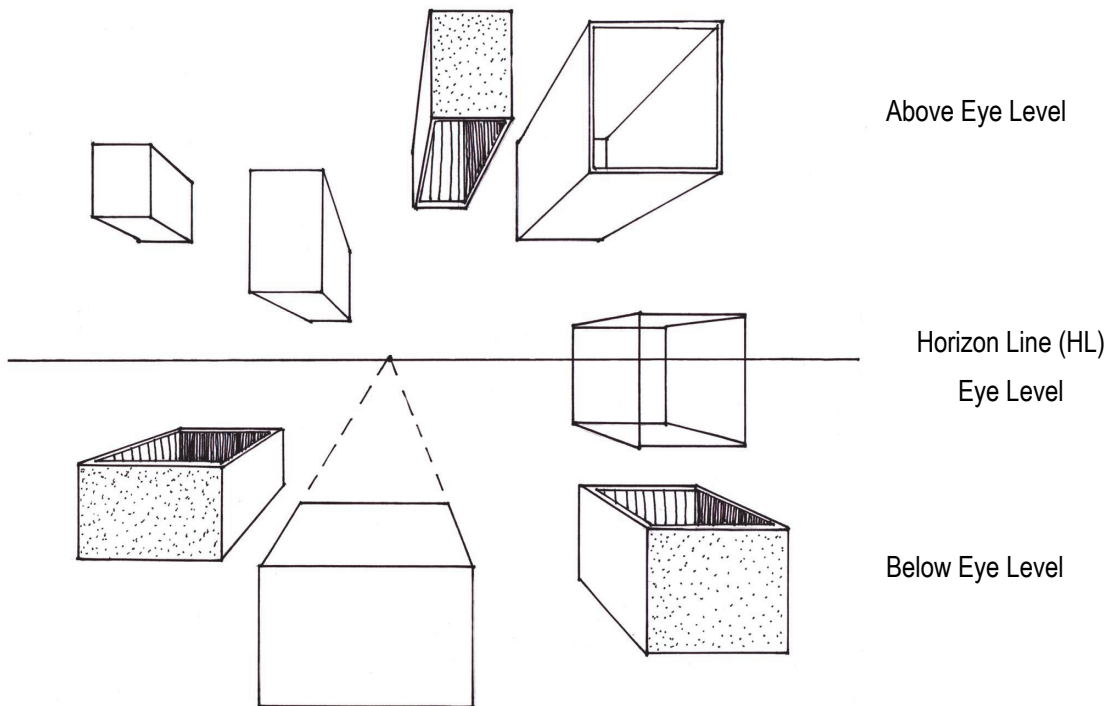
③ To finish the box shape, where the back box line meets the dashed perspective guideline, draw the vertical line, perpendicular to the horizontal line (HL)



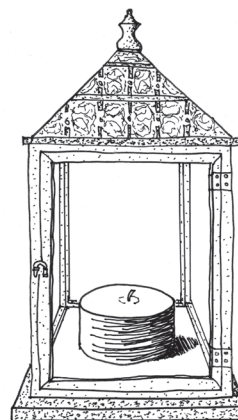
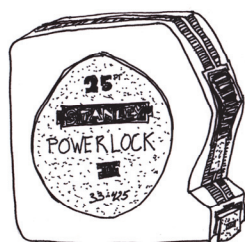
## CREATING ONE-POINT PERSPECTIVE OBJECTS

In the drawing below, objects are at varying points relative to the horizon line. Again, each one-perspective box was created as follows:

- 1 Start by drawing a single flat rectangular shape above, below or on the horizon line.
- 2 Add perspective lines using the vanishing point as a guide for creating the proper angle.
- 3 Add additional horizontal and vertical lines to complete the back of the box.



The objects below are in one-point perspective. They each have a flat front and perspective lines converge at a single imaginary vanishing point.





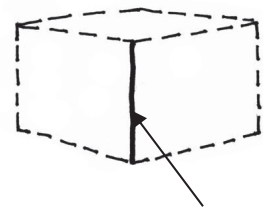
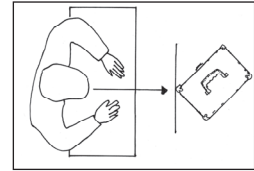
## TWO-POINT PERSPECTIVE

### LEADING EDGE BOXES

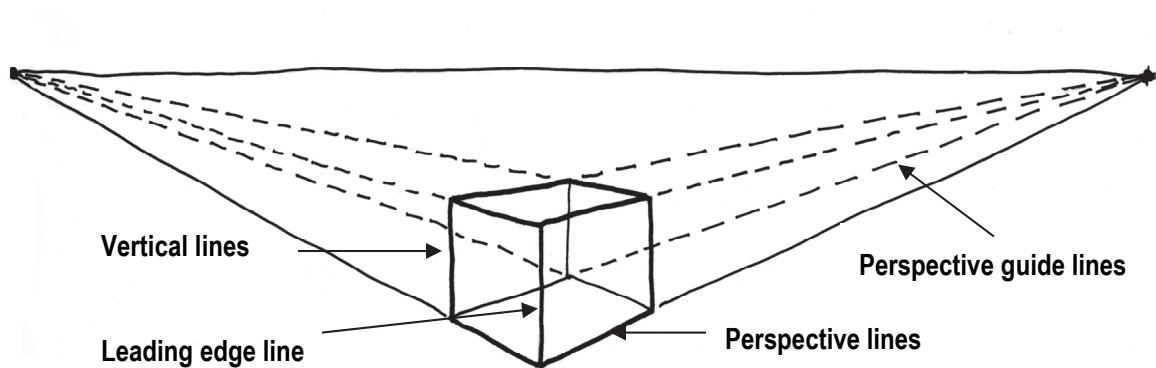
Another type of design perspective is the *two-point perspective*. In this view, we will turn the box so the corner is facing you, which creates a *leading edge*. *Perspective lines* project and converge at two different points on the *horizon line*. In a two-point perspective drawing, the object is placed on a 45-degree angle and the leading edge is on the picture plane. Also, only vertical lines and perspective lines are used to draw the box.

Notice how *perspective lines*, those that make up the top and sides, project towards two separate vanishing points on the horizon line.

