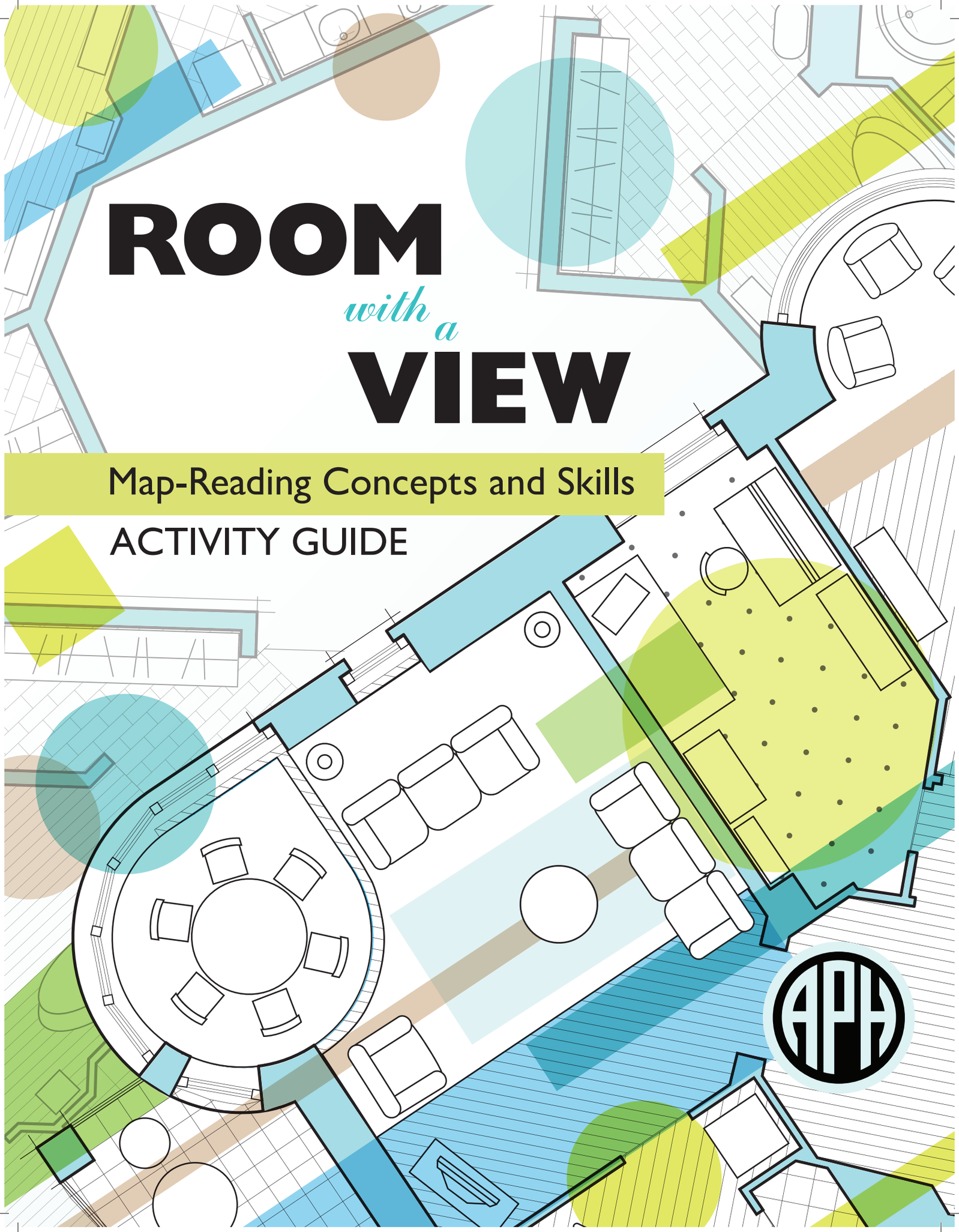


ROOM *with a* VIEW

Map-Reading Concepts and Skills

ACTIVITY GUIDE

Room with a View: Map-Reading Concepts and Skills

Activity Guide

by

Karen J. Poppe

Braille and Tactile Literacy Product Manager

Catalog Number 1-03136-00

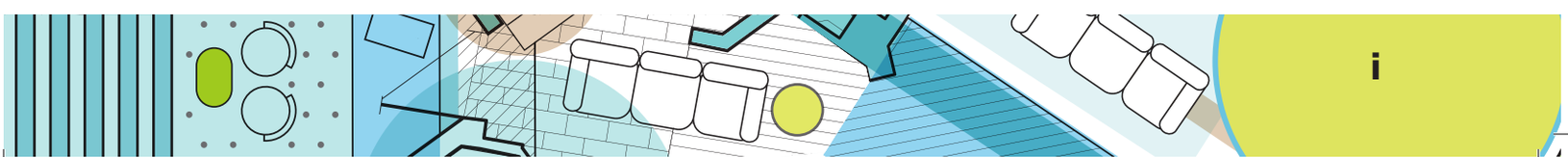
AMERICAN PRINTING HOUSE

1839 Frankfort Avenue

Louisville, Kentucky 40206

502-895-2405 • 800-223-1839

aph.org • info@aph.org



Room with a View: Map-Reading Concepts and Skills

Catalog Number: 1-03136-00

Author: Karen J. Poppe, APH Braille and Tactile Literacy Product Manager

For information regarding permissions, contact:

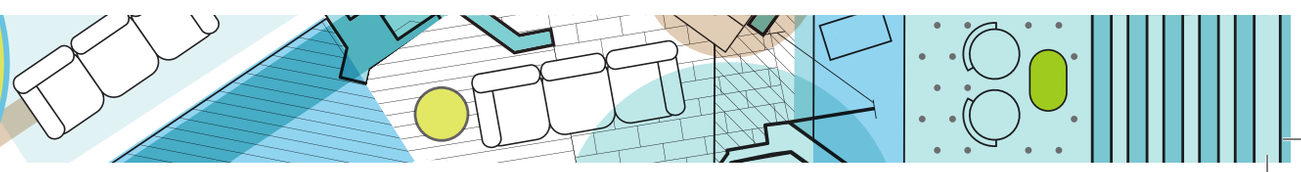
American Printing House for the Blind
Research, Evaluation, and Digital Information Services

1839 Frankfort Avenue

Louisville, Kentucky 40206

502-895-2405 • 800-223-1839

aph.org • info@aph.org



Project Staff

Braille and Tactile Literacy Product Manager/Author
Karen J. Poppe

Product Specialists/Editors
Bobby Fulwiler
Emily Grimany

Pattern/Model Makers
Andrew Dakin
Ben Taylor

Director of Technical and Manufacturing Research
Andrew Moulton

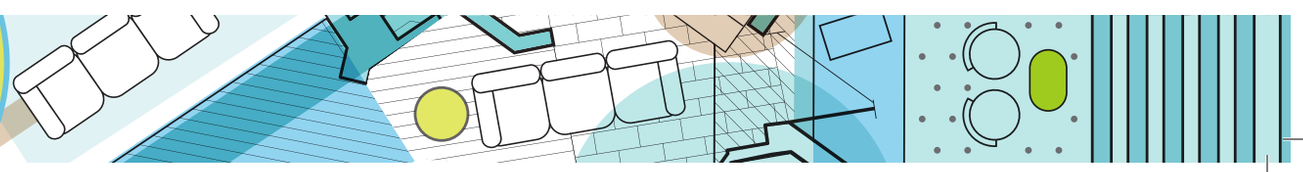
Manager of Technical and Manufacturing Research
Rod Dixon

Manufacturing Specialist
Patrick White

Graphic Designer/Photographer
Laura Greenwell

Graphic Designer
Matthew Poppe

Table of Contents



Product Overview

Room with a View: Map-Reading Concepts and Skills provides an interactive "room" with an assortment of realistic 3D models that are used in combination with corresponding 2D tactile maps. A variety of interior layouts of single rooms (e.g., bedroom, kitchen, school classroom) and larger venues (e.g., grocery, library) can be represented and constructed with the included materials. The kit's primary purpose is to encourage and accommodate the development of map-reading skills and understanding of spatial concepts by students who are blind or low vision. Specifically, **Room with a View** provides students with the following:

- an interactive platform for mapping common indoor environments
- exposure to tactile graphic displays within a purposeful context
- opportunities to transition from three-dimensional, concrete representations to two-dimensional, abstract tactile maps and displays
- familiarity with various perspectives (e.g., top view, side view, front view)
- a tool for practicing and demonstrating knowledge of many basic spatial concepts (e.g., *next to, between, near, behind, through*)
- opportunities to independently construct tactile maps

Although intended for beginning map readers, **Room with a View** can be enjoyed and used by older students and adults who may need experience reading and interpreting tactile maps, or who may just enjoy constructing their own room layouts.

Kit Components

Room with a View consists of the following items:

⚠ WARNING:

CHOKING HAZARD - Small parts. Not intended for children ages 5 and under without adult supervision.

- Assortment of 3D models separated into the following color groupings:

  White group

  (1) bathroom sink

  (1) kitchen sink

  (1) toilet

  (1) staircase

  (1) computer monitor

  (1) flatscreen TV

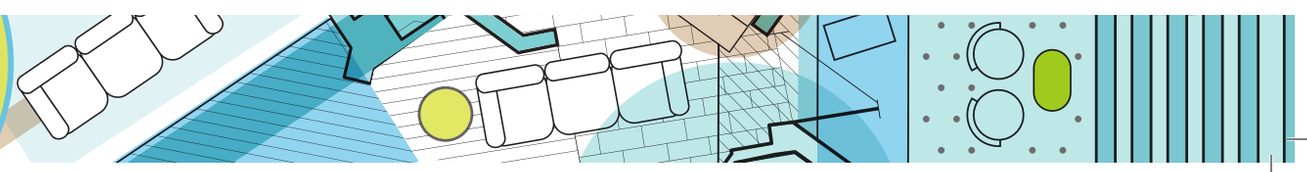
  (4) straight-backed chairs

  (4) chest of drawers/dresser

  (4) small bookshelves (also represent office file cabinets)

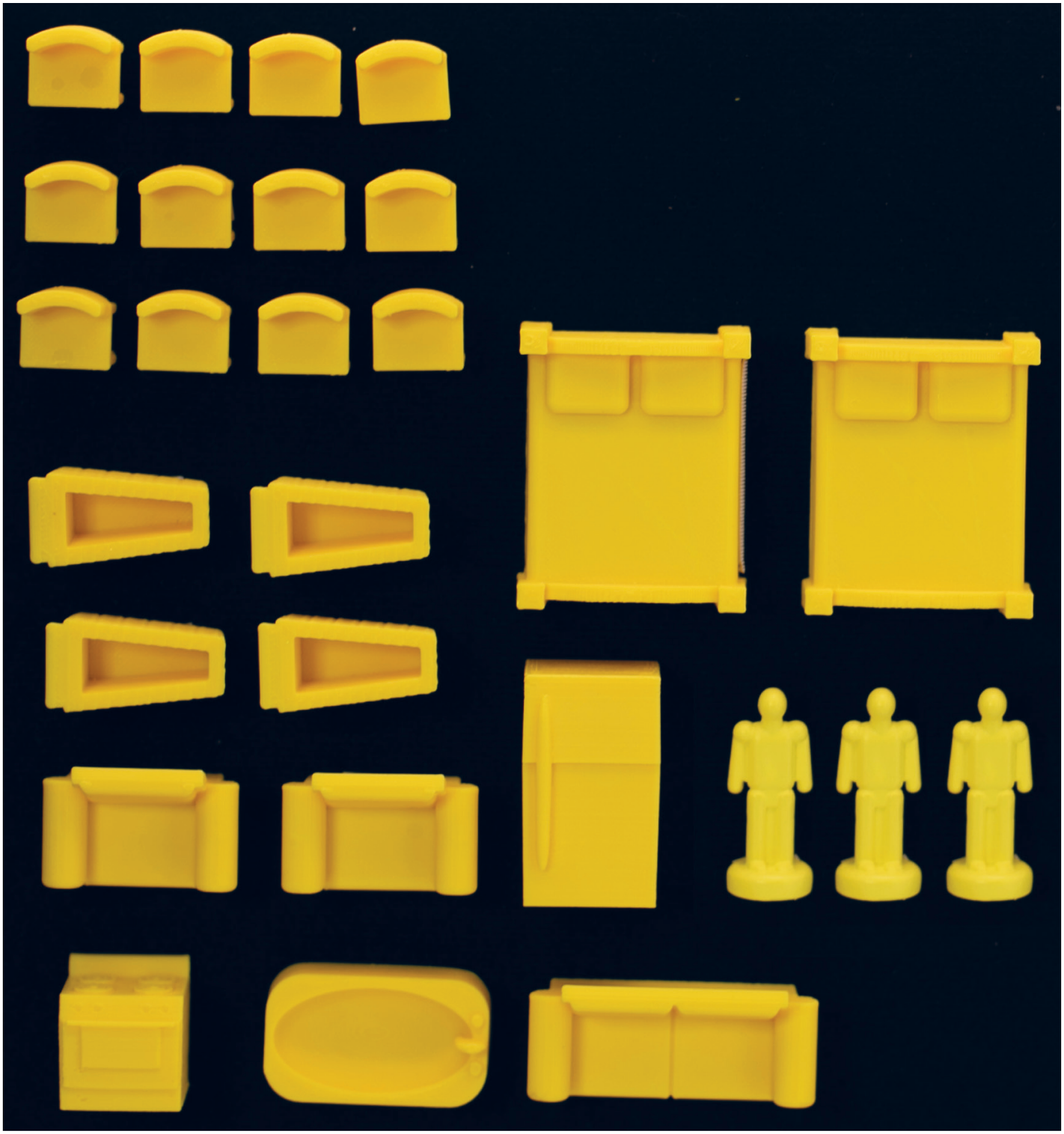
  (8) large bookshelves/grocery shelves

  (12) school desks



Yellow group

(1) couch/sofa
(1) bathtub
(1) stove
(1) refrigerator
(2) armchairs
(2) beds
(3) human figures
(4) shopping carts
(12) curved-backed chairs



Red group

(1) fireplace

(1) round table

(1) curved service desk

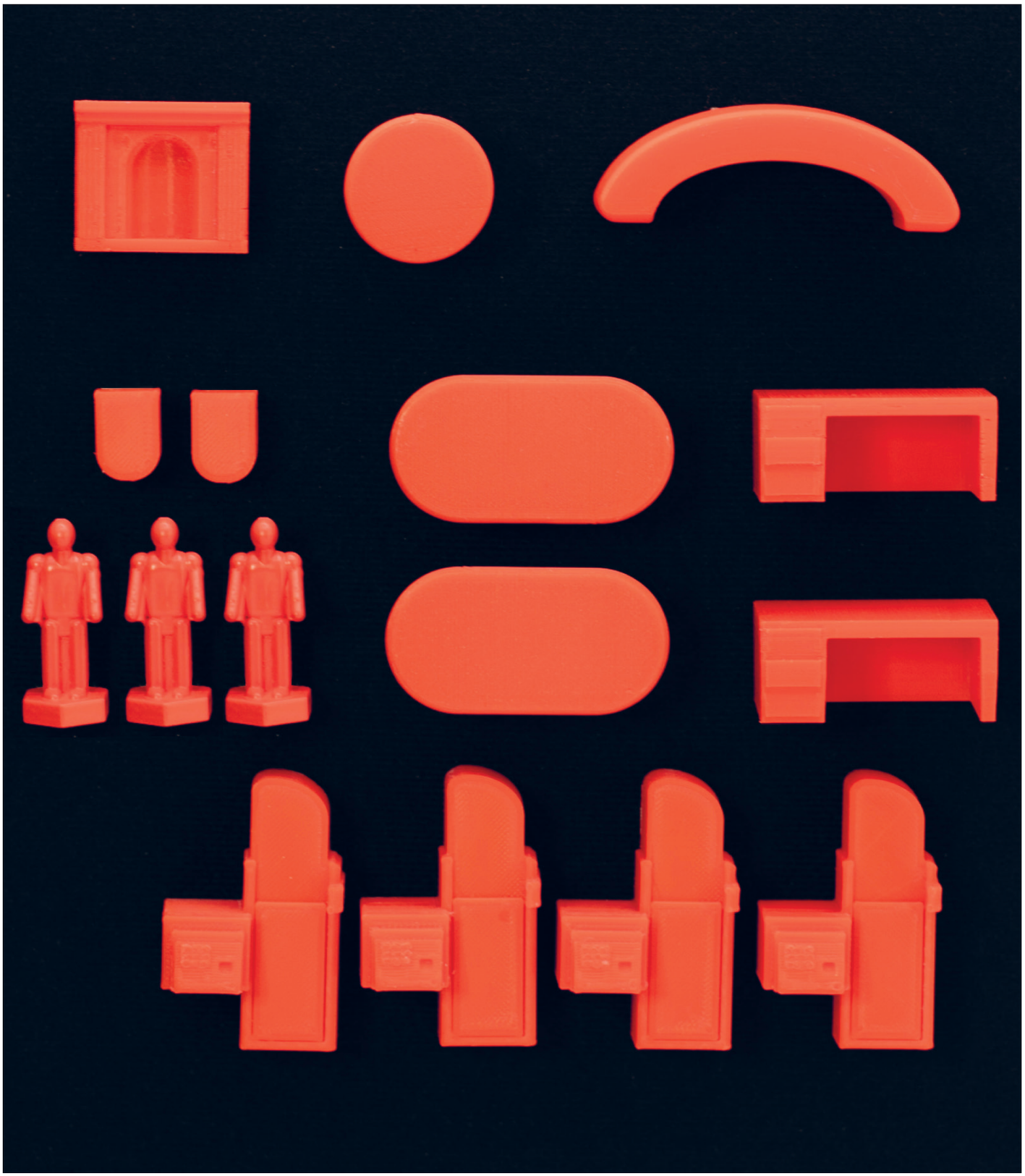
(2) end tables

(2) oblong tables

(2) office desks

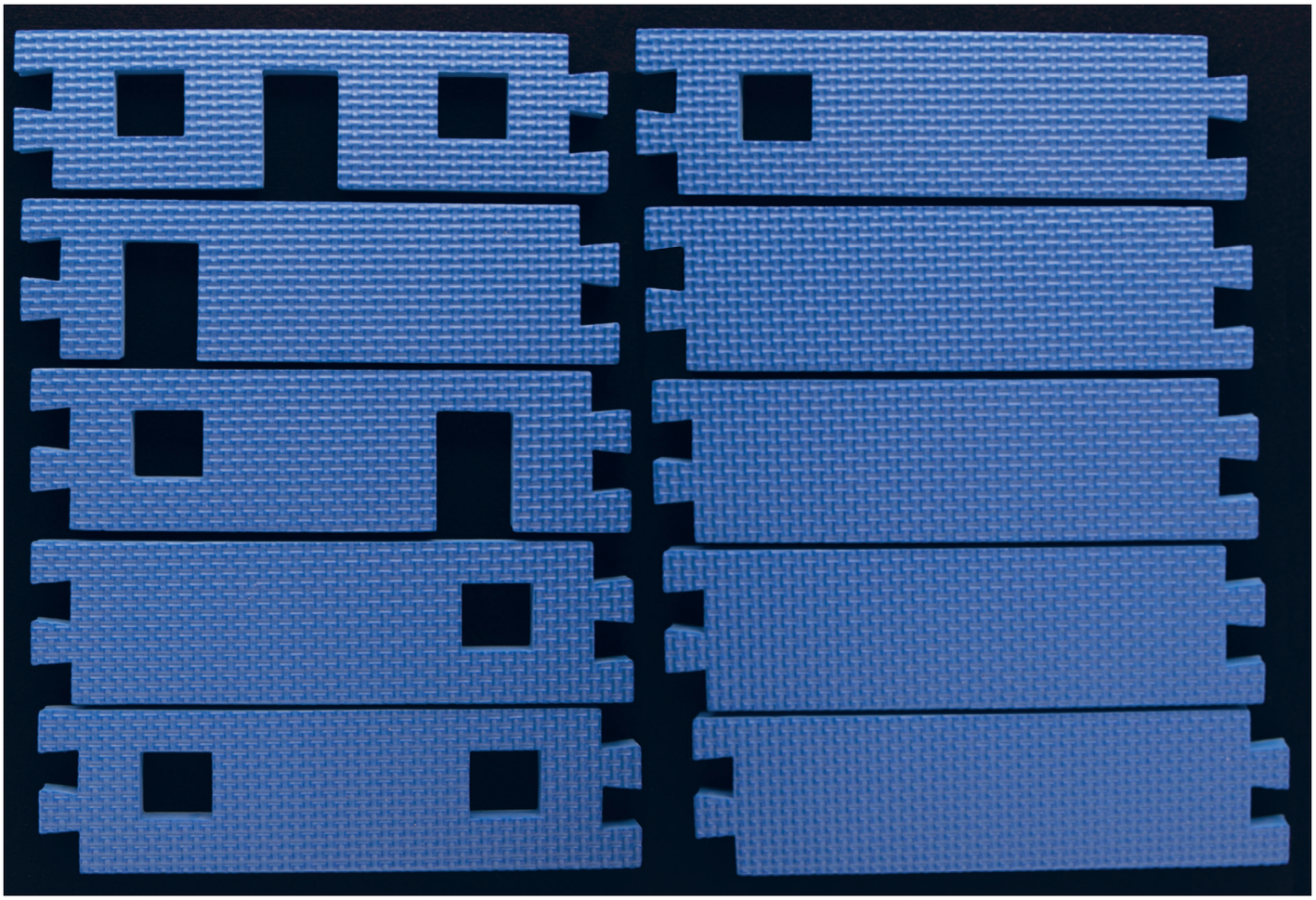
(3) human figures

(4) checkout counters

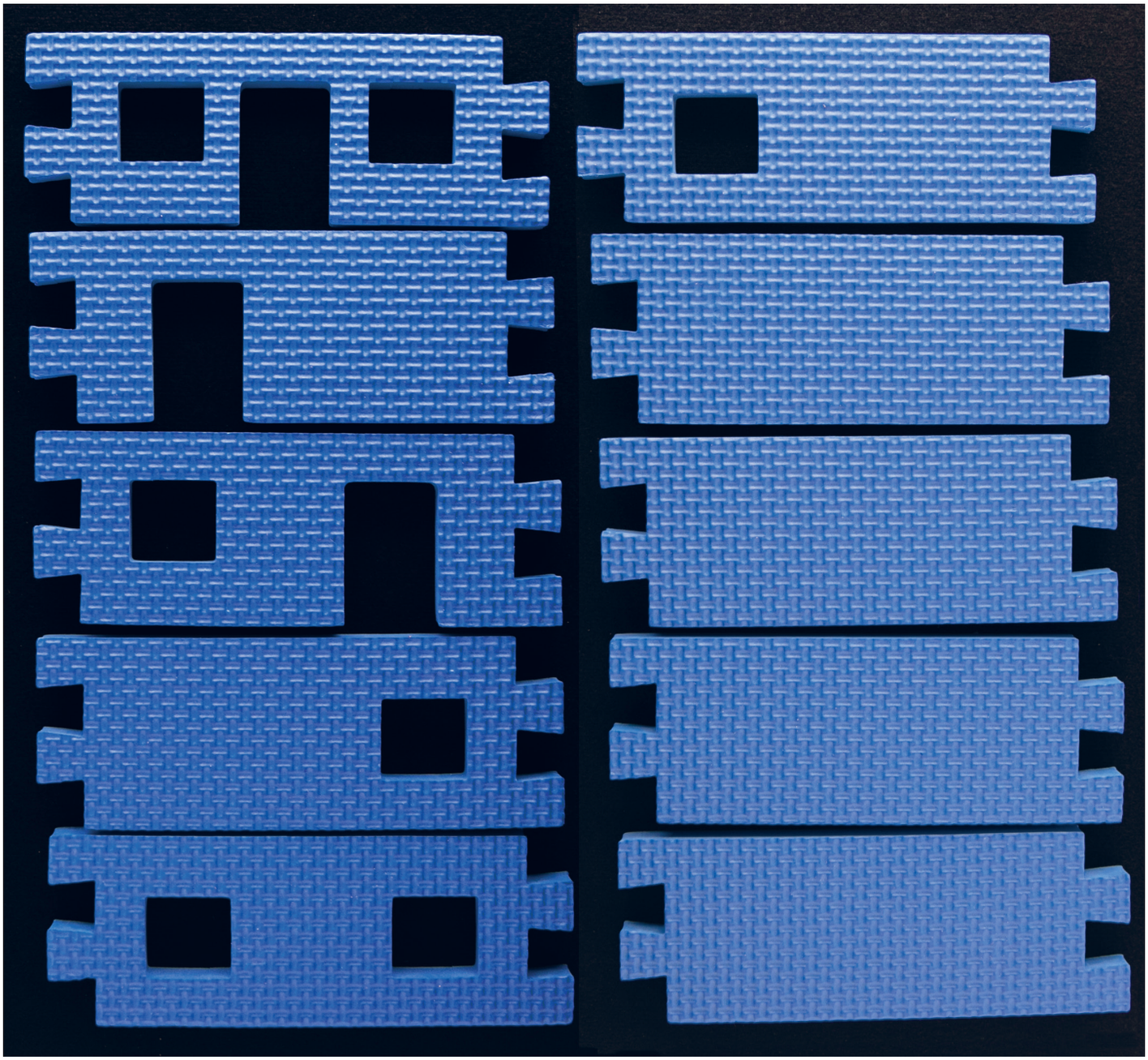


- Interlocking blue foam walls

  (10) 7.5-in. long walls with different door and window configurations



(10) 5.5-in short walls with different door and window configurations



Available door/window configurations for both long and short walls include the following with the textured "exterior" side of the wall facing toward the user:

◇ door between two windows

◇ door on left side

◇ window on left and door on right

◇ window on right side

◇ two windows

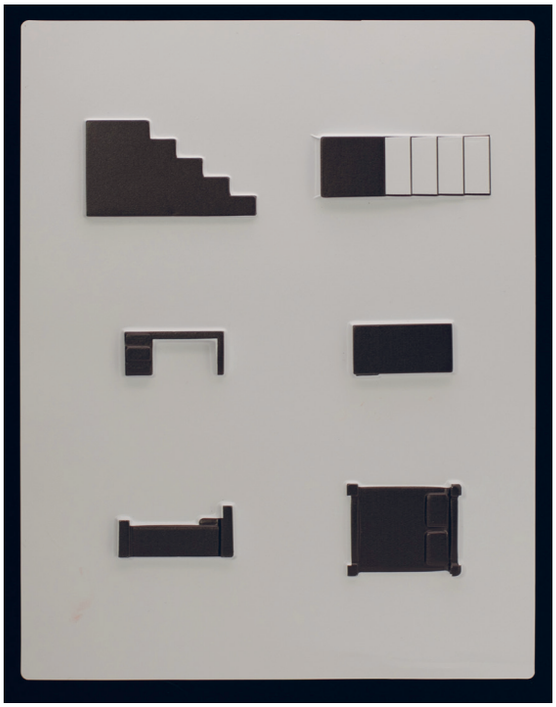
◇ window on left side

◇ solid walls without windows or doors (4 total)

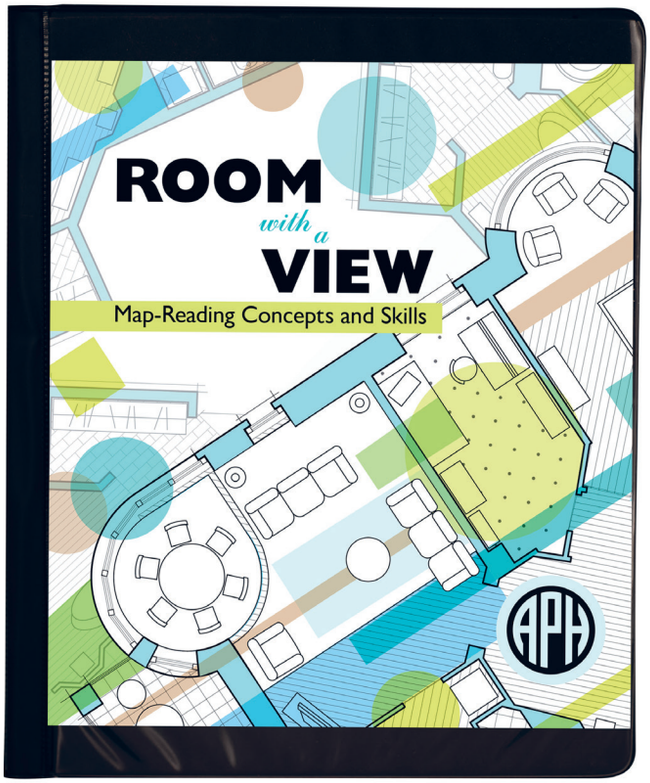
- (1) Roof with chimney

- (1) Ceiling (flat white square)
- (13) 2D Room layouts (tactile/print)

- (1) Perspective tactile/print layout with top view and side view of the staircase, office desk, and bed



- (1) Bi-fold Felt Board



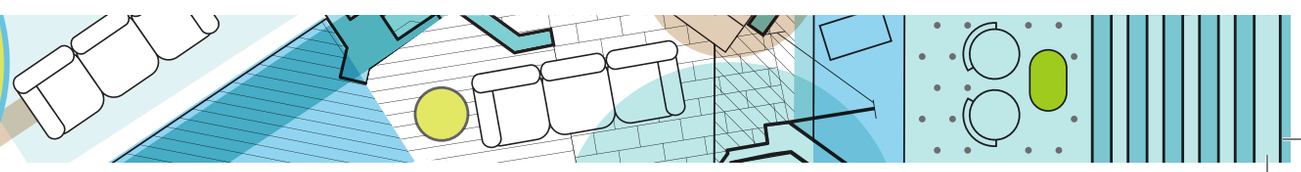
- (1) Adhesive-backed sheet of white low-profile hook material
- (1) Activity Booklet (print version). A free download BRF of the braille version of this booklet is available on the APH website.
- (1) Carrying/storage box with handle

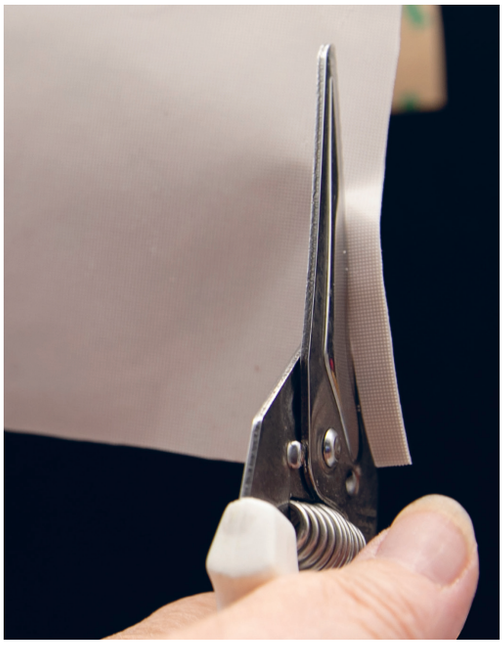
Assembly Instructions

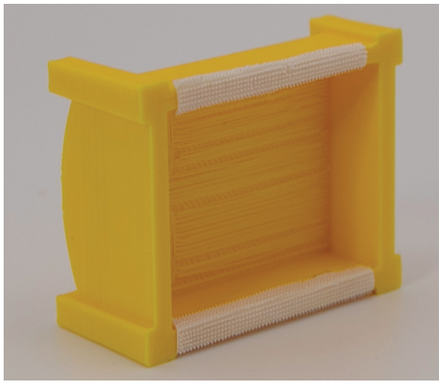
Minimal assembly is required before using **Room with a View** with students for the first time. A large sheet of adhesive-backed white low-profile hook material is provided in the kit to be used on the walls and models. *Wait 24 hours after application to ensure ideal adhesion of the hook material to the walls and 3D models*. Plenty of extra hook material will be left over after the required assembly. The extra hook material can be used for future re-applications, if needed. The instructor or student may also like to apply the hook material to additional 3D models they obtain on their own to expand their collection and room embellishments.

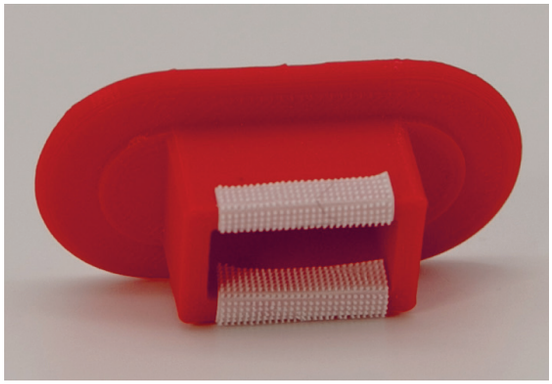
Assembly of 3D Models

Trim short strips from the provided low-profile hook sheet and apply them to the underside of all the 3D models, except the TV and computer monitor. In most cases, the trimmed hook strips will wrap around the underside edges of the 3D models as shown in the photos below. Simply remove the liner/backing from each trimmed hook strip and press the strip firmly into place. It is not always necessary to wrap all four edges of a rectangular base; applying small strips to two opposite sides/edges will provide enough hook surface to secure the piece to the felt board.

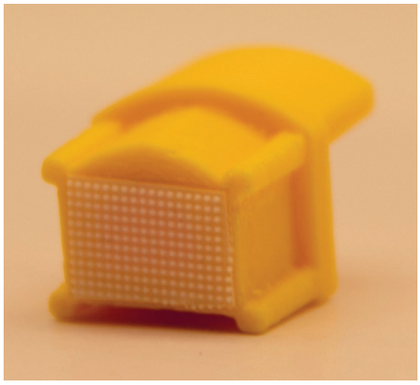


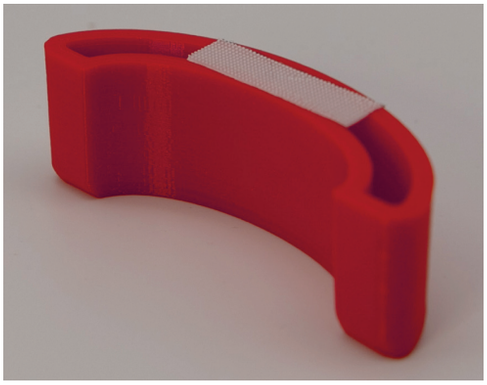




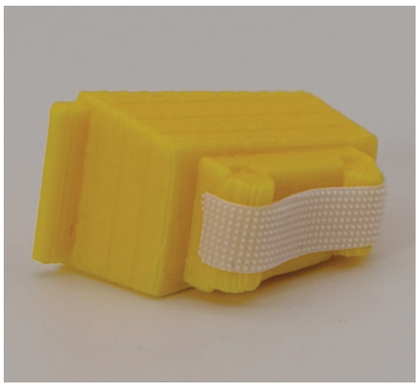


If the gap/cavity of the underside of the 3D model is narrow or small, as in the curved service desk and chairs, merely bridge the gap/open cavity with one continuous piece of hook strip.





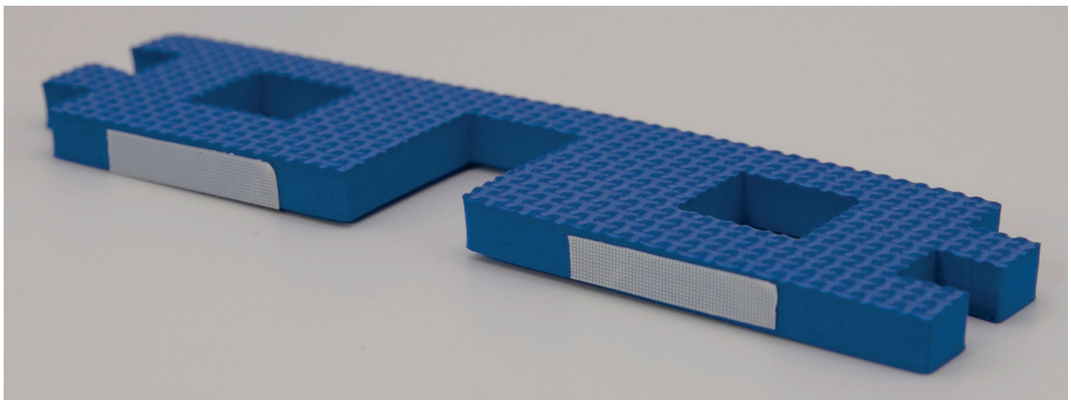
Some 3D models (e.g., bookshelf, fireplace, human figure) have a solid base, and hook strips can be trimmed and directly applied to the underside of the piece. For the shopping cart, apply a small rectangular piece of the hook material that is long enough to cover both front and back wheels.



Again, DO NOT apply the hook material to the TV or computer monitor. These parts will sit on top of a desk or other flat surface during some of the suggested activities.

Assembly of Walls

Trim and apply two short strips (approximately ½ x ¼ in.) of the low-profile hook material to the bottom edge of each blue foam wall. The textured side of the foam wall always represents the exterior wall. Be sure both sets of walls—long and short—consist of at least one wall with a single window on the left side and another wall with a single window on the right side.



If by chance you misapply any of the strips to either the 3D models or foam walls, no problem! The misapplied strips can be gently removed and replaced with new strips. You will have extra material available for multiple re-dos, if needed. Be sure to keep the leftover hook material stored flat in the carrying box.

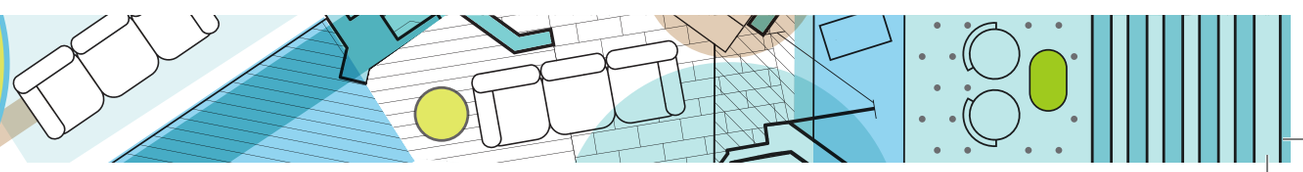
Roof and Ceiling

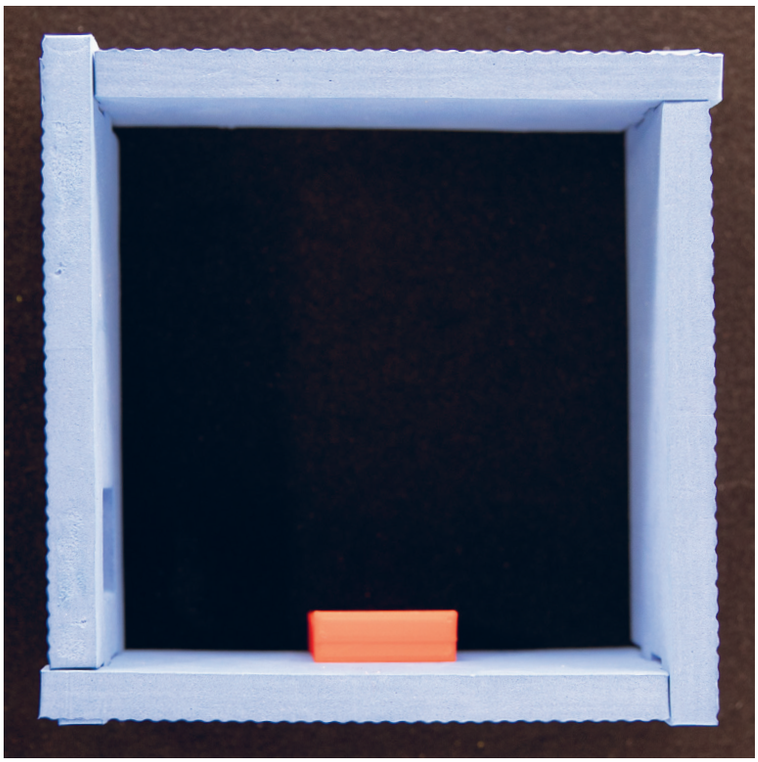
The yellow roof and white flat square ceiling are ready to use as is and do not require application of the hook material. The ceiling will rest on top of four linked long walls that form a square room arrangement. The roof will rest on top of the square ceiling.