The remaining *vertical lines* complete the shape of the object and are parallel to the leading edge.



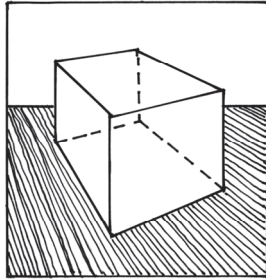
Leading Edge



#### Helpful Hint:

One of the challenges to drawing boxes or objects in two-point perspective in your activity book is that the vanishing point locations on your paper are very close together causing the drawing of a box shape to look unrealistic and distorted. This is because, for the purpose of learning the two-point perspective concept, we are using two vanishing points on a piece of paper that are actually too close together. In reality, the correct vanishing points are about 6 feet apart. Imaginary vanishing points and guidelines are used as you become more familiar with the drawing steps.

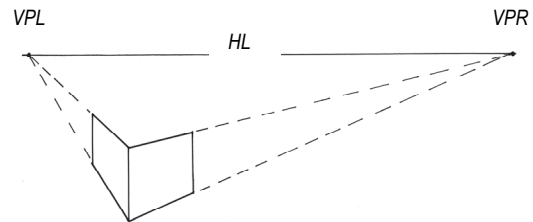
## TWO-POINT PERSPECTIVE STEP-BY-STEP



As we did with a one-point perspective box, we will detail the steps for drawing the transparent two-point perspective box. Again, we will start with an object positioned below the horizon line. The dashed lines represent perspective guidelines.

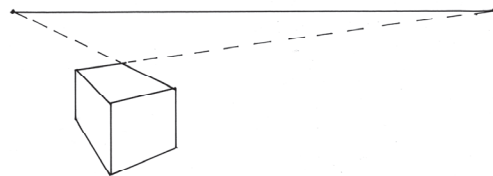
### Drawing the Front Edges

- 1 Draw the horizon line (HL) with two vanishing points - one on the left (VPL) and the other on the right (VPR).
- 2 Draw the leading edge - a line that is perpendicular to the horizon line. The length of this line will determine the size of the box.
- 3 Draw lines from the top and bottom of the leading edge to the vanishing points.
- 4 Give the box depth by drawing solid vertical lines between the two perspective guidelines. Draw solid lines on the top and bottom of the box shape as shown above.



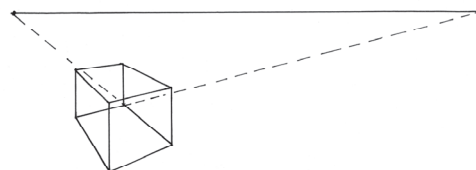
### Drawing the Top of the Box:

- 1 Starting with the top left corner, draw a perspective guideline from this corner to the right vanishing point (VPR).
- 2 Repeat this with the top right corner to the left vanishing point (VPL)
- 3 Where the perspective guidelines intersect will be the top of the box. Draw solid lines representing the box top shape as shown.



### Drawing the Back of the Box:

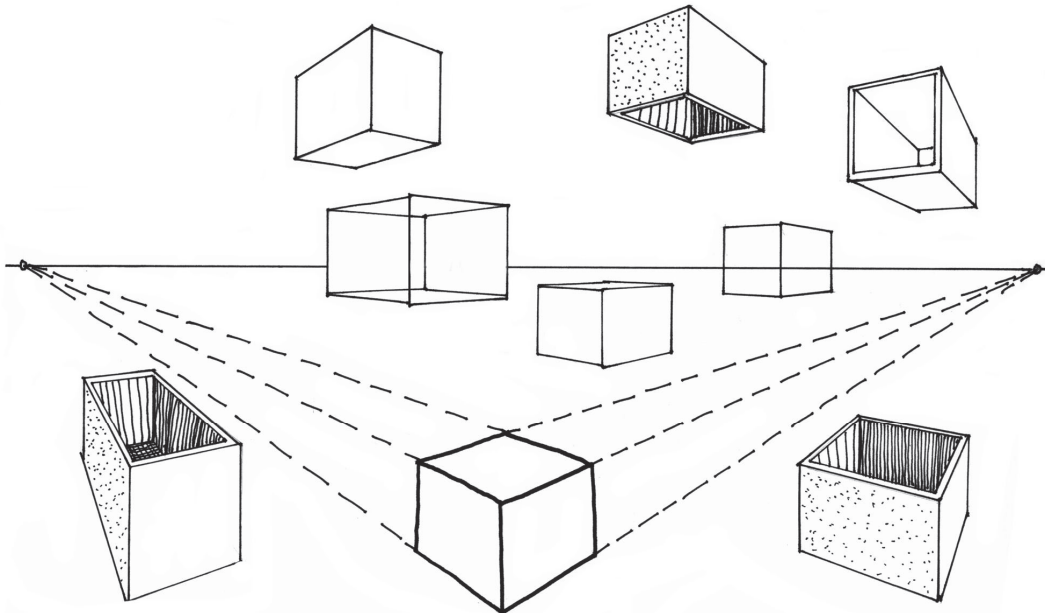
- 1 Starting with the lower left corner, draw a perspective guideline from this corner to the right vanishing point (VPR).
- 2 Repeat this with the bottom right corner.
- 3 Where the perspective guidelines intersect will be the bottom of the box. Draw solid lines representing the bottom of the box shape as shown.



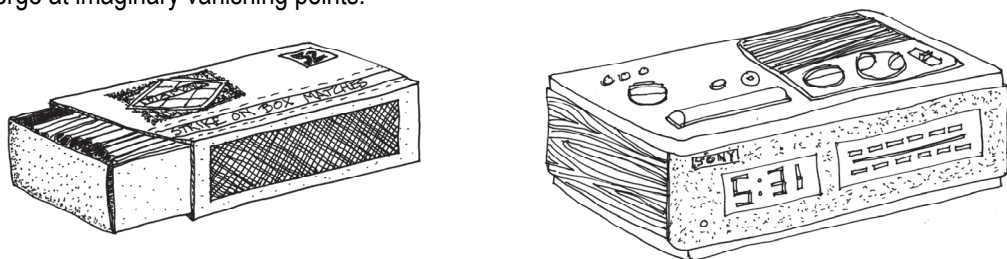
## CREATING TWO-POINT PERSPECTIVE OBJECTS

In the drawing below, objects are at varying points relative to the horizon line. The boxes were created using the following steps:

- 1 Mark a left and a right point on the horizon line to denote the vanishing points used to establish perspective.
- 2 Draw a vertical line anywhere above, below, or over the horizon line. This will define the leading edge of your box.
- 3 Add perspective lines starting from the top and bottom of the leading edge line. These lines are angled so that they are directed towards either the left or the right vanishing point.
- 4 Add additional vertical lines to complete the back edges of the box.