Getting Started

Allow the student to become familiar with the various components of **Room with a View** in a relaxed and unstructured context before conducting activities suggested throughout this activity guide. For example, provide the following opportunities for casual exploration of the kit materials:

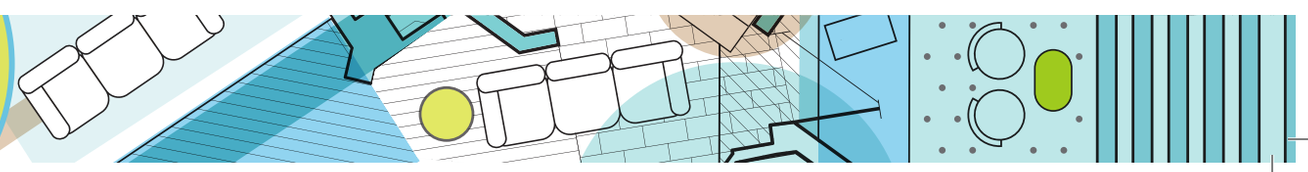
- Allow time for the student to explore the foam walls and practice linking them together. Specifically, draw attention to the notches on the opposite ends of each wall section and how these notches dovetail with notches of the other wall sections. Compare the two different lengths of foam walls, as well as the different window and door configurations (e.g., door and window, two windows, no door or window). Emphasize that the bottom of the wall is denoted by the applied hook material. The rough side of the foam represents the exterior side of the building; the smooth side represents the interior walls of the room.
- Allow time for the student to practice constructing the walls of a room directly on top of a 2D layout so that the walls are centered on top of the wall lines. In the 2D layout, furniture and other room features are slightly spaced away from the tactile wall lines so that they can be tactually recognized; wall lines are clearly defined as well without interference from surrounding room features. After the walls are linked together and corresponding 3D models are added, the room features (e.g., bookshelf, fireplace, kitchen sink) will be flush against or closer to the walls.





- Allow time for the student to explore the shape and texture of the ceiling and roof. The ceiling is a flat square piece that rests on the upper edges of four 7.5-in. foam walls linked together to form a square room. The student can practice placing the ceiling on top of the walls and then placing the roof on top of the ceiling. The roof has a chimney and an interesting shingle texture. The white ceiling and yellow roof provide visual contrast against the blue walls.
- Allow time for the student to explore the various 3D models. A student might easily identify some of the items (e.g., bed, table) at first "tactile" glance. Other 3D room pieces may be unfamiliar or unrecognizable to the student for various reasons, such as the dramatic shift in scale or shape, the student's limited firsthand experience with the actual structure (e.g., checkout counter), or dissimilarity to the furniture style encountered in the student's own home (e.g., sofa or end table). Give time for the student to make needed connections between the real item and the 3D model. For younger students, this may take more attention and guidance.

- Allow time for the student to compare each 3D model with a real-life counterpart (if available) and describe the differences. For example, some sides of furniture are unavailable or hidden from visual and tactile view, such as the back of a couch or two sides of a refrigerator that is positioned in the corner of a kitchen. Discuss features that don't move on some of the 3D models but move on the real-life equivalents (e.g., wheels of a shopping cart, toilet seat lid). Also, compare and contrast textures between the 3D models and the real-life equivalents. For example, real sofas and beds are soft and not rigid like the 3D models.
- Allow time for the student to practice transferring assembled 3D models to the felt board, paying attention to the hook material that denotes the underside of each model. Discuss other tactile cues that help identify the front and back views of each piece (e.g., back of a chair, top of a bookshelf, front of a stove, landing of stairs, etc.).
- Allow time for the student to explore simple room layouts such as Layout 1: Tables and Chairs and Layout 2: Kitchen. Then continue to introduce more complex room layouts that involve lots of furniture pieces, multiple rooms, or settings that are more familiar to the student (e.g., classroom, bedroom). Although the layout chapters are presented in a progressive manner throughout this activity guide (from simple to complex), the instructor is encouraged to introduce the room layouts in a different order based on the student's instructional needs, interests, or skill level. The 2D layouts provided are merely a starting point. Additional room scenarios should be created by the instructor or student that have personal meaning to one's own physical surroundings.



LAYOUT 1

Table and Chairs

RWAV Materials

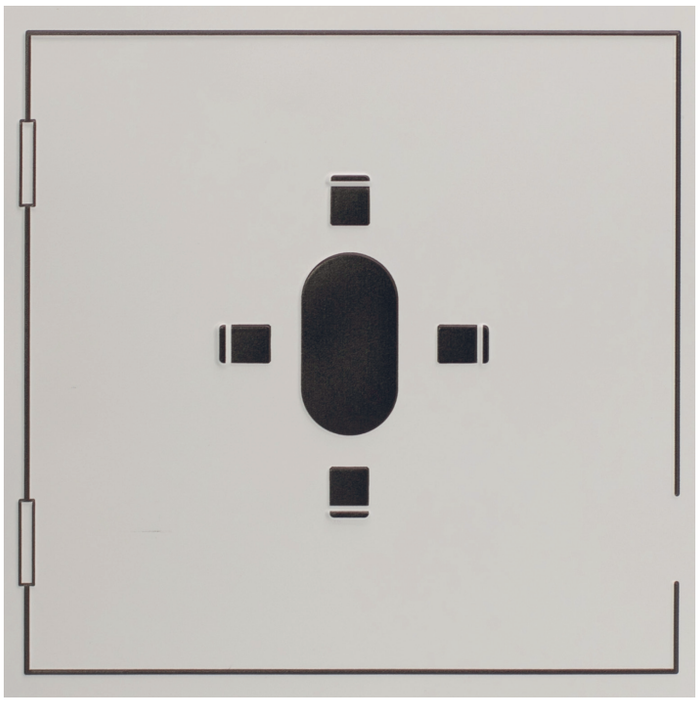
- 2D Layout 1
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- roof
- ceiling
- (1) oblong table
- (4) straight-backed chairs
- (1) human figure
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

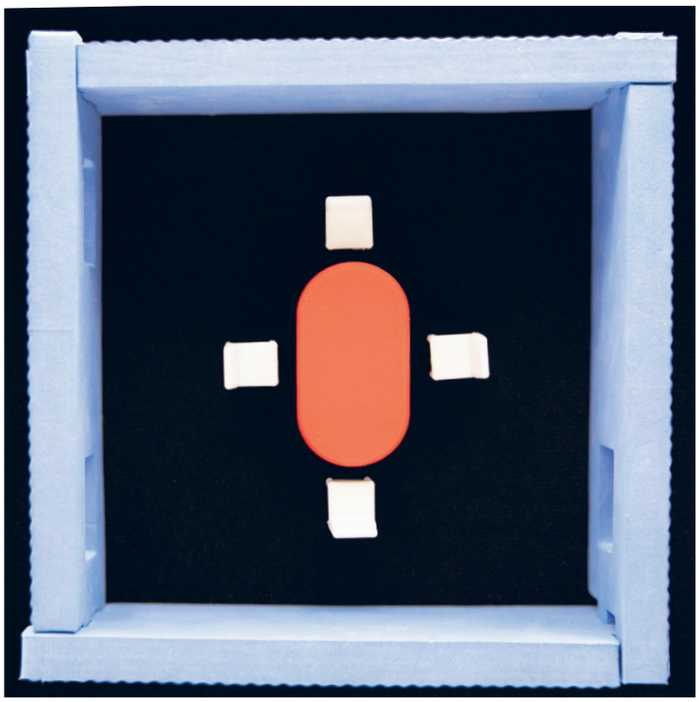
Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. Have the student notice that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows of the foam walls should match those represented in the 2D layout. Remember that the textured side of

the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Assistance may be needed until the student becomes successful in matching the 3D foam walls with the 2D representations.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Emphasize that each shape within the 2D layout represents the top view of each piece of furniture. The underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.





Focusing on Details

Have the student notice that the back of each straight-backed chair is represented by a slightly separated raised line that sits higher than the raised square shape that represents the chair seat. From a top-view perspective, the back of the 3D chair is taller than the chair seat itself. The separated line assists in identifying the directionality of each chair within the room layout.

Discuss why the 3D table is represented by an oblong raised surface within the 2D layout. From a top-view perspective, only the table's upper surface is visible and touchable; the base of the table is hidden.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the chair that is *closest to* the windows.
- Locate pairs of chairs that are *opposite* from each other.
- If the door entrance is on the *east side* of the room, then on which side of the room are the windows located? (*west*)
- Locate the window directly *opposite* the door.
- Locate the table in the *center/middle* of the room.

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

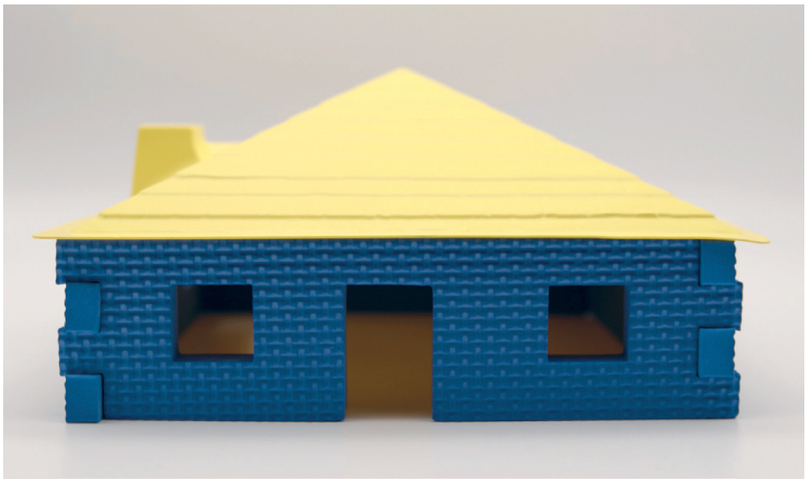
- Place a chair in the *corner* of the room.
- Place a chair *in front of* a window.
- Place a chair *outside* the *entrance* to the room.

- Place a chair *between* two windows.
- Position a person *beside* the table.
- "Walk" the person *around* the table.
- "Walk" the person *towards* the door.
- "Walk" the person *through* the entrance.
- Place the table *against* a wall *without* windows.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Add the ceiling and roof to the top of the 3D room layout and allow the student an opportunity to explore the structure. The ceiling will rest on the upper edges of the four 7.5-in. linked foam walls. In turn, the roof will rest on top of the ceiling. Emphasize that when the roof and ceiling are removed, a top-view or "bird's-eye" view of the room is shown. The side, front, and back views of each furniture piece are not captured in the 2D layout. Consequently, the four chair legs and the base of the table are not tactually or visually available from a top-view perspective.



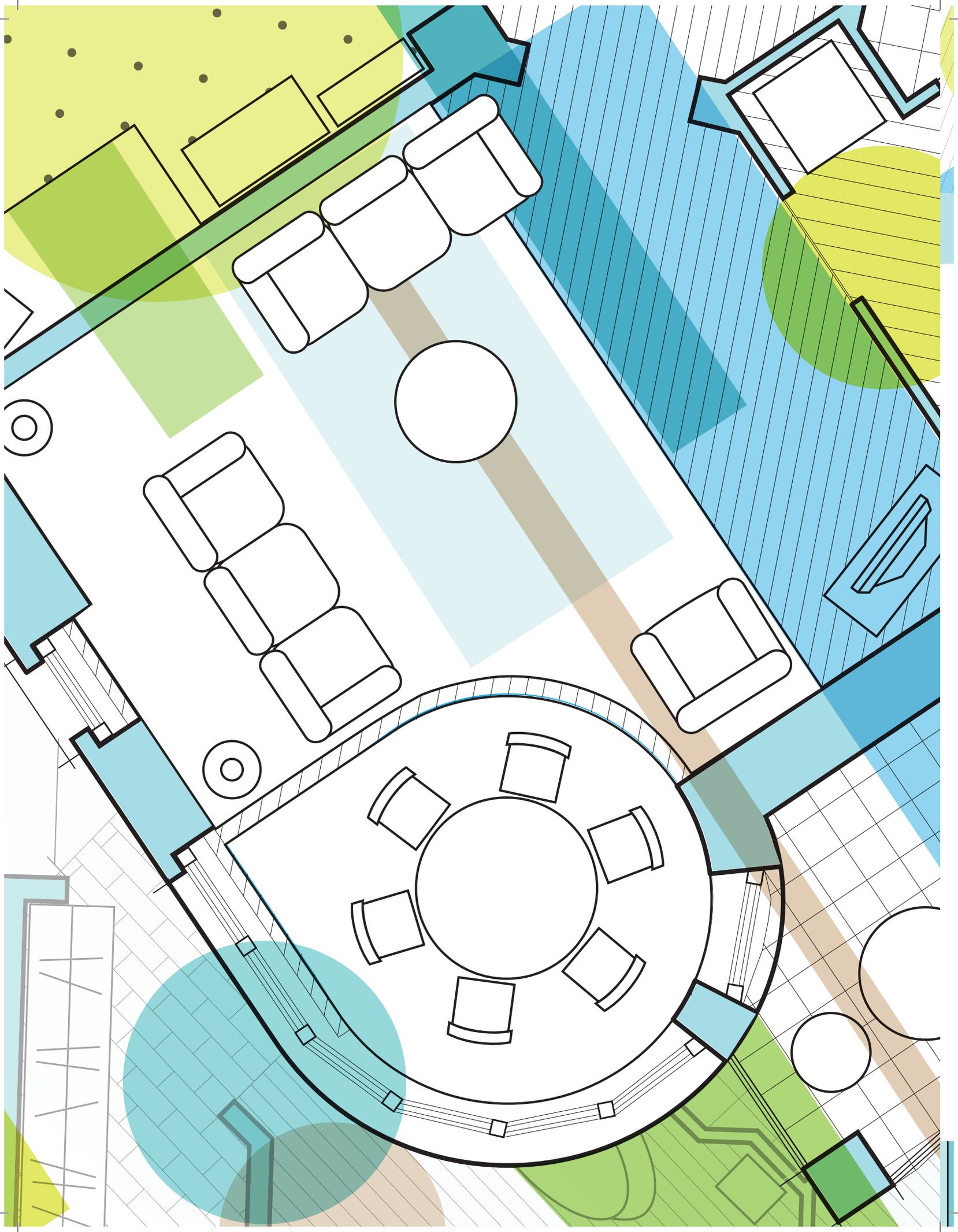
Creative Approaches

The student should be exposed to other types of tactile maps. Encourage the student to create a similar room layout as shown in Layout 1 using other tactile drawing tools and materials, such

as APH's Picture Maker or DRAFTSMAN. Have the student practice drawing tactile lines to represent walls and basic outline shapes (e.g., circles, squares, triangles) to represent furniture pieces.

Real Room Experiences

Duplicate the room layout using real chairs and a real table. Practice spatial concepts and skills using the furniture arrangement. For example, ask the student to move a chair to the *corner* of the room, walk *around* the table, place chairs *opposite* each other, and so forth.

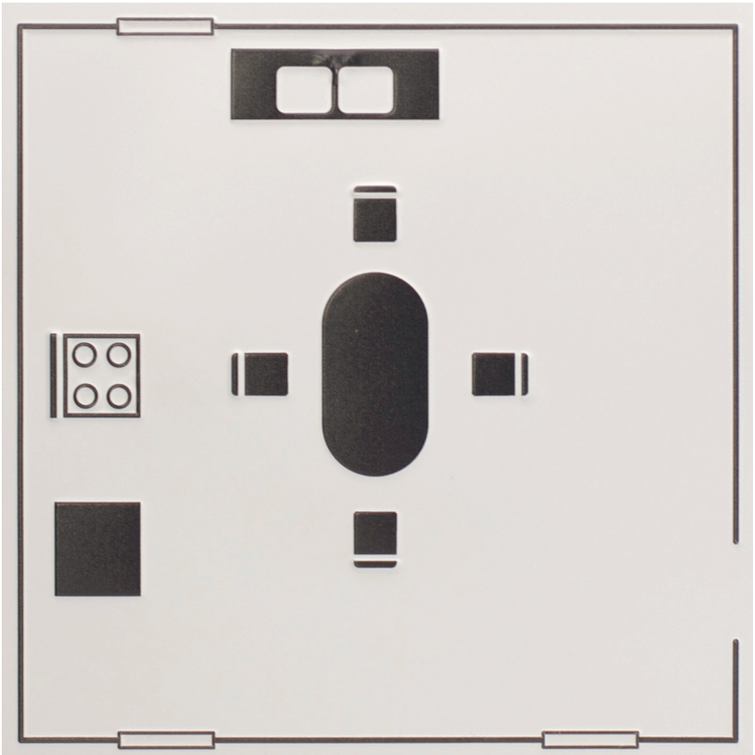


LAYOUT 2

Kitchen

RWAV Materials

- 2D Layout 2
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- roof
- ceiling
- (1) oblong table
- (1) kitchen sink
- (1) stove
- (1) refrigerator
- (4) straight-backed chairs
- (2) human figures
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

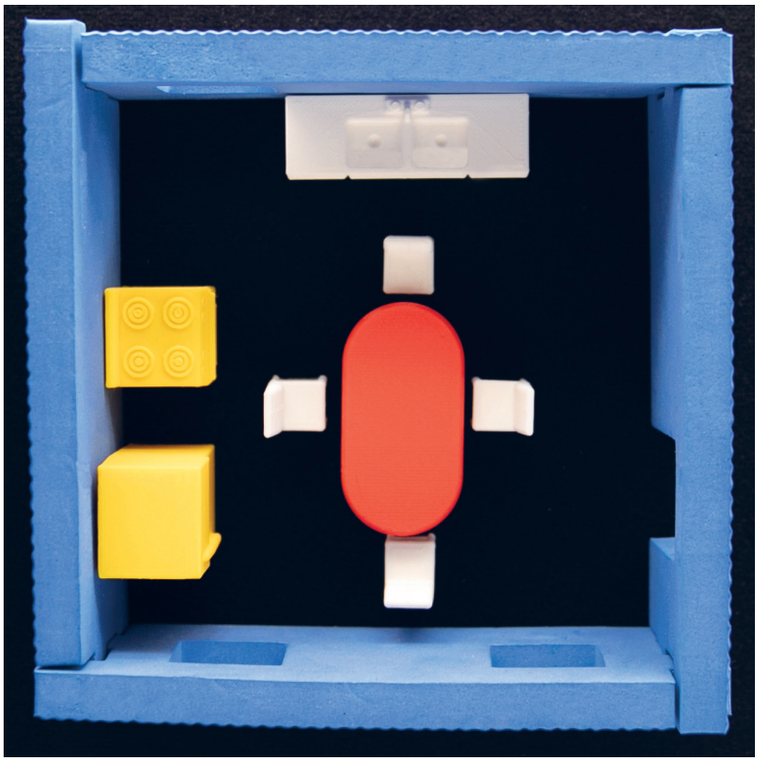


Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows of the foam walls should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Emphasize that each shape within the 2D layout represents the top view of each piece of furniture or room feature. The underside of each 3D model will have hook material that will assist

with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

Have the student notice the orientation line associated with each small straight-backed chair within Layout 2. The back of each chair is represented by a raised line that sits higher than the raised area that represents the chair seat. The separated line assists in identifying the directionality of each chair within the room layout.