The objects below are in two-point perspective. They each have a leading edge with perspective lines that converge at imaginary vanishing points.



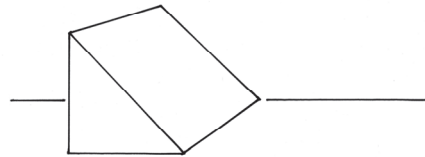
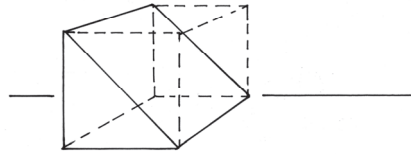
## OTHER GEOMETRIC SHAPES

The transparent box shape can be a starting point for drawing other geometric shapes.

The wedge shape is an example of subtracting from the box shape.

The adjacent drawing started with a transparent one-point perspective box shape. Create the wedge as follows:

- 1 Draw a diagonal line from the front top back corner to the front bottom corner.
- 2 Repeat in the back of the box.
- 3 Erase dashed lines and the wedge shape remains.



## THE BOX LID

Adding an open lid to the box shape has several extra steps to create an alternate vanishing point (AVP) to form the angled lid surface. You will see this technique used with exterior roof pitches and interior vaulted ceilings. The drawings below start with a two-perspective box shape.

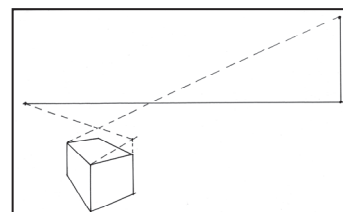
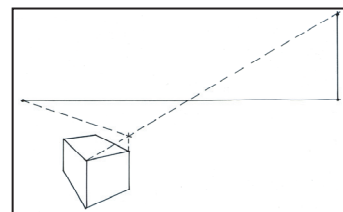
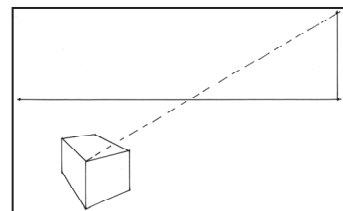
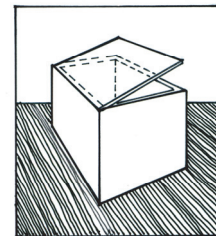
1 Start with the top front left point on the box and draw a perspective guideline at the angle of the open top. Where this line and the perspective guideline intersect will become the alternate vanishing point (AVP)

2 From the top far right corner of the box, extend this line until it intersects with the perspective guideline.

From the left vanishing point, draw a guideline to this intersection.

3 From the top back left point on the box, draw a perspective guideline to the (AVP).

From the left vanishing point (VPL) draw a perspective guideline to through the perspective guidelines from the (AVP). Where these lines intersect will create the lid of the box. Finished box top has the double lines showing the thickness of the box top and the edge of the box. The dotted lines represent the hidden portion of box.

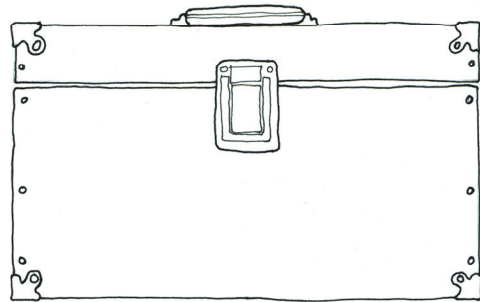
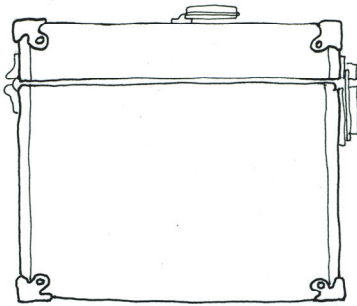


## ELEVATION & PARALINE DRAWINGS

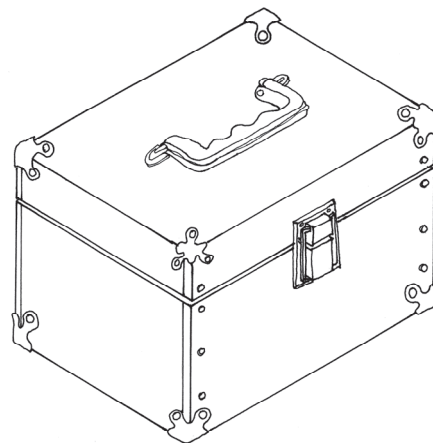
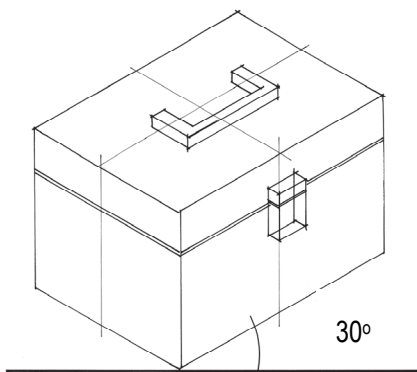
Interior design drawings typically show spaces and buildings viewed from several different viewpoints.

One commonly used view is the *elevation view*, which is a side view of an object and does not show depth. The item drawn will appear to be flat and is to scale.

Here two drawings of a box using an *elevation view* of the side and front. Notice the details of each drawing.



The *paraline* drawing shows an object in three dimension. The *paraline* drawing differs from the *perspective* drawing in that it is to scale and parallel lines do not converge at a vanishing point. There are different types of *paraline* drawings, which we will not cover in this book. For reference, the one below, is drawn with a 30-degree angle and is called an *isometric paraline* drawing. These drawings are often used in the field when measurements of the components are important, such as when designing open office system furniture.