Have the student compare Layout 1 and Layout 2 and identify the room features that have been added to the layout—e.g., refrigerator, stove, and the kitchen sink (with two basins).

Have the student compare Layout 1 and Layout 2 and identify changes in the number and position of windows.

Have the student notice that the side-by-side sink basins in the 2D layout feel like recessed or sunken areas within the raised rectangular surface. These basins are deeper in the actual 3D model. The sink faucet in the 2D layout is represented by a short tactile line that sits at a higher elevation so that it is more tactually prominent.

Have the student notice that the refrigerator is represented as a simple square surface within the 2D layout; it represents the top surface of the refrigerator. Emphasize that the handle-side of the refrigerator is positioned away from the wall. The 3D model has a long, raised handle that indicates the front of the refrigerator.

Have the student notice that the back of the stove within the 2D layout is indicated by a slightly separated, higher tactile line; it conveys the direction the stove is facing within the room. Draw attention to the tactile circles that represent the four burners of the stove.

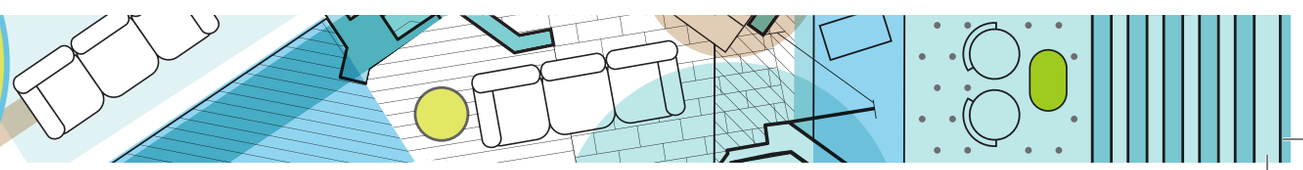
⚠ WARNING:

This is an ideal time to explain critical safety precautions regarding stoves to young children, especially the importance of NOT touching the top of a real stove or inside of an oven. Discuss why this is important—to avoid serious burns and injuries. While it is important to know where a stove is located in relation to other appliances within one's own kitchen for orientation purposes, ONLY an adult should ever operate/touch a real stove or oven.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the table in the *center/middle* of the kitchen.



- Locate the two kitchen appliances that are on the *same side* of the kitchen.
- Locate pairs of chairs that are *opposite* each other.
- If the door entrance is on the *east side* of the room, then which *side* of the room is the refrigerator and stove? (*west*)
- Locate windows directly *opposite* each other.
- Identify the chair that is *farthest from* (or *nearest to*) the kitchen sink.
- Locate the *side* of the room that only has one window.
- Locate the kitchen appliance directly *across from* the door entrance.

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- Face a 3D person *toward* the kitchen sink.
- Position a 3D person *beside* the chair that is *nearest to/closest to* the stove.
- Position two chairs *against* the wall with two windows.
- Move the refrigerator to the *corner* of the room without a *nearby* window.
- "Walk" a 3D person *through* the door entrance to the *outside* of the room.
- Position two 3D persons *across* the table from each other.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Rotate the 2D room layout so that the kitchen sink is on the side

closest to the student. Have the student use spatial terms to describe the room layout from a different perspective—for example, the stove and refrigerator are on the *right*; the wall with two windows is on the *opposite side* of the room; and the doorway is located on the *left side* of the room, etc.

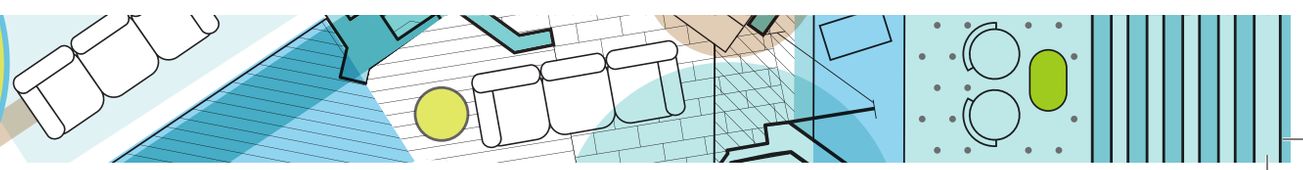
Creative Approaches

Explore and discuss other common features within many kitchens (e.g., dishwasher, pantry, cabinets, countertops). Arrange the 3D room layout to more closely resemble the kitchen layout that the student typically experiences. Embellish it with other hook-backed shapes (e.g., geometric shapes from APH's Picture Maker kit) to represent the location of other kitchen appliances and furniture.

Allow the student to independently create a model of their own kitchen (or another familiar kitchen) using an interactive drawing kit (e.g., Picture Maker) or drawing board (e.g., TactileDoodle). This is a good time to emphasize to the student that a simple shape will often symbolize a real object within a map; the shape will frequently lack many of the physical characteristics of the real object (e.g., actual shape, texture, movable parts).

Real Room Experiences

Emphasize that the layouts of kitchens vary greatly from one home to another, as well as the type and design of kitchen appliances, tables, and chairs. If possible, allow the student, in the company of an adult, to safely explore and compare a variety of kitchens. For example, compare kitchens that include an eating area with those that have a separate dining room; explore a kitchen with a center island that you can walk around; compare kitchens that have a U-shape versus an L-shape cabinet arrangement; etc. Count the number of cabinet doors on the 3D model kitchen sink. How many cabinets does the student count within the real kitchen?

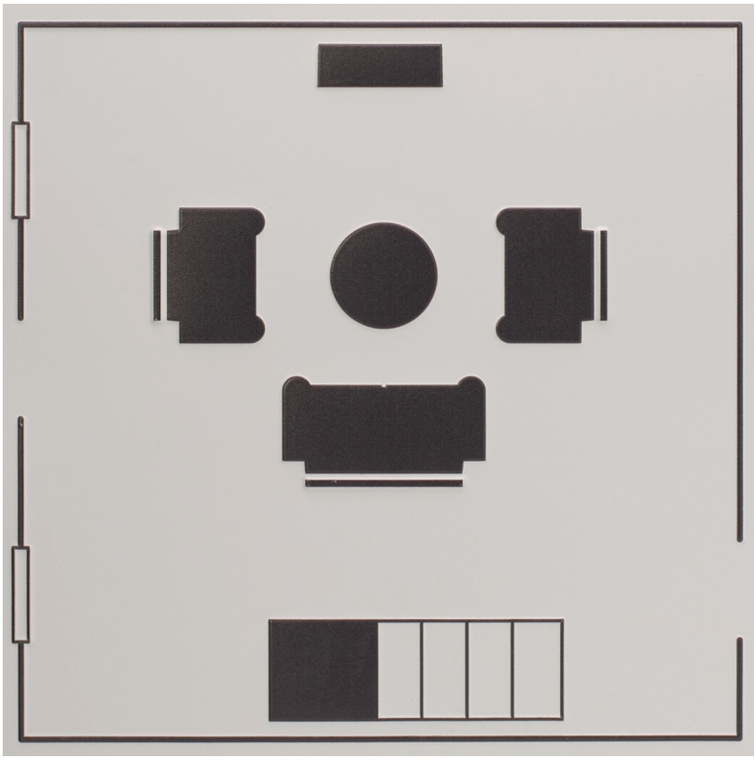


LAYOUT 3

Living Room

RWAV Materials

- 2D Layout 3
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (1) round table
- (1) couch/sofa
- (2) armchairs
- (1) fireplace
- (1) staircase
- (2) human figures
- (1) flatscreen TV
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

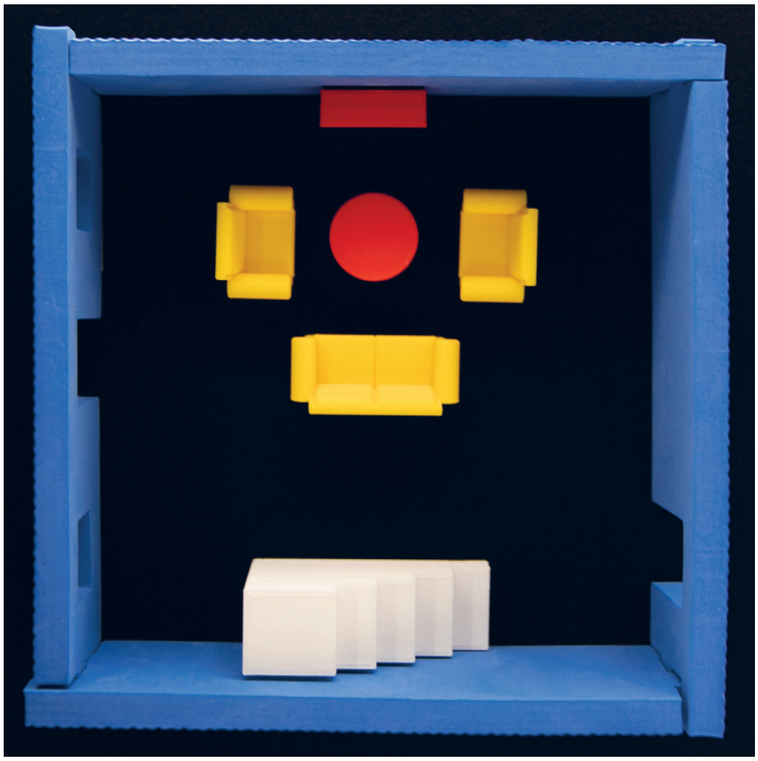


Initial Orientation/Setup

Using the 2D room layout as a reference construct the walls of the 3D room on one half of the felt board. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows of the foam walls should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Emphasize that each shape within the 2D layout represents the top view of each piece of furniture or room feature. The

underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

Have the student notice the orientation lines associated with the sofa and armchairs within Layout 3. The higher back of each armchair and sofa is represented by a raised line that sits higher than the raised area that represents the seat cushion of the sofa or armchair. The separated line assists in identifying the directionality of the sofa or armchair within the room layout. The arms of the sofa and armchairs are slightly rounded to provide an additional directional cue.

Have the student notice the different lengths of the sofa and armchairs. Although they are similar in shape, the sofa is noticeably longer than the armchairs.

Have the student compare the circular/round table surface to that of the oblong table encountered in Layouts 1 and 2. Are the shapes representing the two tables from a top-view perspective within the 2D layouts easy to discriminate?

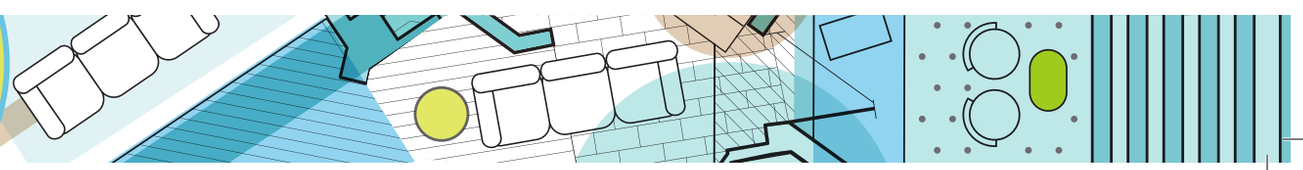
The top view of the fireplace is represented by a raised rectangular shape. The shape is the same size as the top of the fireplace model. Have the student examine the 3D model of the fireplace and indicate features not captured in the 2D representations, such as the concave area, overhanging mantle, decorative details, etc.

Have the student compare the 3D model of the stairs to its tactile representation within the 2D layout. The shift from 3D to 2D is significant. In the 2D layout, individual steps, including the landing, have been collapsed or flattened to the same level. The landing is represented by a solid rectangular shape; the individual steps are separated by thin raised lines; this solid shape will assist the student in recognizing the direction the stairs are facing within the room.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate a doorway that is *between* two windows.
- Locate the window that is *opposite* a doorway.
- Is the sofa facing *toward* or *away from* the fireplace?
- Locate the armchair that is *to the right* of the sofa.



- If the fireplace is on the *north side* of the room, where are the stairs located? (*south side*)
- Locate the armchair *nearest to* a window.
- Describe the location of the round table within the room. (*between* two armchairs, or in the *center* of the sofa and armchair arrangement)
- "Walk" the stairs using a finger from the *bottom* step to the *top* of the landing.

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- "Walk" a 3D person *up* or *down* the stairs.
- "Walk" a 3D person from the *bottom* of the stairs *toward* the *closest* doorway.
- Have a 3D person *enter* the room *through* one doorway and *exit* the room *through* the doorway on the *opposite side* of the room.
- Face the sofa *away from* the fireplace.
- Position a 3D person *between* the fireplace and the table. Place another 3D person *behind* the sofa.
- Place the two armchairs *adjacent to* or *side-by-side*.
- Place an armchair *diagonally* in a corner *near* a window.
- Have the student embellish the 3D layout of the living room based on the instructor's verbal directions. For example, add a bookcase *to the right* or *left* of the fireplace; place the TV *on top of* the fireplace mantle; add two small chairs *opposite* the sofa, etc.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Position a 3D person at the top of the staircase. Explain that in this position, the person is looking *down* upon the living room from a top-view perspective. They are on a level or floor *above* the living room.

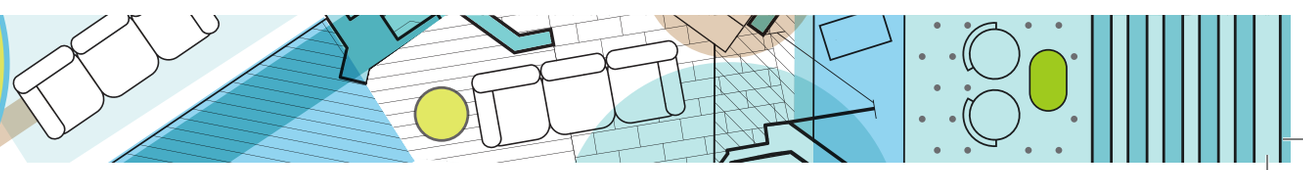
Use the stairs in the 3D layout to practice ordinal position as the 3D person descends the staircase—1st step, 2nd step, etc.

Intentionally teach the concept of rotation by having the student turn the 2D or 3D layout *clockwise* or *counterclockwise* 90 or 180 degrees. After each rotation, have the student describe the position of the furniture pieces from a different perspective. For example, have the student locate the room features *farthest from* and *nearest to* them.

Use the Perspective layout to demonstrate the top-view and side-view perspectives of the stairs. The tactile relief of the stairs sits higher and is more detailed than that in the 2D layout of the living room. Have the student orient the 3D model of the stairs to match each view shown in the Perspective layout.

Creative Approaches

Allow the student an opportunity to re-create the same top-view perspective shown in Layout 3 using other tactile drawing media such as APH's Quick-Draw Paper, DRAFTSMAN, or Picture Maker. The room drawing can also be made using commercially available collage materials, waxed yarn, magnetic pieces/shapes on a metal board, etc. Compare and contrast the student's drawing with the 2D layout. What changes did the student need to make to the tactile



design? Compare and discuss the differences between the 2D layout and the student's design. Although the styles might be different, the same room arrangement is conveyed. This is an excellent time to emphasize to the student that not all tactile maps are constructed in the same way or feel alike. Some have multiple contrasting textures, while others consist mostly of raised shapes and outlines.

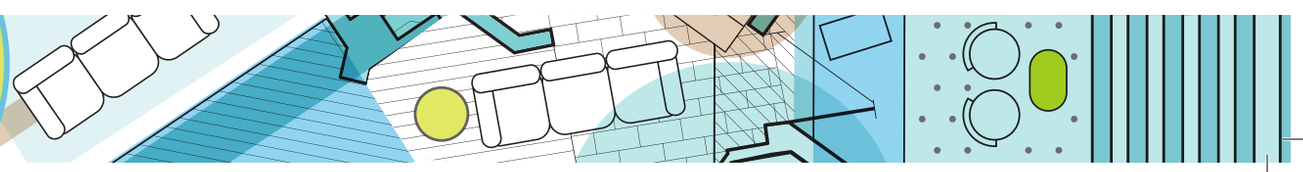
Real Room Experiences

Emphasize the dramatic shift in the size from real living room features/furniture to the 3D models—chairs, sofas, fireplace, and stairs. Discuss other differences such as the number of steps, shapes of sofas and chairs, fireplace style, etc. Many features are forfeited in the 3D models for the sake of simplicity. Representative shapes within 2D tactile maps are usually simplified as well. For example, a rectangular raised outline can represent a couch, or a raised outline circle can represent a table.

Have the student compare Layout 3 with an actual living room. Encourage the student to use 3D models from the RWAV kit to closely represent the furniture arrangement of the real living room. The room layout can be embellished with other hook-backed shapes (either homemade or borrowed from other APH kits). For example, a circular or square piece from Picture Maker can represent another coffee table or end table. Encourage the student to independently construct the room layout. Discuss which furniture pieces needed to be added that differ from the ones presented in the 2D layout of the living room. Are there room features in the 2D layout that are not encountered in the real living room—perhaps a fireplace or stairs? By independently creating a tactile layout of an actual room, the student will be forced to make decisions about which room features are most important to

represent within a map. The tactile 3D map, in turn, will serve as a navigational tool that is meaningful to the student.

Practice a variety of spatial concepts while the student constructs the 3D layout of a real living room. Encourage the student to use descriptive spatial terms (e.g., *behind*, *near*, *against*) as they arrange and place the room features/models in relationship to each other within the 3D map.

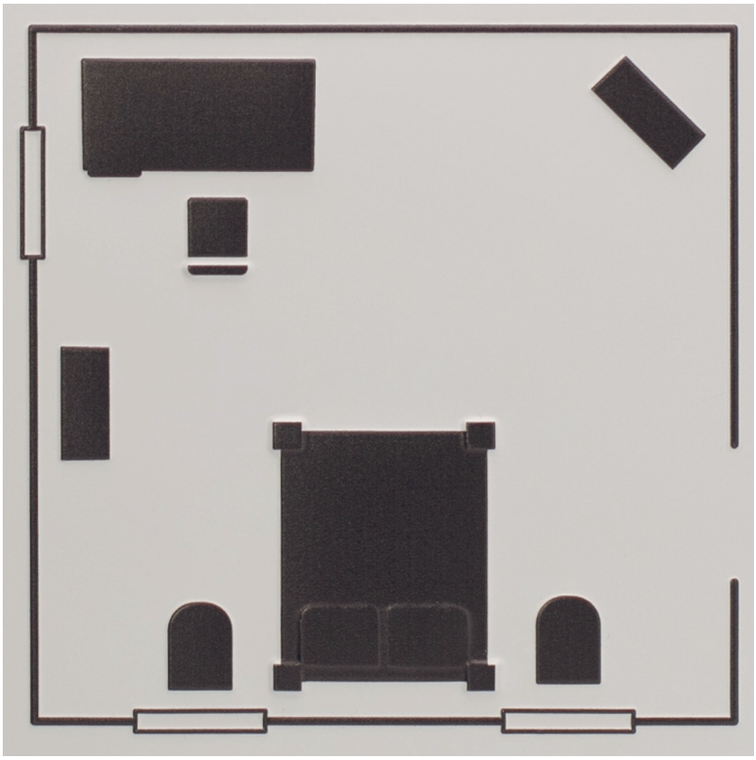


LAYOUT 4

Bedroom

RWAV Materials

- 2D Layout 4
- felt board
- (4) 5.5-in. foam (short) walls that match those in the 2D layout
- (1) bed
- (2) end tables
- (1) small bookshelf
- (1) chest of drawers/dresser
- (1) office desk
- (1) straight-backed chair
- (1) human figure
- (1) computer monitor
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

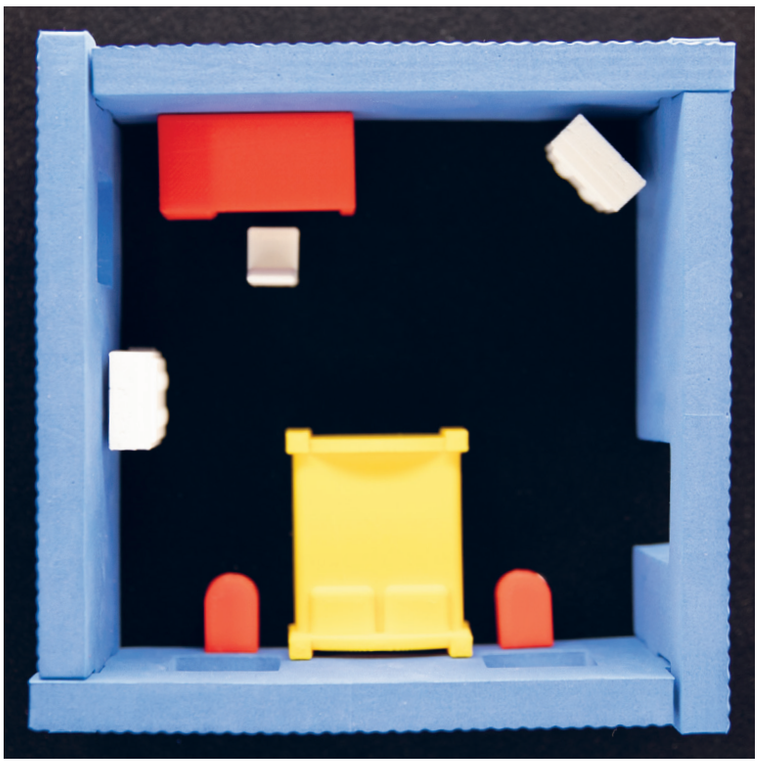


Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. *Be sure to use the short walls for this layout.* Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows of the foam walls should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Emphasize that each shape within the 2D layout represents the top view of each piece of furniture or room feature. The

underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

Have the student notice the orientation line associated with the small straight-backed chair within Layout 4. The back of the chair is represented by a raised line that sits higher than the raised area that represents the chair seat. The separated line assists in identifying the directionality of the chair within the room layout.

Have the student notice the unique shape of the two end tables within Layout 4 in combination with the 3D models. One side of each end table is curved. Explore the three straight sides and the

curved end of each end table. The curved end will help identify the table's orientation within the 2D layout.

Have the student notice the unique features of the bed within Layout 4. Compare it directly with the 3D model of the bed. Notice that the bed posts and the two pillows sit slightly higher in the 2D layout. The location of pillows at one end of the bed will help identify the bed's orientation within the bedroom setting.

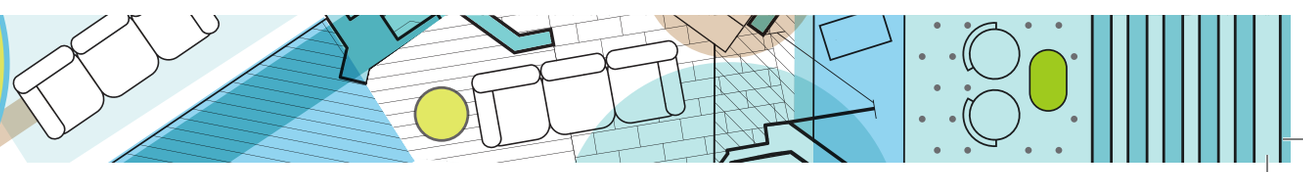
Have the student notice that the silhouette shape of the bookcase and dresser from a top-view perspective within the 2D layout are identical. There is not a right or wrong placement of these pieces within the room setting unless the instructor specifically asks the student to position one against the wall and the other within the corner of the room.

Have the student notice the rectangular shape of the top view of the desk. The middle desk drawer protrudes slightly outward from the top and bottom drawers on the 3D model. This slight drawer extension is captured in the 2D layout to help indicate directionality. Compare the top view of the desk to the rectangular shape of the large sofa and/or kitchen sink. Focus on the features that help distinguish the three pieces apart—curved arms and directional line of the sofa, separate basins of the kitchen sink, and the entirely flat surface of the desk.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the wall *without* a window or door.
- Locate the dresser (or bookshelf) in the *corner* of the room.
- Locate the dresser (or bookshelf) *next to* a window.



- Which is the *largest* piece of furniture within the room? (bed)
- Locate the end table that is *closest to* the door.
- If the bed is on the *south side* of the bedroom, where is the desk located? (*north side*)
- Describe the bed's location in relation to the end tables (*between*)
- Which piece of furniture is *closest to* the bed—the dresser or the bookshelf?
- Locate the piece of furniture that is *nearest to* the desk. (chair)
- Locate the piece of furniture that extends *farthest* into the *center* of the room. (bed)
- Is the chair facing *toward* or *away from* the desk?

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- "Walk" a 3D person *through* the doorway and *toward* the bed.
- Place the bookshelf and dresser *next to* each other and *against* the wall with only one window.
- Scoot the chair *under* the desk.
- Are the desk drawers to the *left* or *right* of the chair?
- Face a 3D person *toward* the desk.
- Place one of the end tables *beside* the desk.
- *Center* the desk *against* the wall *without* windows.
- Have the student embellish the 3D layout of the bedroom based on the instructor's verbal directions. For example, add another

bed that faces *toward* a wall with only one window, place a computer monitor *on top of* the desk, position another chair *beside* an end table, etc.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

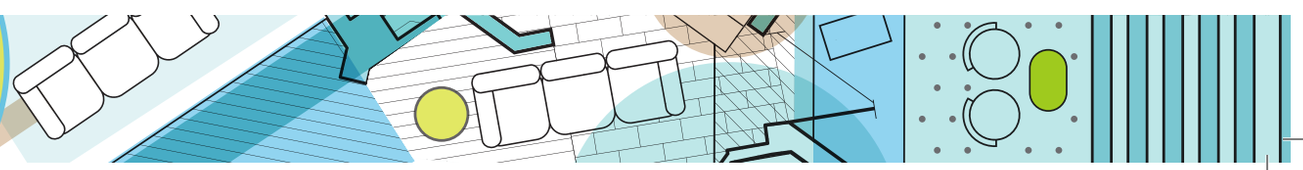
Change of Perspective

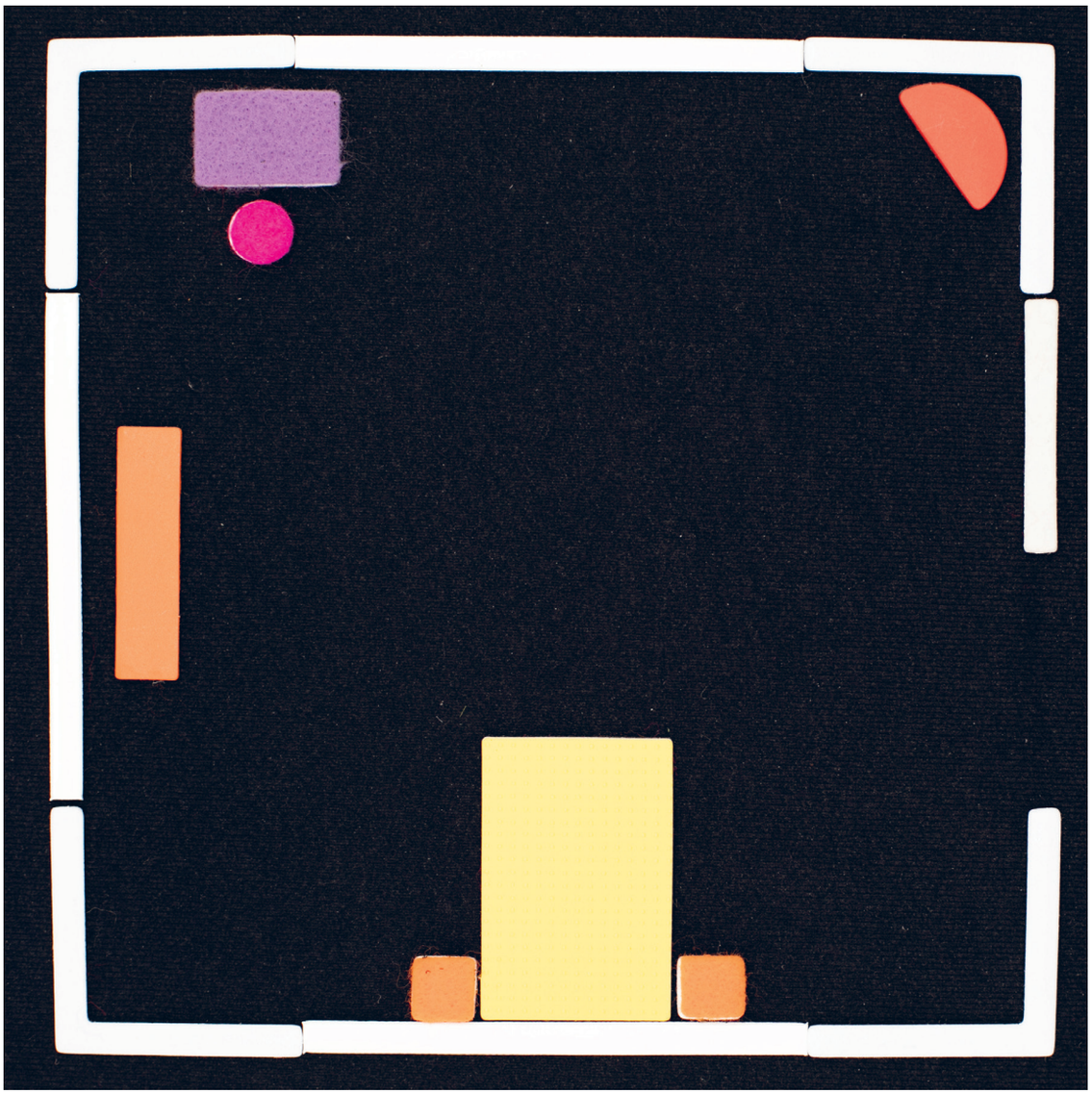
Rotate the 2D or 3D layout *clockwise* or *counterclockwise* 90 or 180 degrees, then have the student describe the position of the furniture pieces, windows, and door from a different perspective.

Use the Perspective layout to demonstrate the top-view and side-view perspectives of the bed. The tactile relief of the bed is higher and more detailed than that in the 2D layout of the bedroom. Also compare the top-view and side-view perspectives of the desk. Have the student orient the bed and desk 3D models to match each view shown in the Perspective layout.

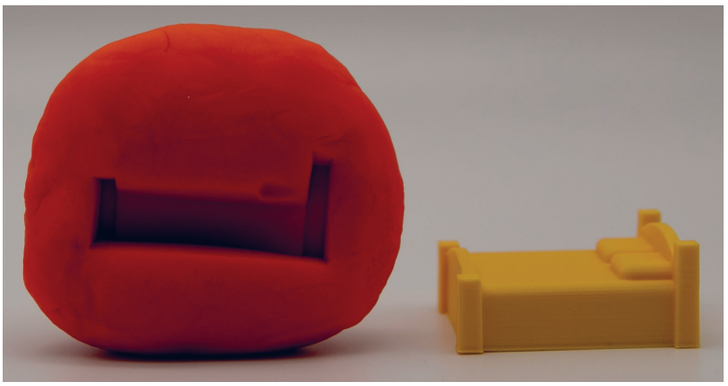
Creative Approaches

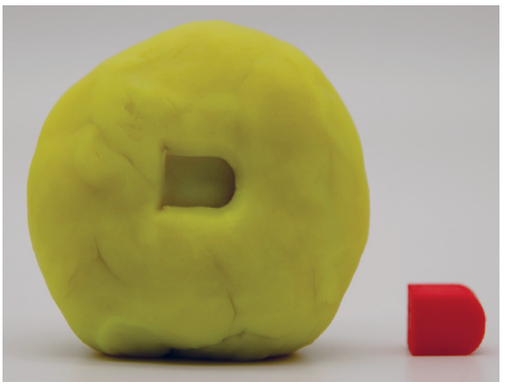
Allow the student an opportunity to re-create the same top-view perspective shown in Layout 4 using other tactile drawing media such as APH's Quick-Draw Paper, DRAFTSMAN, or Picture Maker. The room drawing can also be made using commercially available collage materials, waxed yarn, magnetic pieces/shapes on a metal board, etc. Compare and contrast the student's drawing with the 2D layout. What changes did the student need to make to the tactile design? Compare and discuss the differences between the 2D layout and the student's design. Although the styles might be different, the same room arrangement is conveyed.





Using modeling clay, have the student create imprints of the various furniture models and compare the resulting pressed shapes to those shown in the 2D layout.



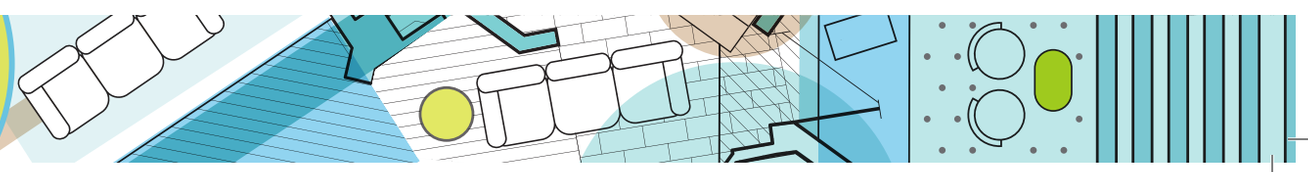


Real Room Experiences

Emphasize the dramatic shift in size from the real bedroom furniture (bed, end table, desk, bookshelf, dresser) to that of the 3D models/counterparts. Discuss other differences such as textural changes. For example, bed pillows and mattresses are usually soft/bouncy and contrast with the hard bedframe. Discuss differences between common bed styles (e.g., twin-size bed, queen-/king-size, bunkbeds, daybeds).

Ask the student to use 3D models from the RWAV kit to closely represent the furniture arrangement of their own bedroom/dorm room. The room layout can be embellished with other hook-backed shapes (either homemade or borrowed from other APH kits). For example, a circular or square piece can symbolize the location of a rug within the room. Identify features of their own bedroom that differ from those shown in Layout 4. Perhaps, unlike the 2D layout, the student's personal bedroom doesn't have a desk or end tables.

Continue to practice a variety of spatial concepts while the student constructs the 3D layout of their bedroom. Encourage the student to use descriptive spatial terms (e.g., *across from, apart, in front of*) as they arrange and place the room features/models in relationship to each other within the 3D room. For example, does their bed face toward or away from a window?

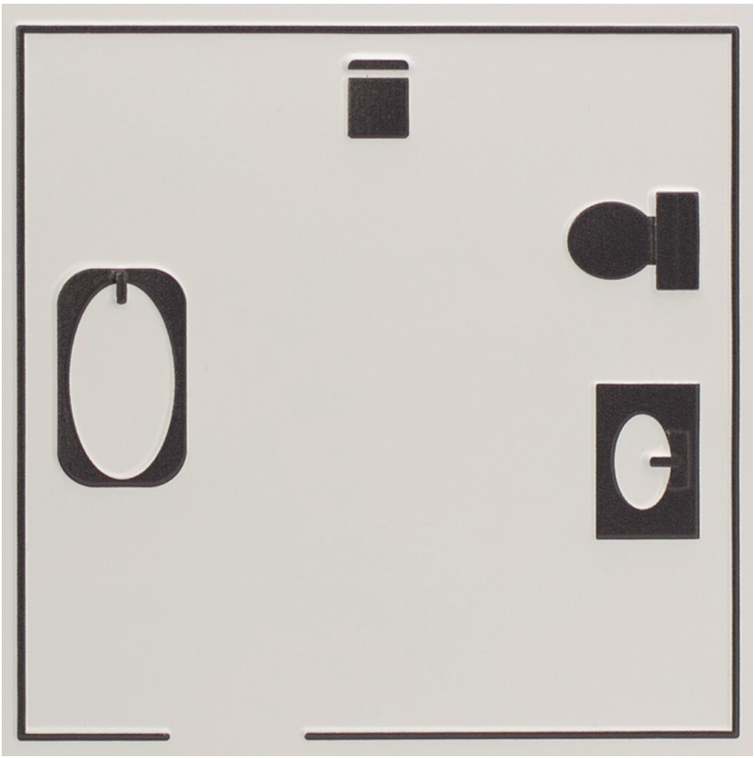


LAYOUT 5

Bathroom

RWAV Materials

- 2D Layout 5
- felt board
- (4) 5.5-in. foam (short) walls that match those in the 2D layout
- (1) straight-backed chair
- (1) bathroom sink (with one basin)
- (1) toilet
- (1) bathtub
- (1) human figure
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts



Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. *Be sure to use the short walls for this layout.* Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. The position of the door entrance should match that represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize that each shape within the 2D layout represents the top view of each piece of furniture or room feature. The underside of each 3D model will have

hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.

Focusing on Details

Have the student notice the orientation line associated with the small straight-backed chair within Layout 5. The back of the chair is represented by a raised line that sits higher than the raised area that represents the chair seat. The separated line assists in identifying the directionality of the chair within the room layout.

Have the student explore the 3D model of the single-basin sink in combination with its 2D representation in Layout 5. The raised short line in the 2D representation denotes the faucet. This tactile feature assists in determining the direction of the sink within the bathroom

setting. The oval basin is represented by a smooth incised area that sits at a lower elevation than the surrounding countertop.

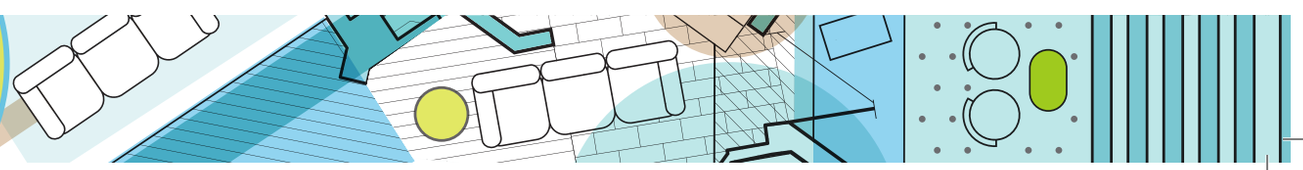
Have the student explore the 3D model of the bathtub in combination with its 2D representation in Layout 5. The 2D representation has a tactually discernible faucet that extends into the oval-shaped incised area of the bathtub; the line representing the faucet assists in determining the orientation of the bathtub within the bathroom setting. Compare the oval shape of the bathtub with that of the bathroom sink; both are similar in shape but differ in size. Emphasize the location of the faucet for each—at one end (tub) or in the center (sink).

Have the student explore the 3D model of the toilet in combination with its 2D representation in Layout 5. Notice that the toilet seat lid is a solid oval shape. The rectangular toilet tank sits higher than the seat in the 2D layout; this corresponds to the higher elevation of the toilet tank in comparison to the toilet seat on the 3D model. Compare the solid oval shape of the toilet seat lid to the oval recessed areas of the bathtub and bathroom sink.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Which is the *largest* feature in the bathroom? (bathtub)
- Which bathroom feature is *farthest from* the door? (chair)
- If the chair is on the *north side* of the bathroom, where is the bathtub located? (*west side*) The bathroom sink? (*east side*)
- Describe the bathtub's location in relation to both the sink and toilet. (*across from*)
- Is the back of the bathtub *closer* to the door or the chair? (door)



Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- "Walk" a 3D person *through* the doorway and *toward* the bathtub.
- Face the 3D person *toward* the bathroom sink.
- Place the toilet on the *other side* of the bathroom sink.
- Move the chair to a *corner* of the bathroom.
- Rotate the bathtub so that the faucet is *closer* to the door.
- Place the bathroom sink *to the right* of the door.
- Have the student embellish or change the bathroom layout based on the instructor's verbal directions. For example, replace the single-basin sink with a double-basin sink (as used in the kitchen); add a wall with a window; create a powder room by removing the bathtub, etc.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Rotate the 2D or 3D layout *clockwise* or *counterclockwise* 90 or 180 degrees, then have the student describe the position of room features from a different perspective.