## PROPORTION

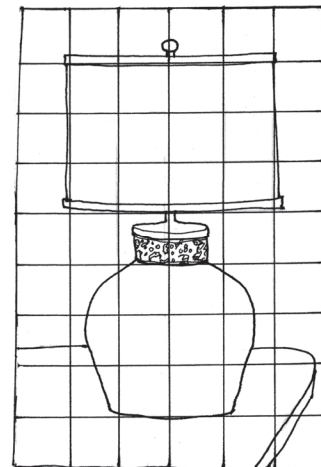
Now that you are more familiar with different points of view, we are going to introduce the concept of proportion as a technique for creating drawings that are more realistic.

Proportion involves the comparative relationship of size and position between objects or between parts within an object. Good proportion adds harmony and symmetry among the parts of a drawing as a whole. When an object's components are drawn without the correct size relationship, it is out of proportion.

## GRID TECHNIQUE

One technique for determining proportion is to start with a grid divided into equal parts. This works well when you are using an existing picture as your drawing inspiration. The lamp in this example was drawn as follows:

- 1 Draw a 1/8 inch grid on tracing paper and over the original image in order to obtain relative proportion.
- 2 Notice how the lamp fits into the grid. The lampshade is four blocks wide and the bottom of the shade starts five blocks from the bottom of the grid. The lamp is vertically centered relative to each edge. The base of the lamp is three blocks high at its tallest point and the neck of the lamp is about one block tall.
- 3 Create a grid with light pencil lines and using a scale that is appropriate for your drawing. The grid may be smaller or larger in scale, depending on the size of the original image and the size of your drawing. In this example, a 1/4 inch grid was created to help create a drawing that is twice the size of the lamp image. Using the proportion information you gained from the original image you can draw the object on your grid.

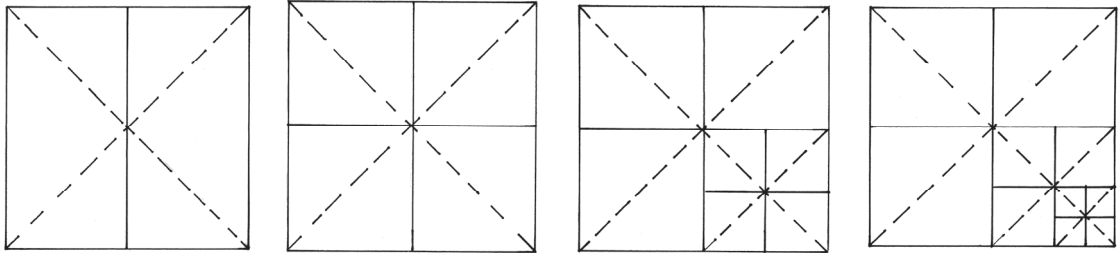


In this drawing of a sofa, the grid lines were only placed around the outside of the rectangle. Using your eye, you will note the vertical center of the sofa is in the middle, the top of the sofa is half way between the horizontal center and the one-quarter mark. The arms of the sofa are close to the edge. When drawing this image, start with a light rectangular shape and light lines for the grid division. These will provide guides for redrawing the image in proper proportion.



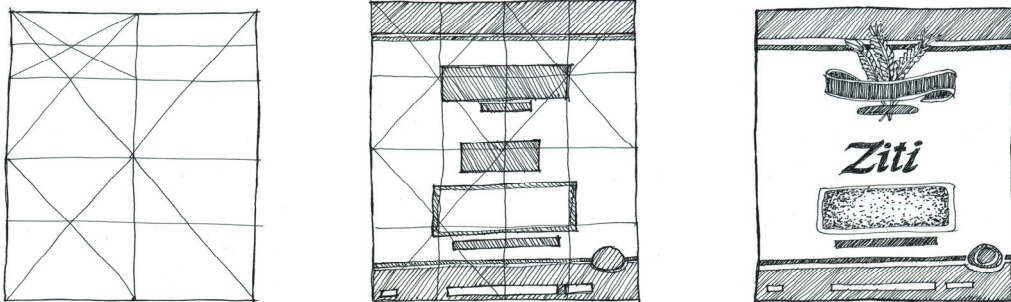
## DIVIDING-THE-SQUARE TECHNIQUE

Dividing-the-square is a technique for finding the exact center of a square and thus helping to properly position parts within the box. Here are the steps to use:



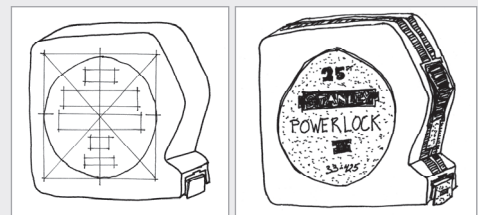
- ❶ Starting with the outline of your box, draw diagonal dashed lines from corner to corner creating an "X". This will give you the middle of the square.
- ❷ Then draw a cross through the center. The square is now divided into eight triangles.
- ❸ Now continue dividing in the same manner. You will end up with a wall of equal parts with points equidistance apart to act as guides for creating properly proportioned and positioned parts.

The drawing of the box of noodles was created using this technique. Below is a series of drawings showing the progression. After creating guidelines using this technique, the lines and points were used to properly position and proportion the parts.



### Helpful Hint:

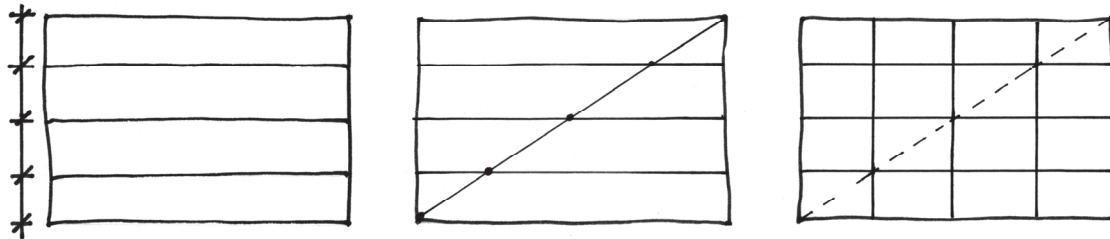
A technique for insuring the correct proportion and size of a pattern is to use a grid or other guide lines. The measuring tape drawing used light pencil guide lines and rectangular shapes to outline the pattern on the label. This gives you the opportunity to visually check your drawing before moving forward with your marker.



## DIVIDING TECHNIQUES

The drawing steps below provide another technique for dividing a rectangular shape. This technique can be used to proportion the shapes as they recede in perspective.

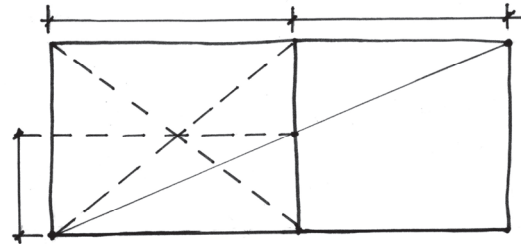
- 1 The first step is to measure and mark the divisions on the left vertical line.
- 2 At these points, draw horizontal lines parallel to the top and bottom lines.
- 3 Draw a diagonal line from the bottom left corner to the top right corner. Draw vertical lines where the diagonal line intersect with the horizontal,



## ADDING TECHNIQUES

The steps for extending a rectangular box:

- 1 Find the center using the “X” method.
- 2 Next, draw a guideline from the bottom corner through the midpoint to meet the extended top line. These two rectangular shapes will be the same length.

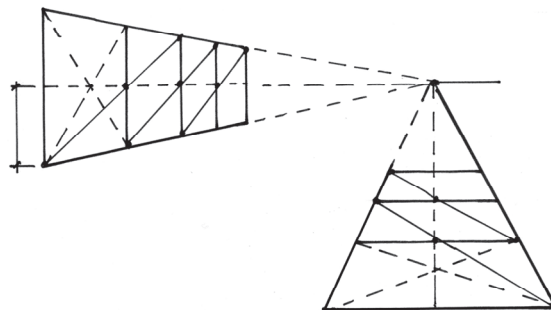


## FORESHORTENING PERSPECTIVE

Foreshortening is a technique in perspective drawing to create the illusion of an object receding into the distance or background.

There is an illusion of depth created when parallel lines on a flat surface get smaller as they move away from the front.

A familiar example of foreshortening would be when you look down a long straight road lined with trees, the two edges of the road appear to move towards each other, and the trees appear smaller the further away they are. The adjacent image uses the techniques of dividing-the-box to create a foreshortening perspective.

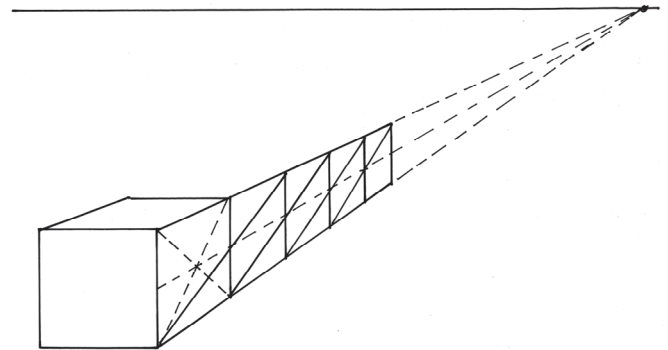
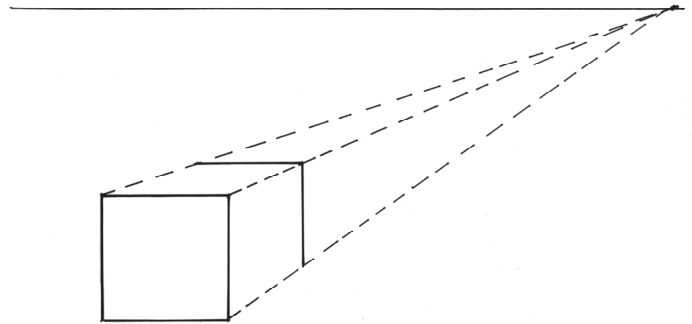


## CREATING OBJECTS USING FORESHORTENING

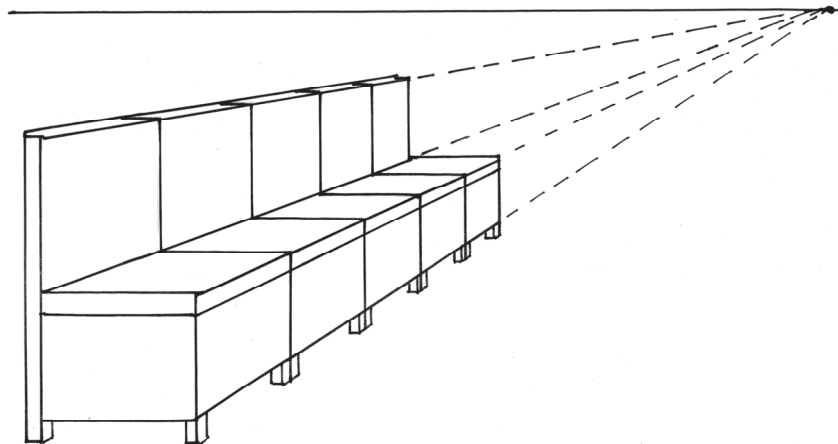
Creating the illusion of depth in a perspective drawing begins with the techniques of dividing and adding as illustrated on the previous page. With a series of diagonal lines that are created with the division formula, you can show shapes that are the same size but appear smaller as they move from the foreground.

In this series of drawings, a typical one-point perspective box is the starting point. Follow these steps to create a series of equal size chairs displayed in a foreshortened perspective.

- 1 Find the center of the side box shape using the "X" method.
- 2 Next, draw a guideline from the bottom corner through the midpoint to meet the extended top line. Where these two lines intersect, draw a vertical line. This creates the correct receding proportion of that shape.
- 3 Continue in the same fashion to create additional receding shapes.



The last drawing demonstrates how to draw multiple chairs in foreshortened perspective using this method.