Build an adjoining room to the bathroom—a bedroom, living room, or kitchen. Have the student "walk" a 3D person between both rooms and describe the location of room features from the 3D person's perspective as they travel from one room to another (e.g., the sink is to my *right*; the bed is *against* the *far* wall, etc.).

Creative Approaches

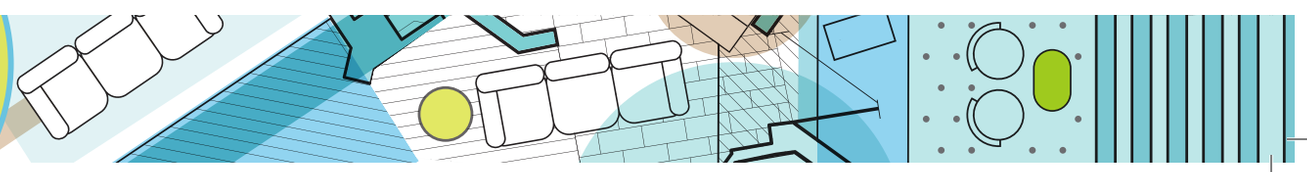
Allow the student an opportunity to re-create the same top-view perspective shown in Layout 5 using other tactile drawing media such as APH's Quick-Draw Paper, DRAFTSMAN, or Picture Maker. The room drawing can also be made using commercially available collage materials, waxed yarn, magnetic pieces/shapes on a metal board, etc. Compare and contrast the student's drawing with the 2D layout. What changes did the student need to make to the tactile design? Compare and discuss the differences between the 2D layout and the student's design.

Use multiple small chair models from RWAV to improvise separate stalls encountered in school bathrooms. Create stall divisions with small strips included with Picture Maker or cut short strips from the low-profile hook material included with Room with a View.

Real Room Experiences

Emphasize the dramatic shift in size from the real bathroom features (bathtub, sink, toilet) to that of the 3D models/counterparts. Also, discuss which parts are movable on real bathroom features (faucets, toilet lids).

Ask the student to use 3D models from the RWAV kit to closely represent the arrangement of their own bathroom at home (or other familiar location). The layout can be embellished with other hook-backed shapes (either homemade or borrowed from other APH kits). For example, a square piece can symbolize the location of a bathmat. Identify features of their own bathroom that differ from those shown in Layout 5. Perhaps, the student's personal bathroom has a shower instead of a bathtub.

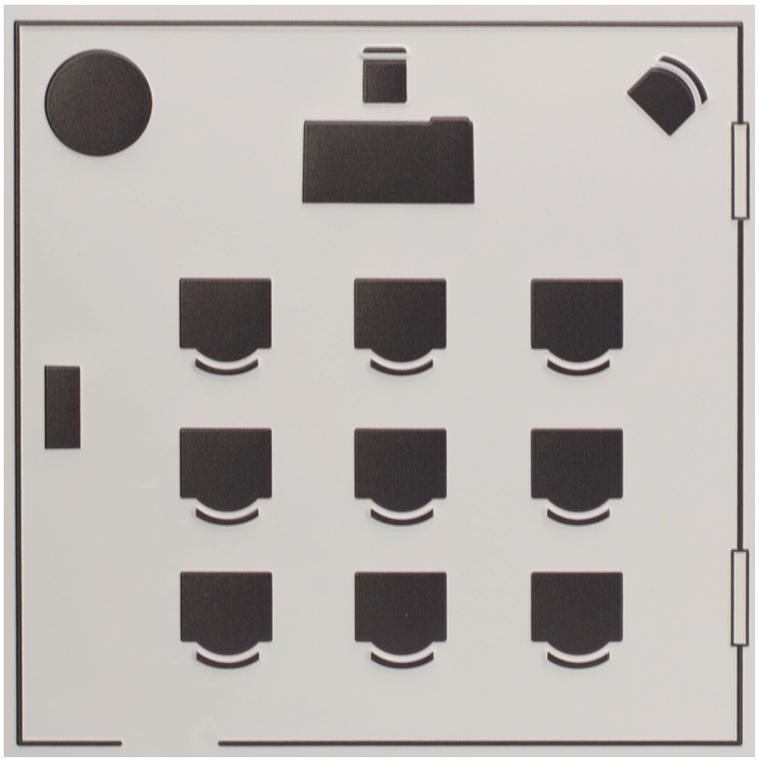


LAYOUT 6

Classroom 1

RWAV Materials

- 2D Layout 6
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (1) straight-backed chair
- (1) office desk
- (1) round table
- (1) small bookshelf
- (9) school desks
- (10) curved-backed chairs
- (2) human figures
- (1) computer monitor
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

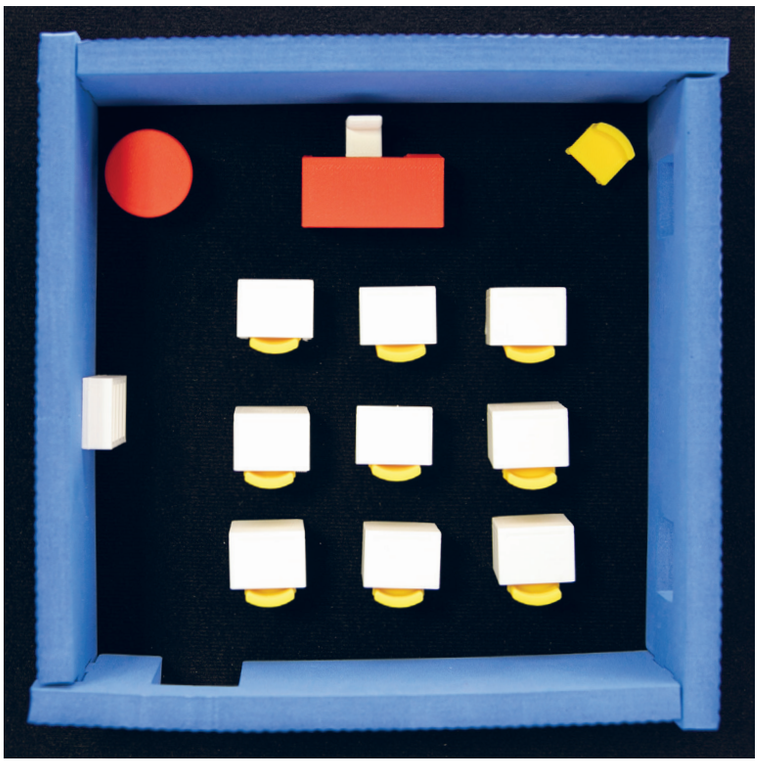


Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows of the foam walls should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize that each

shape within the 2D layout represents the top view of each piece of furniture or room feature. The underside of each model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

Have the student notice the difference between the straight orientation line associated with the small straight-backed chair and the curved orientation line associated with the larger curved-back chair. The back of each chair style is represented by a raised line that sits higher than the raised area that represents the chair seat. The separated line assists in identifying the directionality of each chair within the room layout. In Layout 6, two versions of the curved-back chair are encountered. One curved-back chair sits alone

in the corner of the room and the full chair seat is shown. However, most of the curved-back chairs are pushed under the rectangular school desks; just a small portion, or slice, of the curved chair seat is shown behind each desk.

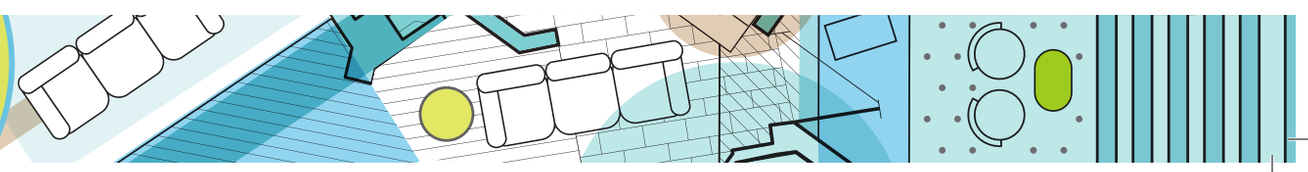
Reacquaint the student with the office desk previously incorporated in Layout 4: Bedroom. In this classroom setting, the office desk now represents the teacher's desk that faces the students' school desks. The top view of the desk is conveyed by the raised rectangular shape within Layout 6. The middle desk drawer protrudes slightly outward from the top and bottom drawers on the 3D model. This slight drawer extension is captured in the 2D layout to help indicate directionality.

The round table and small bookshelf were encountered in earlier RWAV 2D layouts (Layouts 3 and 4, respectively), however, take time to revisit the unique shapes of each 3D model with the student. Compare the round surface of the small table to the rectangular surface of the small bookshelf and larger desk. Emphasize the one-to-one shape and size correspondence between each 3D model and its 2D representation.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the three school desks in the *front row* that are *closest to* the teacher's desk or *nearest to* the *front* of the classroom.
- Locate the three school desks in the *back row* that are f*arthest from* the teacher's desk or *nearest to* the *back* of the classroom.
- If the teacher's desk is on the *north side* of the classroom, where is the bookshelf located? (*west side*) The two windows? (*east side*)



- If the teacher's desk is on the *north side* of the classroom, in which *corner* of the classroom is the *round* table? (*northwest corner*)
- Locate the school desks that are *between* other school desks.
- Locate the school desk that is in the *center* of the school desk arrangement.
- Locate the school desk that is *closest to* the classroom door.
- Locate the *straight-backed* chair *behind* the teacher's desk.
- Which is *farthest from* the classroom door—the bookshelf or *round* table? (*round* table)

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- Have the student create different school desk arrangements. For example, position all school desks within each row *next to* each other without leaving a space *between* them; the sides of adjacent desks should touch.
- Have the student move furniture to specific locations within the classroom based on the instructor's verbal directions. For example, *center* the bookshelf *between* two windows; move the chair in the *corner* of the room *next to* the *round* table; push the teacher's chair *closer to* the teacher's desk, etc.
- Link the RWAV walls so that the door entrance is *in front of* the classroom and *close to* the teacher's desk.
- Place a computer monitor *on top of* the teacher's desk.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

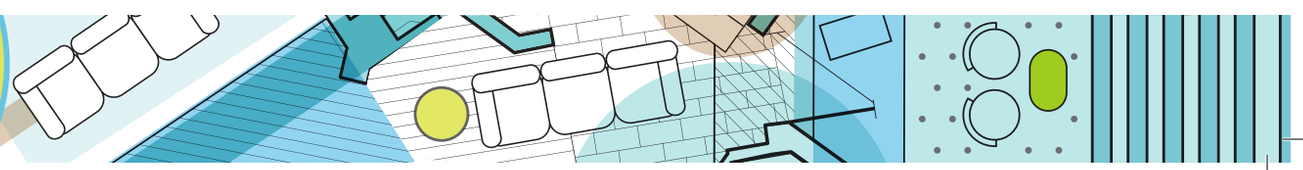
Using the 3D layout of the classroom, remove the teacher's desk and replace it with a 3D person. Have the student position the person *behind* the desk so that it faces *toward* the students' desks. Use another 3D person (to represent a student) and face the figure *toward* the teacher. Emphasize that from the student's perspective, the teacher is standing *behind* the large desk. From the teacher's perspective, the students are sitting *behind* their desks.

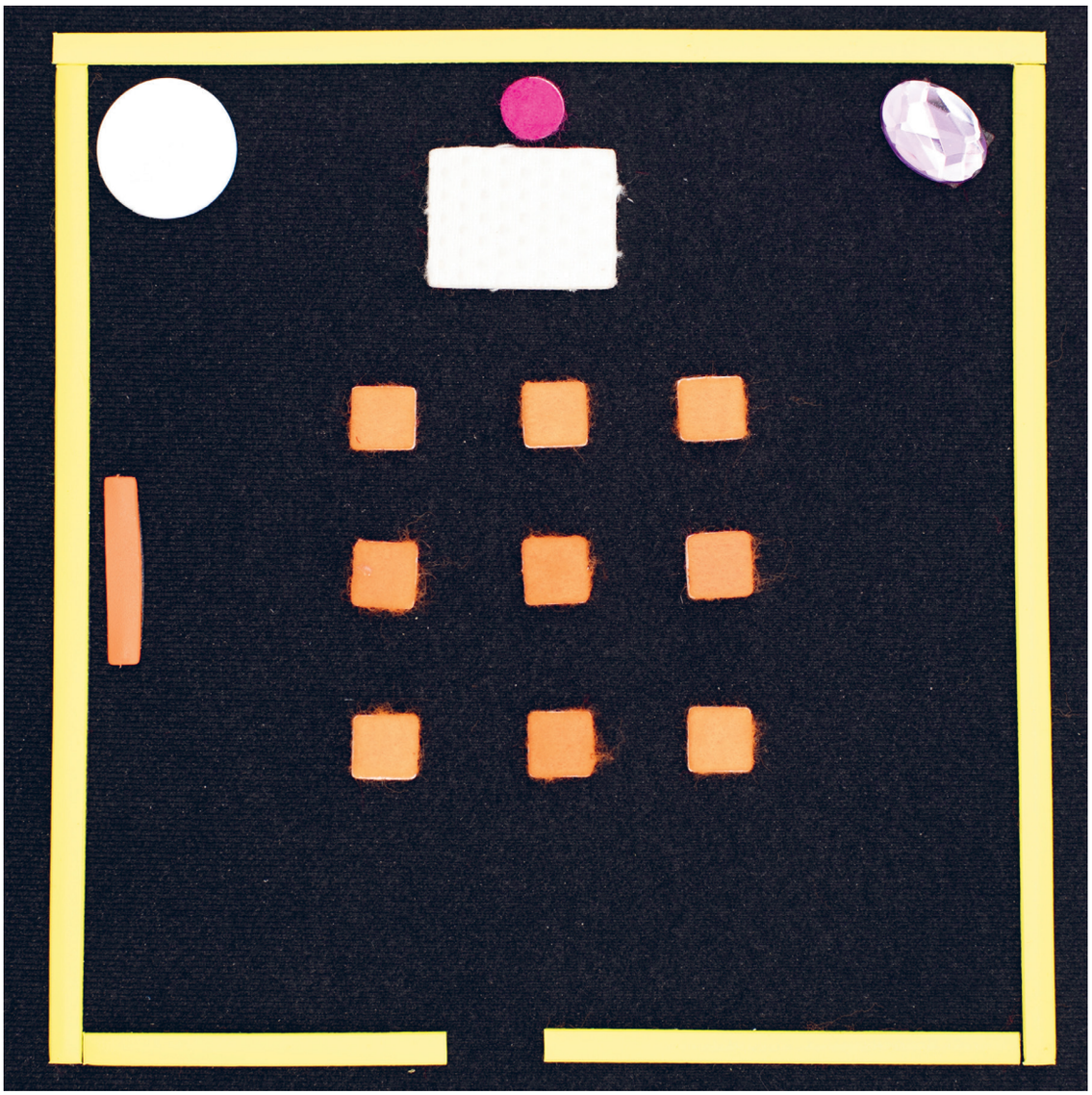
"Walk" a 3D person *through* the doorway *toward* a school desk at the *end* of a *row*, in the *middle row*, in the *back row*, in the *front row*. As the 3D person walks from desk to desk within the classroom, have the student describe the location of the surrounding desks and classroom furniture using positional terms—*beside*, *behind*, *in front of*, to the *right/left*, *between*, *next to*, *away from*, etc.

Use the Perspective layout to demonstrate the top-view and side-view perspectives of the office (or teacher's) desk. The tactile relief of the desk is higher and more detailed than that in the 2D layout of the classroom. Have the student orient the 3D model of the desk to match each view shown in the Perspective layout.

Creative Approaches

Allow the student an opportunity to re-create the same top-view perspective shown in Layout 6 using other tactile drawing media such as APH's Quick-Draw Paper, DRAFTSMAN, or Picture Maker. The room drawing can also be made using commercially available collage materials, waxed yarn, magnetic pieces/shapes on a metal board, etc. Compare and contrast the student's drawing with the 2D layout. What changes did the student need to make to the tactile design? Compare and discuss the differences between the 2D layout and the student's design.





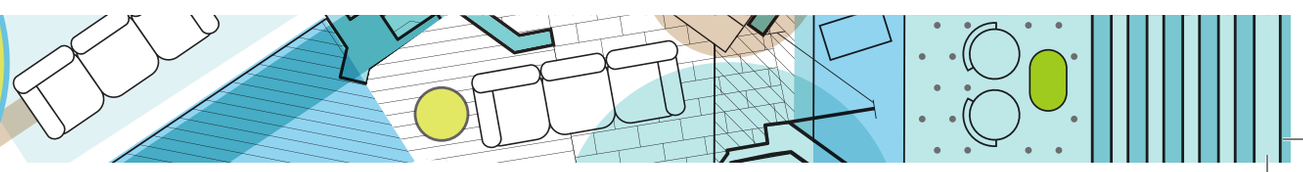
Real Room Experiences

Examine the differences between the 3D school desk models and those within the student's actual classroom with regards to number, position, and shape.

Ask the student to use 3D models from the RWAV kit to closely represent the arrangement of their own school classroom (if applicable) or a classroom setup they remember from earlier grades. The layout can be embellished with other hook-backed shapes (either homemade or borrowed from other APH kits). Identify features of their own classroom that differ from those shown in

Layout 6. For example, in lieu of separate school desks, perhaps large tables are shared by multiple students. Continue to practice a variety of spatial concepts while the student constructs the 3D layout of the classroom. Encourage the student to use descriptive spatial terms (e.g., *apart*, *toward*, *in front of*) as they arrange and position 3D models in relationship to each other within the map.

Have the student demonstrate a variety of spatial concepts by standing *beside* a school desk, *behind* a desk, *near* the teacher's desk, *between* two rows of desks, etc. Have the student mimic their own position within the real classroom setting using the 3D models within a constructed RWAV classroom.

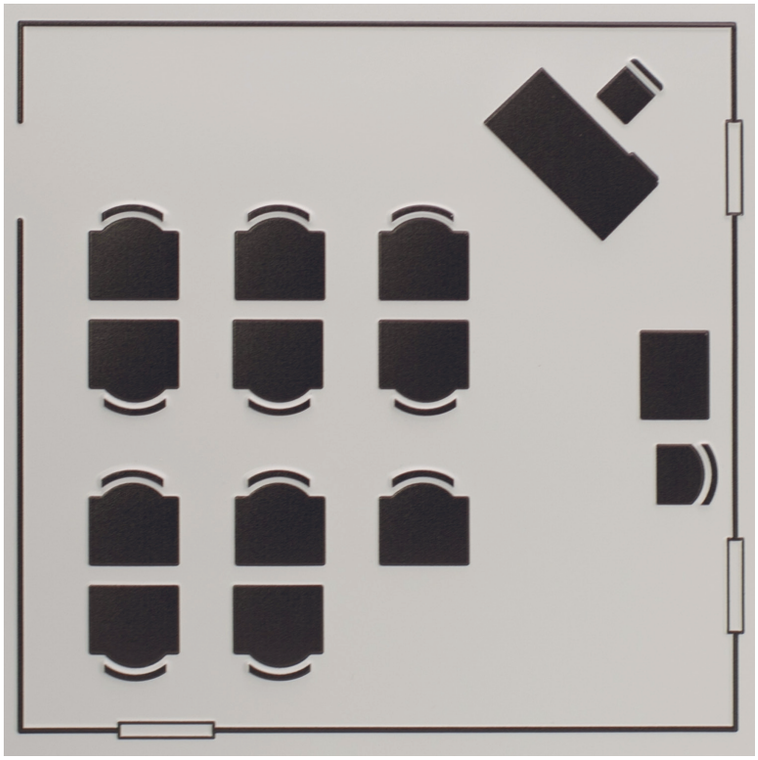


LAYOUT 7

Classroom 2

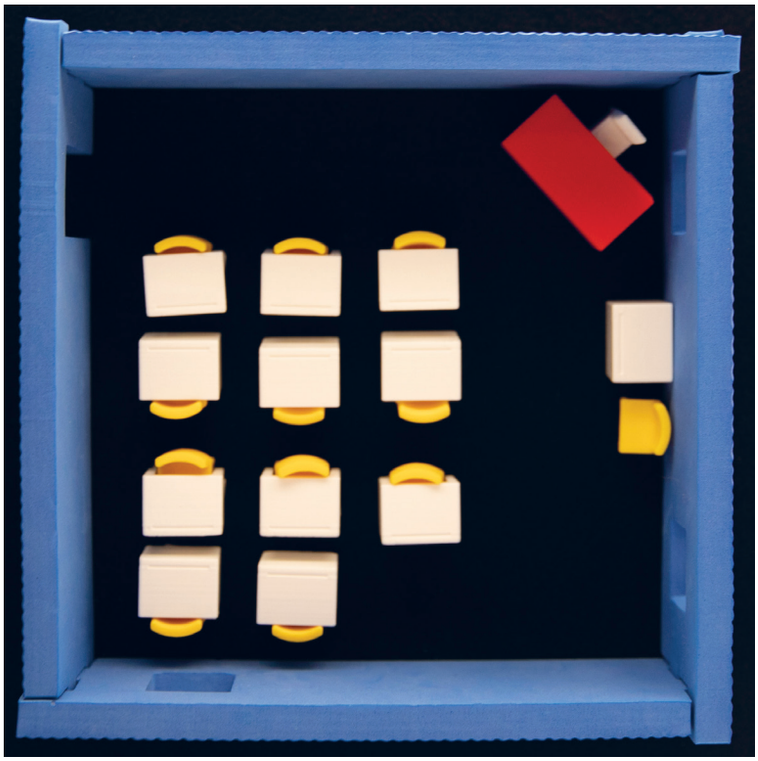
RWAV Materials

- 2D Layout 7
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (1) straight-backed chair
- (1) office desk
- (12) school desks
- (12) curved-backed chairs
- (2) human figures
- (1) computer monitor
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts



Initial Orientation/Setup

Refer to directions provided in Layout 6: Classroom 1.