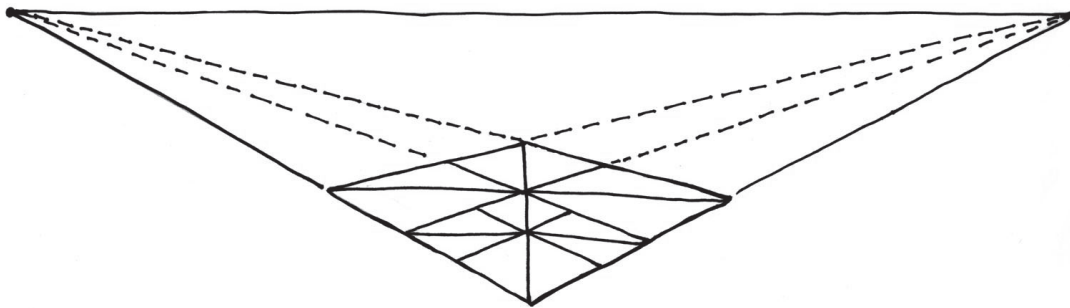


## PROPORTION IN PERSPECTIVE

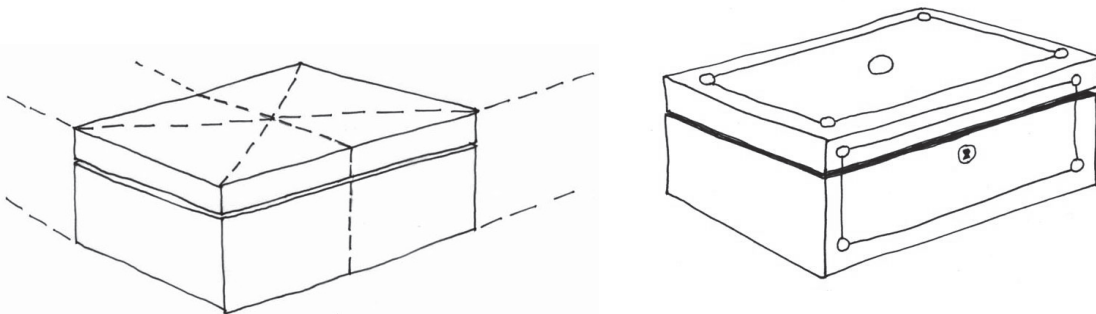
Dividing-the-square technique becomes particularly useful when trying to properly locate points within a perspective drawing. Remember, scale drawings are different from perspective drawings because the proportions are measured. A perspective drawing represents how our eyes see the world naturally, which is not to scale. For this reason, proportions of a square or an object in perspective will be found using perspective guidelines to make the divisions in the square or object.

In the drawing below, divide the square by following these steps:

- 1 Draw an "X" by drawing lines from corner to corner. This establishes the middle of the square in perspective just as it did in the square.
- 2 Draw a cross at the midpoints by finding a line that projects through the center and toward the opposite vanishing point.
- 3 Continue to use perspective guidelines to further divide the square into equal parts, which are also in proper perspective.



When drawing an object in two-point perspective it is important to have realistically proportioned details. In the example below, perspective guidelines were used to divide the top of the box. This located the center which provided the correct location of the round pearl on the top and the key hole location on the side.



## CREATING PROPORTION IN PERSPECTIVE

Here is an example of using the "X" technique to illustrate ribbon on a box.

1 Start with the top of the box and locate the center by using the "X" technique.

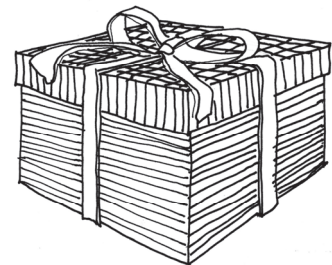
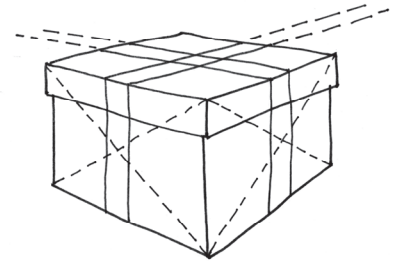
2 Draw the edges of the ribbon in using the two vanishing points.



3 Where the ribbon edges meet the side of the box, add vertical lines to create the ribbon on the sides of the box.

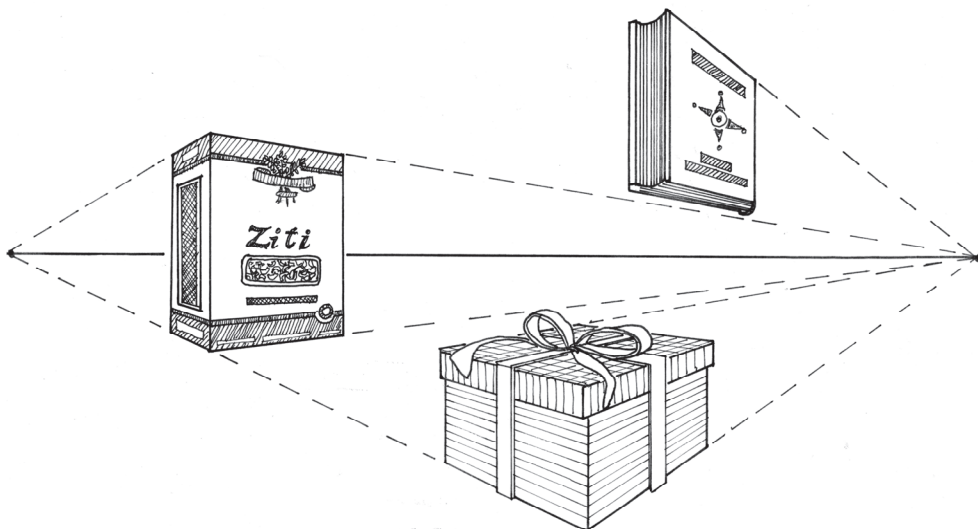
4 Draw another line parallel to the ribbon edge to create depth.