Focusing on Details

Revisit room features that were encountered in previous layouts with the student, such as orientation lines representing the back of the chairs, the orientation of the teacher's desk in relation to the arrangement of the school desks, and the different presentations of the curved-back chair with chair seat either fully hidden or fully shown.

Have the student compare Layout 6 and Layout 7. Discuss how the classroom arrangements are different from each other. Examples of possible differences may include the following:

- the number of desks
- the arrangement of the school desks
- the position of the teacher's desk
- the location of the classroom door/entrance
- the number of windows
- the presence/absence of a circular table and bookshelf
- the distance between desks

Spatial Concepts and Skills

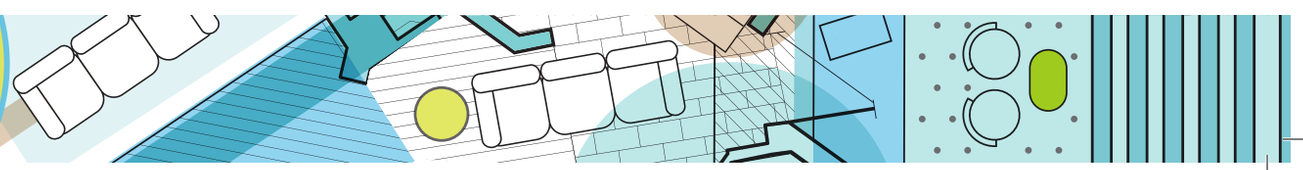
Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- If the teacher's desk is in the *northeast corner* of the classroom, locate the school desk that is *closest to* the *southwest corner*.
- Locate the curved-backed chair that is sitting *beside* a school desk.
- If the teacher's desk is in the *northeast corner*, which school desks are facing *north*? *South*?

- Locate pairs of school desks that are *facing toward* each other. How many are there? (five pairs)
- Locate the school desk that is *closest to* the classroom door.
- Locate the *straight-backed* chair *behind* the teacher's desk.
- Locate the desks *nearest to* the *south side* of the classroom.
- If the teacher's desk is in the *northeast corner*, on which wall is the door located? (*west* wall)
- Which side of the room has the most windows? (*east side*)
- Locate the window *closest to* the teacher's desk.
- Locate the window that is *diagonal from* the classroom door.

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- Remove the teacher's desk chair and replace it with a 3D person. Have the student position the 3D person so that it is *facing toward* the classroom desks.
- Have the student *rotate* the school desks so that they all *face toward* the *front* of the classroom (the wall with no windows).
- Have the student move or add furniture within the classroom based on the instructor's verbal directions. For example, place two bookshelves *next to* each other *against* the wall without windows; center the teacher's desk at the *front of* the classroom; place a curved-back chair in the *southeast corner* of the classroom; place a computer monitor *on top of* the teacher's desk; position a student (3D person) *next to* a school desk *nearest to* the *back* of the classroom, etc.



Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Rotate the 2D or 3D layout *clockwise* or *counterclockwise* 90 or 180 degrees, then have the student describe the position of room features from a different perspective. For example, rotate the classroom layout or setup so that the side with one window is *farthest away* from the student. Have the student use a variety of spatial terms to describe the classroom from this new perspective. For example, the teacher's desk is in the *southeast corner* of the classroom, the wall with the door is on the *right side* of the room, etc.

"Walk" a 3D person within the classroom. As the 3D person walks around the classroom, have the student describe the location of the surrounding desks and classroom furniture using positional terms—*beside*, *behind*, *in front of*, to the *right/left*, *between*, *next to*, *away from*, etc.

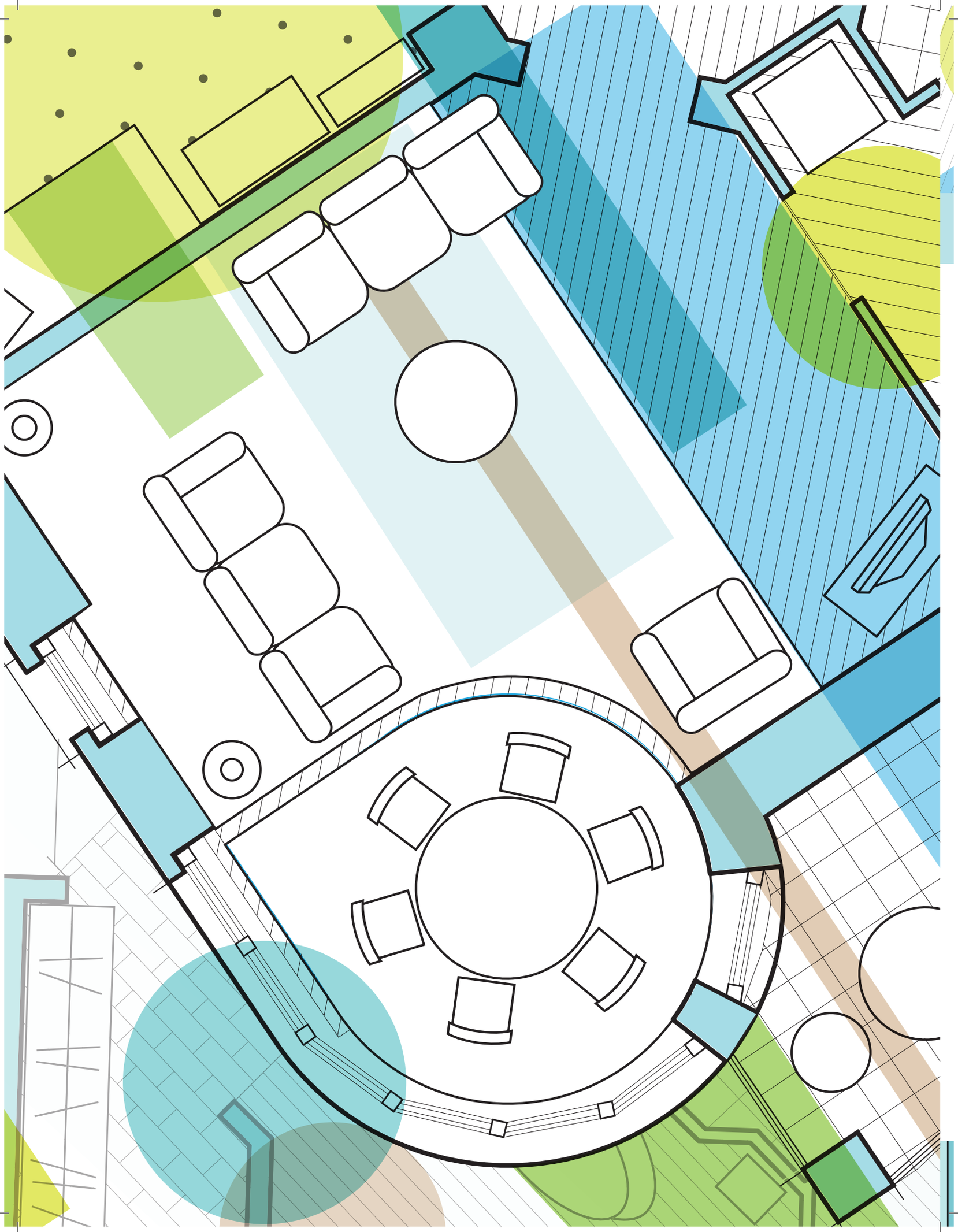
Add other 3D persons to represent other students within the classroom setting. Describe their location in relation to each other (e.g., *next to, across from, facing each other*).

Creative Approaches

Refer to the suggestions provided in Layout 6: Classroom 1.

Real Room Experiences

Refer to the suggestions provided in Layout 6: Classroom 1.

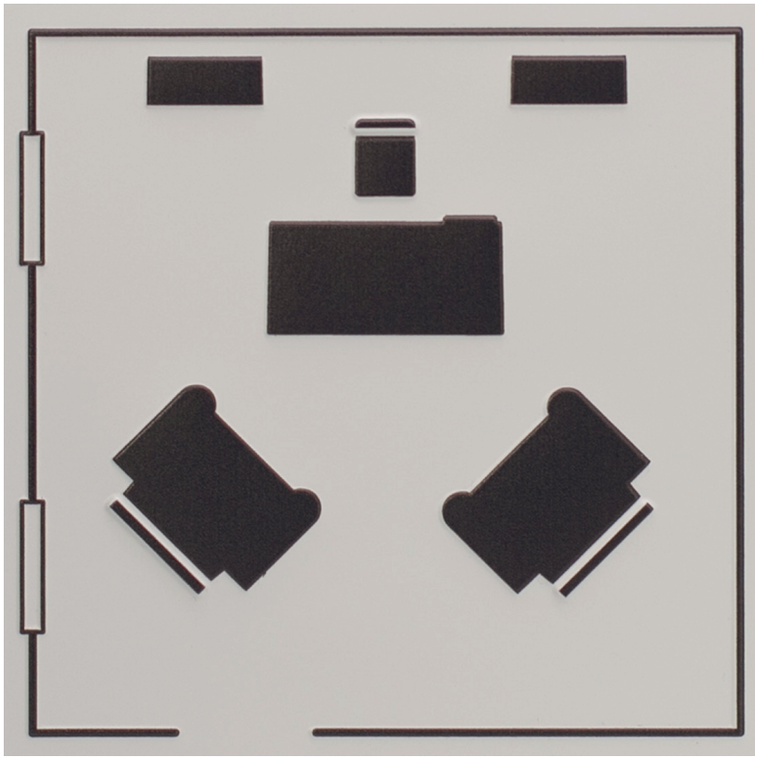


LAYOUT 8

Office

RWAV Materials

- 2D Layout 8
- felt board
- (4) 5.5-in. foam (short) walls that match those in the 2D layout
- (1) straight-backed chair
- (1) office desk
- (1) small bookshelf
- (1) dresser (to represent office file cabinet)
- (2) armchairs
- (1) computer monitor
- (2) human figures
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

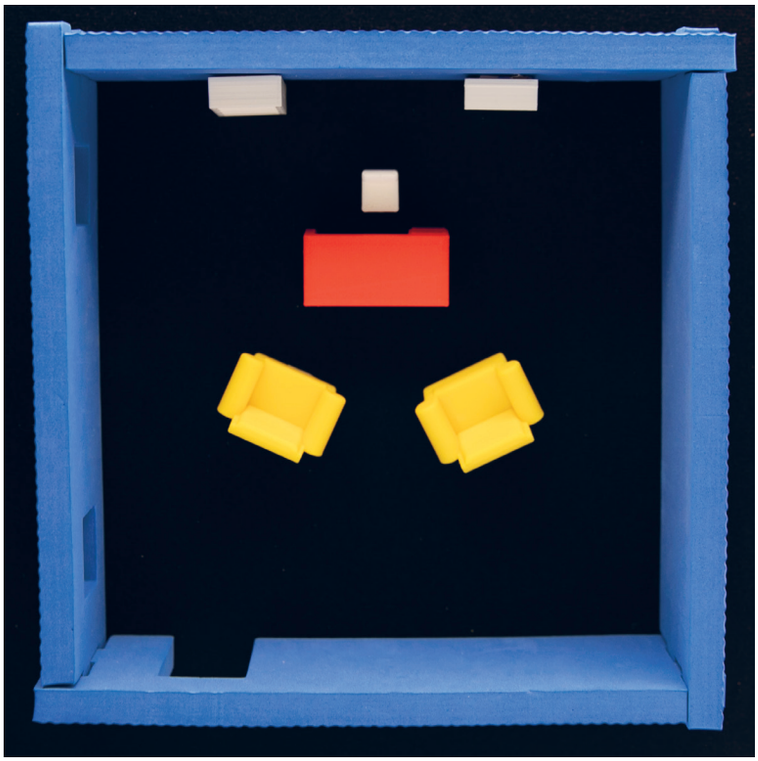


Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. *Be sure to use the short walls for this layout.* Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize

that each shape within the 2D layout represents the top view of each piece of furniture or room feature. The underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

This office setting uses 3D models encountered in previous RWAV 2D layouts. Re-emphasize the following details:

- The back of the chair is represented by a raised tactile line that is higher than the raised area that represents the chair seat. The separated line assists in identifying the directionality of each chair within the room layout.

- The silhouette shape of the bookcase and dresser from a top-view perspective within the 2D layout are identical. There is not a right or wrong placement of these pieces within the room setting.
- The middle desk drawer protrudes slightly outward from the top and bottom drawers on the 3D model. This slight drawer extension is captured in the 2D layout to help indicate directionality. Compare the top view of the desk to the rectangular shape of a sofa chair. What features distinguish the two furniture pieces apart?

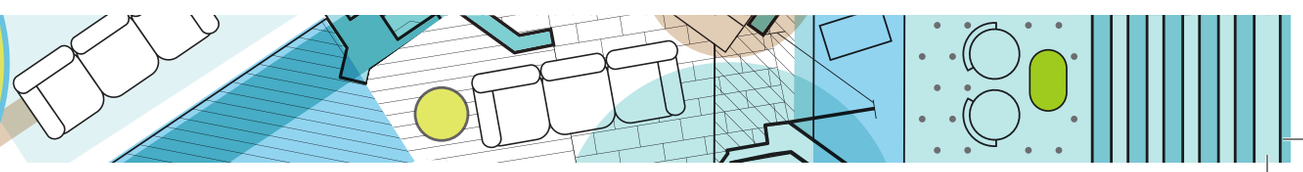
Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student the following:

- If the bookshelf and file cabinet are on the *north side* of the office, on which *side* of the room are the windows? (*west*) Which direction is the office chair facing? (*south*)
- Describe the location of the bookshelf and file cabinet in relation to the office desk. (*behind the* office desk)
- Locate the armchair that is *closest to* the entrance to the office.
- Locate the armchair that is *directly opposite* the file cabinet.
- Locate the armchair that is *directly opposite* the bookshelf.
- Which piece of furniture is best described as positioned in the *center* of the room? (office *desk*).

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- Position a 3D person *next to* the small office chair so that the



person faces *toward* the desk. Position another 3D person on the *other side* of the desk so that the person faces *toward* the other 3D person.

- "Walk" the 3D person that is *behind* the desk to the *other side* of the desk to stand *next to/beside* the other 3D person.
- Position either the bookshelf or file drawer *between* the two windows.
- Position one of the armchairs *against* the *east* wall.
- Place the computer monitor *on top of* the office desk and face the screen *toward* the office chair.
- Place the file cabinet and bookshelf *against* each other on the *same* wall.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Pivot the felt board with the 3D office setup in 90-degree increments, turning it in a *clockwise* direction. At each new position, have the student describe the view from their perspective. For example, is the office desk *nearer to* them than the office chair? Are the windows to the *left* or *right* of them? Which armchair is *nearer/closer* to them?

Creative Approaches

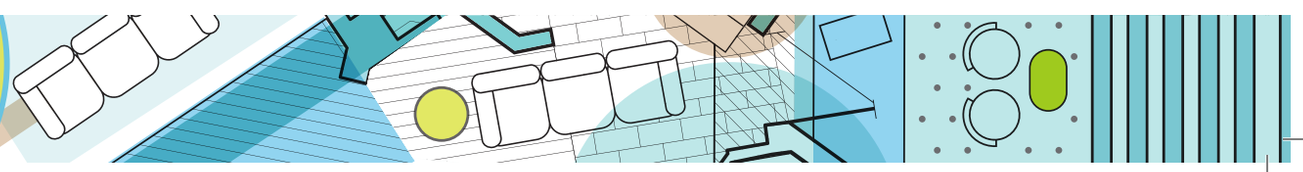
Allow the student an opportunity to re-create the same top-view perspective shown in Layout 9 using other tactile drawing media such as APH's Quick-Draw Paper, DRAFTSMAN, or Picture Maker. The office layout can also be created using commercially available collage materials, waxed yarn, magnetic pieces on a metal board, etc.

Real Room Experiences

Visit an actual office setting. Have the student duplicate the room's arrangement using available RWAV 3D parts in combination with other hook-backed pieces, if desired.

Review a variety of spatial concepts within an actual office setting. For example, walk *around*, stand *behind*, or *stand in front of* the office desk; sit *in* the desk chair and *face toward* the computer; greet someone as they *enter* the room; etc.

Discuss an office setting that the student might remember visiting in the past and recreate it from memory using RWAV models and other tactile embellishments. Which room features were most prominent and noticeable? Were there sounds that indicated the presence and location of surrounding office equipment such as copiers, braille embossers, or paper shredders? Was it an office setting for one person, or was the office shared by multiple workers?