5 Two free-form loops create the bow shape, with the center knot and the two ribbon lengths draping over the box.



6 In the finished drawing, vertical and horizontal lines were added to create contrasting values between ribbon and box.

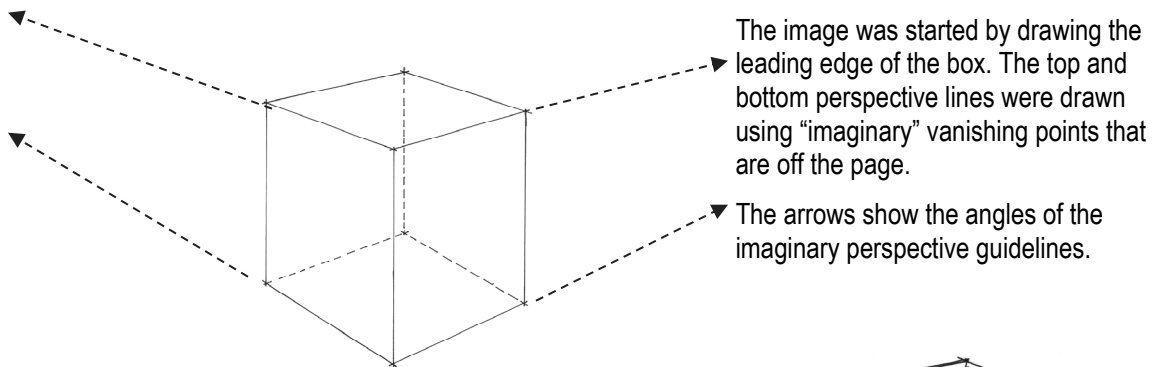
Here are several objects shown in two-point perspective. Notice the details added to each object continued to use the vanishing points for locating the vertical lines. The extra perspective lines are not shown in this image and yet they were used to help create proper proportion and perspective..



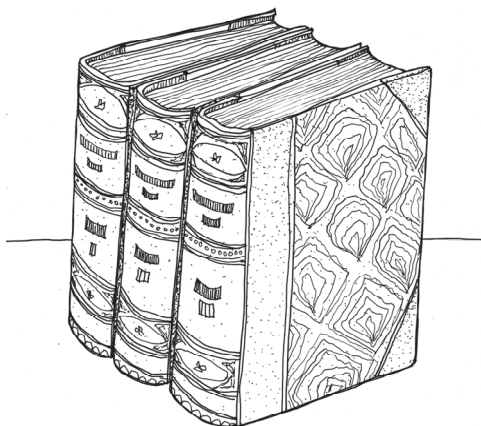
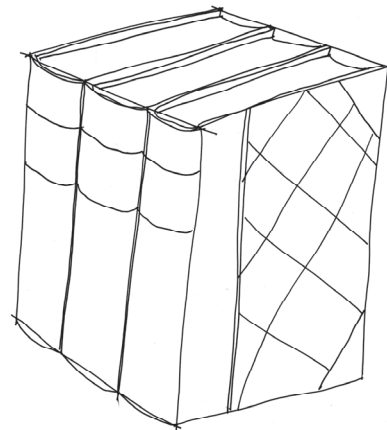
## ADDING DETAIL TO THE BOX

Combining what we have learned about drawing in perspective and proportion, we can now create detail drawings of objects that are more elaborate. The drawing series below shows how to move from a simple two-point perspective box to a finished drawing of three books.

First, we create a two-point perspective box, but this time using vanishing points that are more realistic. In our previous exercises, we created boxes with vanishing points only inches away from each other. In reality, if we are trying to represent a realistic perspective, the vanishing points would be several feet apart. With this in mind, drawing two-point perspective objects like books, requires using “imaginary” vanishing points to create more realistic images. You will need to start imagining the vanishing points in order to obtain the proper angles of your perspective lines.



The box was then divided into three books using the “imaginary” vanishing points. The left side plane was further divided to depict the binding design. Additional lines were added to the top plane to show the division of the books. Design was added to the right plane by using a diagonal grid to act as a guide for adding pattern for the front cover.



In the finished drawing, value and pattern were added. This will be covered in more detail later in the book.

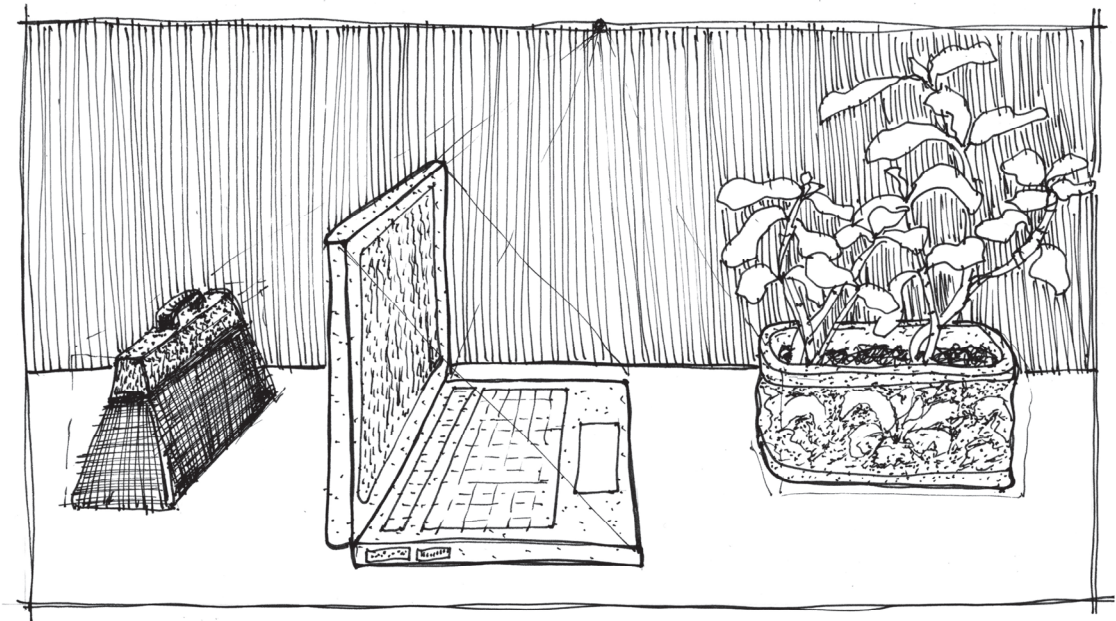
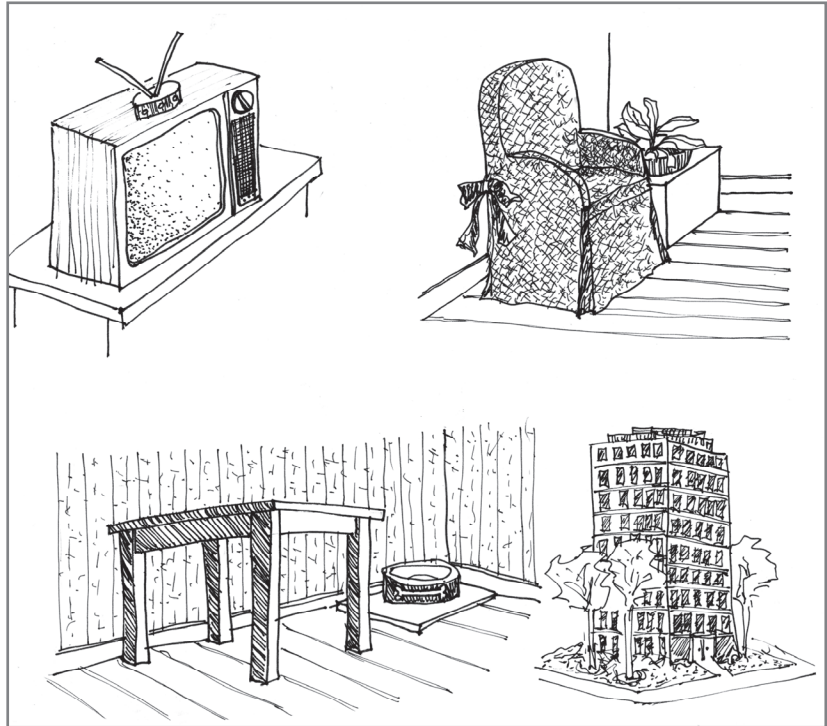


## SKETCH PRACTICE PAGE

Using your sketchbook page as a place to play and practice allows you space to draw different objects more freely.

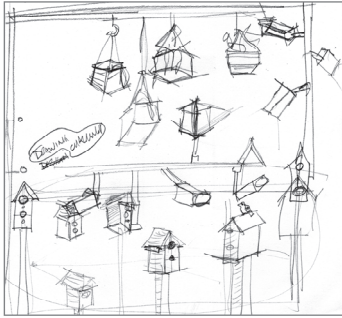
Try coming up with an unusual point of view for your sketch. Consider a close-up view or views from above or below.

Having fun with your sketch time will keep your technique loose.



## PUTTING IT TOGETHER

It is exciting to start using your hand drawing skills to generate ideas from sketches. Using a single subject for practice is a good technique to help develop ideas. Here is a series of images that show the process of sketching to a finished drawing.

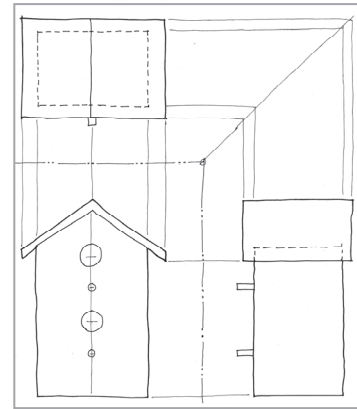


1

In this sketchbook page, I was exploring ideas for a box shaped object that I could use in a drawing. This included hanging planter boxes, light fixtures and birdhouses. This type of sketching is a method for thinking visually. Instead of talking through your design ideas, you are drawing shapes and objects, quickly filling up the sketch page.

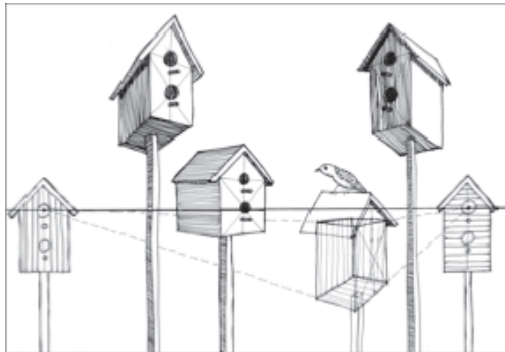
2

After playing around with these images, the birdhouse image became the focus for the final drawing. To visualize more clearly the proportion and parts of this shape, a multi-view image was drawn.



3

It actually took two drawings to get an image that was successful. After evaluating this first drawing, several elements were unsuccessful. The birdhouse with the bird perched on top was too confusing to understand.



4

Here in the final drawing, I added more interest to the birdhouses on the side and the transparent birdhouse is reading more successfully. Leaf shapes were included to add interest.



## Creativity Strategy

# LOSE THE REFEREE

When you are starting to learn how to draw, it is easy to get stuck by your own expectations. In the beginning, your images may not look like the object, they may be out of proportion, and your drawings may not be as well as another student. If you are just learning to draw, it is unreasonable to expect your drawings to be perfect. It is unreasonable for you to expect to be as good as someone who already has some drawing experience. Unreasonable expectations can become a huge obstacle to learning, especially if they are preventing you from moving forward. If you find yourself being too critical, try to imagine that you are in a kindergarten class learning to draw. When we were children, we had little expectation and therefore we were not afraid to explore. Drawing was fun because we were all artists.

Consider what happens in a playground. The schoolroom door opens and out rush 15 kindergarten students who have been inside sitting at their desks all morning. They scatter through the playground - a couple of students on the swings, a few in the sand box and some going down the slide. Next thing you know, they are spontaneously jumping over to a different area. Are the students learning as they play? Of course they are. Is anyone scoring their play? Does the teacher have a clipboard to note progress on their play with a grade? Is there a referee blowing a whistle? No! This is time to explore, experiment, and enjoy trying new activities.

Allow yourself the freedom to play around with your new drawing skills. Loose the referee as you practice making a line, drawing boxes and adding texture. This attitude of being open and allowing yourself to explore new activities will serve you well as you take on the challenge of learning to draw. Have fun and go play!