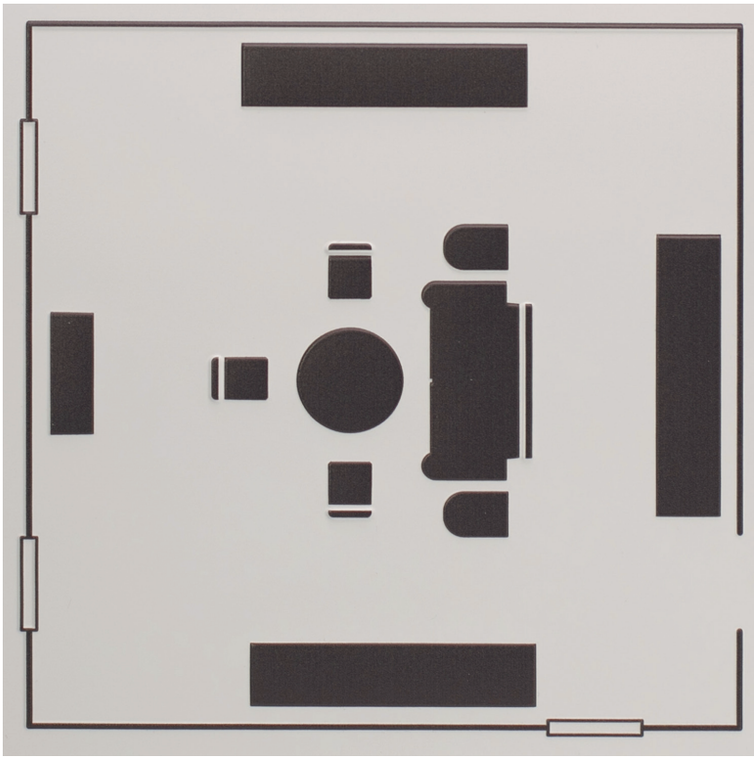


LAYOUT 9

Meeting Room/Lounge

RWAV Materials

- 2D Layout 9
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (3) straight-backed chairs
- (1) couch/sofa
- (1) round table
- (3) large bookshelves
- (2) end tables
- (1) fireplace
- (3) human figures
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

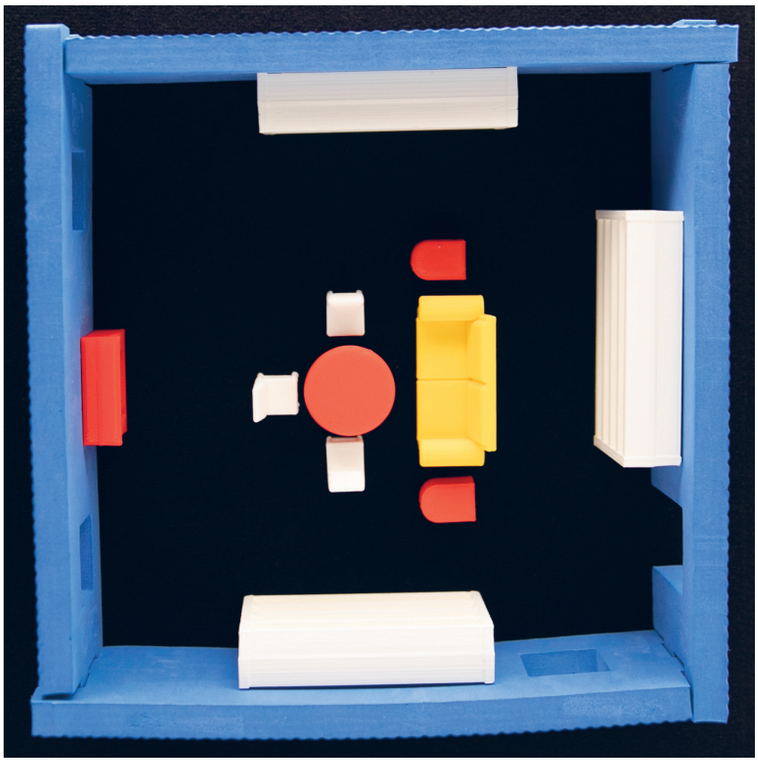


Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize that each shape within the 2D layout represents the top view of each piece of

furniture or room feature. The underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

With the exception of the large bookshelves, the lounge/meeting room uses some of the 3D models encountered in previous RWAV 2D layouts. Emphasize the following details of the 3D models.

- The higher back of each straight-backed chair and sofa is represented by a raised line that sits higher than the raised area that represents the seat cushion of the sofa or chair. The separated line assists in identifying the directionality of the sofa or chair within the room layout. The arms of the sofa

and armchairs are slightly rounded to provide an additional directional cue.

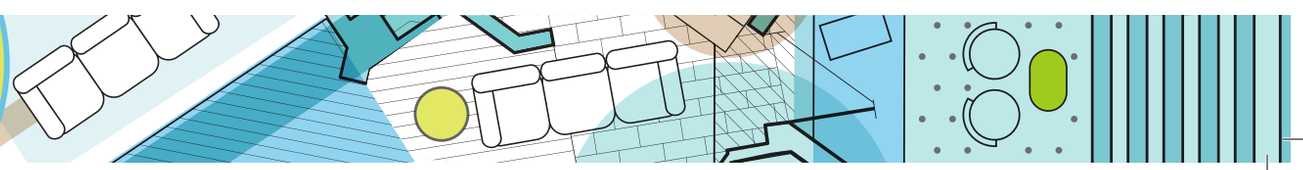
- The top view of each large bookshelf is represented by a rectangular shape that is noticeably larger than the rectangular shape that represents the fireplace. Be sure to have the student compare the bookshelf and fireplace next to each other and notice the size difference.
- One side of each end table is curved. Explore the three straight sides and the curved end of each end table. The curved end will help identify the table's orientation within the 2D layout.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the circular table in the *center/middle* of the room.
- Identify straight-backed chairs that are *facing* each other (or *opposite* each other).
- Locate the straight-backed chair that is *opposite* the sofa/couch.
- What room feature is located *between* two windows? (fireplace)
- Locate the large bookshelf that is *behind* the sofa/couch.
- If the fireplace is in the *west side* of the room, which sides of the room feature a large bookshelf? (*north*, *east*, and *south*)
- Locate the chair that is *farthest from* the two end tables.
- Locate two large bookshelves that are *across from* each other.

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:



- Randomly place three 3D persons within the room layout. Ask the student to find the person *closest to* the sofa, *farthest from* a window, *beside* a bookshelf, *nearest to* the doorway, etc.
- Have the student position the end tables *against* the sofa's arms; move the chairs *closer to* the *round* table; place two large bookshelves *adjacent* to each other *against* the wall without windows, etc.
- Have the student move a 3D person within the room and describe their direction of travel in relation to other items in the room (e.g., *exiting* the room, walking *between* the sofa and table, walking *toward* the fireplace).
- Have the student create an entirely new meeting room/lounge arrangement using the same furniture pieces, then describe the location of the pieces in relation to each other using relevant spatial terms.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Replace the round table in the 3D layout of the meeting room/lounge with a 3D human figure. Pivot the 3D person to face *north*, *south*, *east*, and *west*. With each rotation, have the student describe from the 3D person's perspective the furniture piece(s) *behind* them, to their *left*, to their *right*, and *in front of* them.

Creative Approaches

Perform a tactile memory game. For example, after the student becomes familiar with the 3D setup of Layout 9, make a positional change to a single piece of furniture. Perhaps rotate it, position it

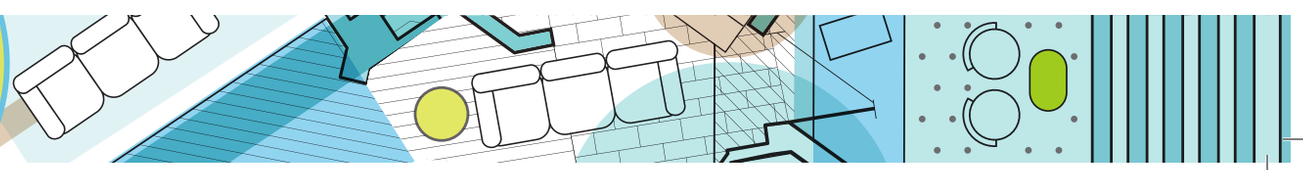
against a wall, or move it closer to a window, etc. Can the student identify the furniture or room feature that changed from the original setup? Instead of moving a piece of furniture, remove it from the room setup. Can the student identify the missing piece?

Add the ceiling to the top of the room. Have the student remove it and notice that the furniture is shown from a top-view perspective. Discuss other common terms for "top view" such as "birds-eye view" and "aerial view." Emphasize this perspective using real objects. For example, sit a drinking cup on a table. Using a sheet of tactile drawing film on a DRAFTMAN or a sheet of Quick-Draw Paper, have the student explore the cup and draw what the cup feels like from a top-view perspective. The top view of the cup would likely be drawn as a raised outline circle that represents the rim of the cup.

Real Room Experiences

Visit an actual meeting room/lounge (e.g., a teachers' lounge). Have the student duplicate the room's arrangement using available RWAV 3D parts in combination with other hook-backed pieces.

Have the student identify important features of the real meeting room/lounge that serve as important landmarks for navigation purposes.

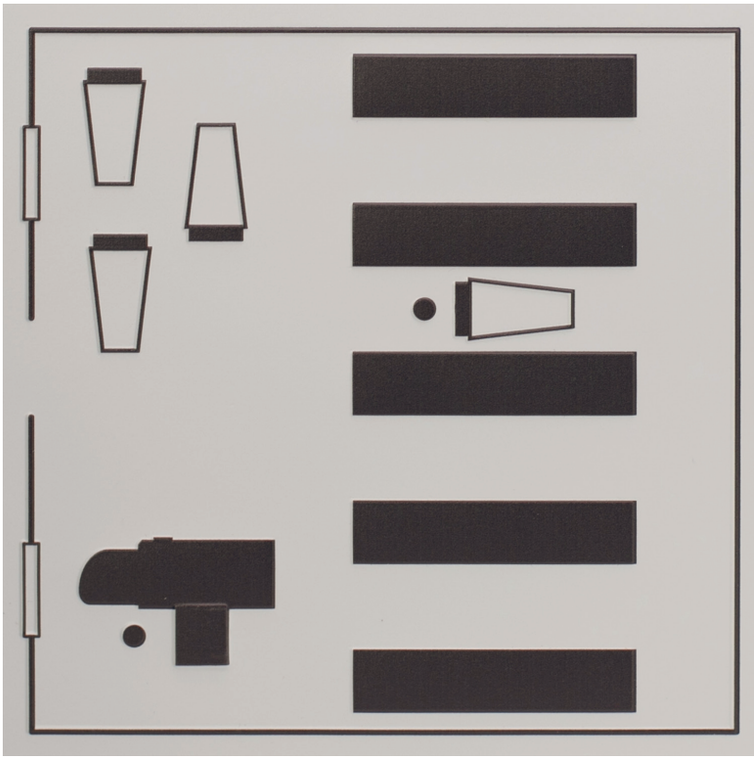


LAYOUT 10

Small Grocery Store

RWAV Materials

- 2D Layout 10
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (5) large bookshelves/grocery shelves
- (4) shopping carts
- (1) checkout counter
- (2) human figures
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts



Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and windows should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize that each shape within the 2D layout represents the top view of each piece of

furniture or room feature. The underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.

Focusing on Details

Layout 10 incorporates shopping carts and a checkout counter that were not encountered in previous RWAV layouts.

Allow time for the student to tactually explore the 3D model of the shopping cart and notice the cart's unique shape that helps distinguish it from other RWAV 3D models. For example, the outer sides of the shopping cart have a rough, basket-weave texture that has an overall rough feel. Unlike the 3D models that represent the grocery shelves, the shopping cart has a unique top and bottom. The top of the shopping cart has a deep recessed area surrounded

by a discernible raised edge, as well as a slightly extended handle on one end. The bottom of the shopping cart has four wheels that feel slightly recessed from the side view. For visual identification, all the shopping carts are yellow.

Notice that the human figure is represented by a single bold dot that corresponds to the top of the shopper's or cashier's head.

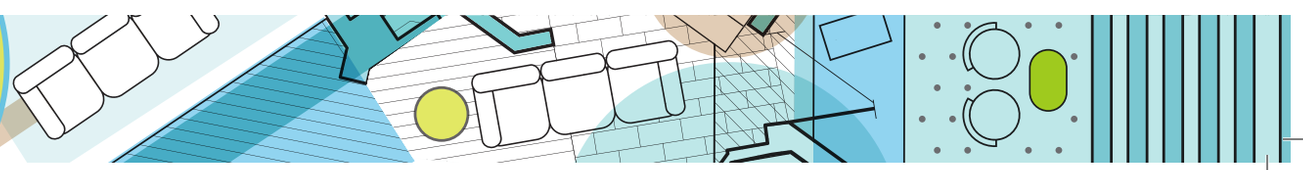
Have the student notice that the handle of the shopping cart is represented in the 2D layout by a short extension. The basket portion of the shopping cart feels like a raised-line trapezoid shape. The shortest side represents the front of the shopping cart that is opposite the side with the handle. The handle will assist the student in identifying the direction a shopping cart is facing within the grocery store.

Allow time for the student to tactually explore the 3D model of the checkout counter and notice the salient characteristics/features including the cash register, the narrow and elevated customer touchscreen, the conveyor belt area, and the curved end of the counter. For visual identification, all the checkout counters are red.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the *entrance* to the grocery store.
- Count the number of aisles created by the grocery shelves.
- Are all the shopping carts *near* the *front of* the store *facing* the *same direction*?
- Locate the person/grocery worker standing *behind* the checkout counter.



- If the entrance to the grocery store is on the *west side* of the building, which direction is the person *behind* the shopping cart *facing*? (*east*)
- If the entrance to the grocery store is on the *west side* of the building, in which *corner* of the store is the checkout counter? (*southwest corner*)
- Locate grocery shelves that are *closest to/against* the *interior* walls.
- Beginning from the *south side* of the room, identify the *first*, *second*, *third*, and *fourth* grocery aisles.

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- Add another checkout counter *next to* the existing one.
- *Face* all the shopping carts *near* the store *entrance* the *same direction*.
- Place a shopping cart in an aisle by itself that faces *toward* the *front of* the store. Place a 3D person *behind* the cart to face *away from* the *back of* the store.
- "Walk" a 3D person (and cart) *down* the rest of the aisle, *turn right* after reaching the *end* of the aisle. Locate the *adjacent* aisle and *turn right* again.
- Remove one of the five grocery shelves and provide more space between the four remaining grocery shelves. Have the student *face* two shoppers (and their respective carts) in *opposite* directions within the *same* aisle.
- Have the student create an entirely new grocery shelf

arrangement and then describe the location of the 3D models in relation to each other using a variety of spatial terminology.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

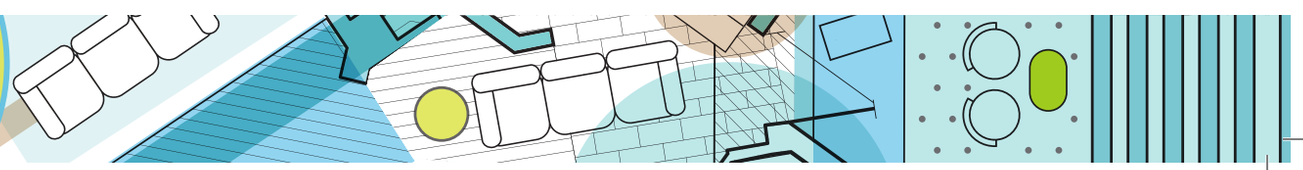
The 3D layout of the grocery store assists in the understanding of the concept of depth. Have the student notice that, within the 3D layout, it is noticeable that the grocery shelves are much *taller* than the shopping cart and 3D person/shopper. The shopper is also *taller* than the shopping cart, and the grocery worker is *taller* than the checkout counter. However, height differences are not conveyed in the 2D layout where the height of the shopping cart, grocery shopper, and checkout person all appear on the same level. The depth or recessed part of the shopping cart is also forfeited. Although the opening of the cart's basket is very apparent on the 3D model, the basket is simplified to a raised-line shape within the 2D layout. In addition, the various features of the checkout counter (e.g., conveyor belt, cash register) are flattened and appear at a lower profile.

Creative Approaches

Apply temporary stick-on tactile arrows or graphic art tape to the 2D layout to represent the shopper's walking route within the grocery store. For example, the arrow stickers demonstrate the weaving back and forth by the shopper between grocery aisles.

Real Room Experiences

Visit a real market/grocery store. Compare the 3D models with the actual shopping cart, checkout counter, and grocery shelves. Discuss features of the real objects that the 3D models did not capture

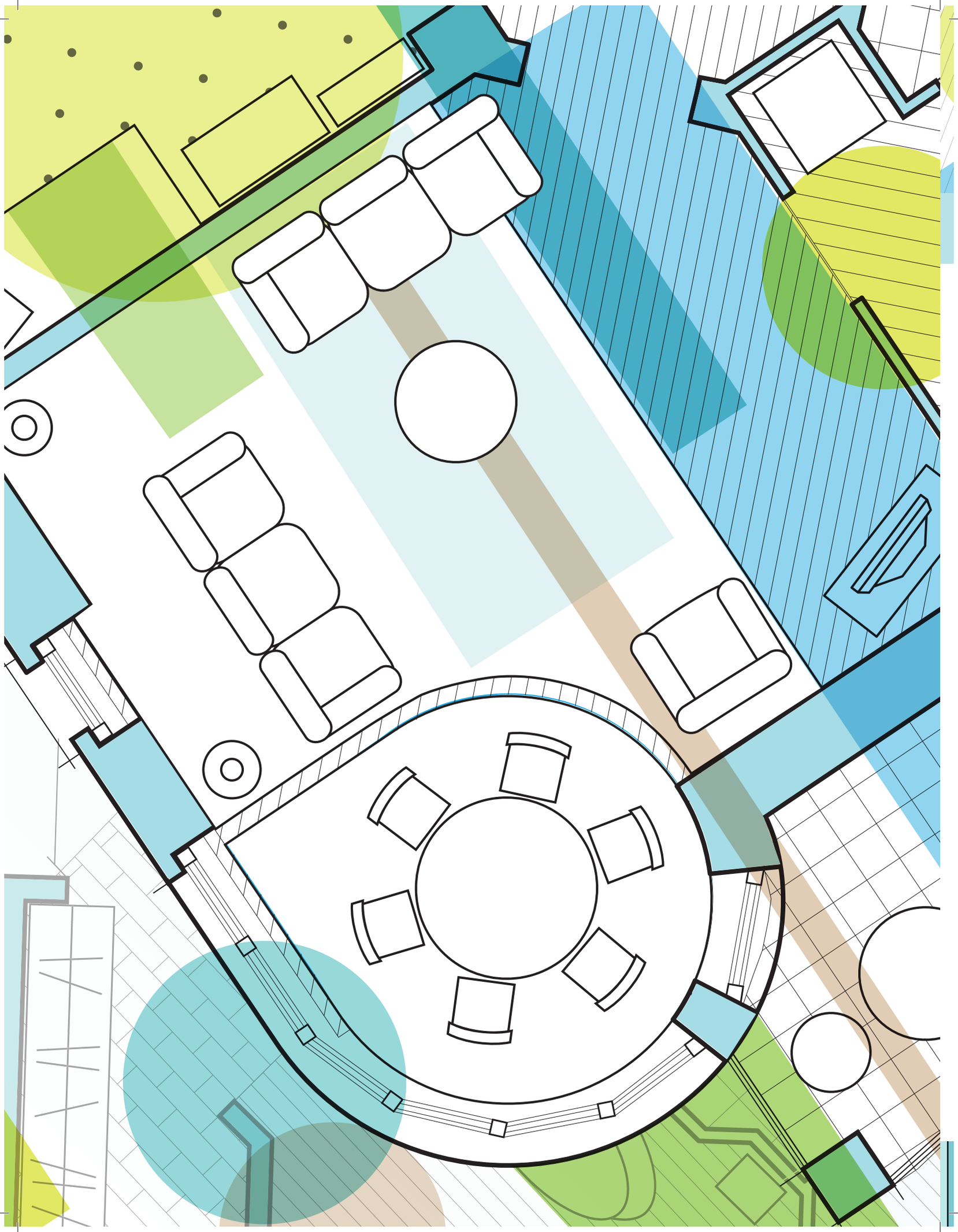


(e.g., the depth of the shopping cart basket, the movement of the conveyor belt of the checkout counter, the nesting of shopping carts, the moving wheels on the carts, the depth and height of grocery shelves).

Have the student design a map of the grocery store that they visited using the RWAV felt board and 3D models. If there are not enough RWAV pieces, or more space is needed to build the entire layout, embellish it with hook-backed shapes borrowed from other kits (e.g., APH's Picture Maker). For example, narrow hook-backed strips can represent a grocery shelf.

Have the student demonstrate and describe a variety of spatial terms during their experience within a real grocery store. For example, walk *between* grocery shelves; identify shelves to one's *left* and *right*; locate the *lowest/highest* grocery shelf; walk *behind* the shopping cart; place items *into* the shopping cart; push the cart *toward* the checkout counter, etc.

As the student navigates the actual grocery store, have them use a 3D model to represent their location within the store using the constructed tactile map. For example, turn the shopping cart in the same direction as they move around the grocery aisles, as they approach the checkout counter, as they pass other shoppers, etc.

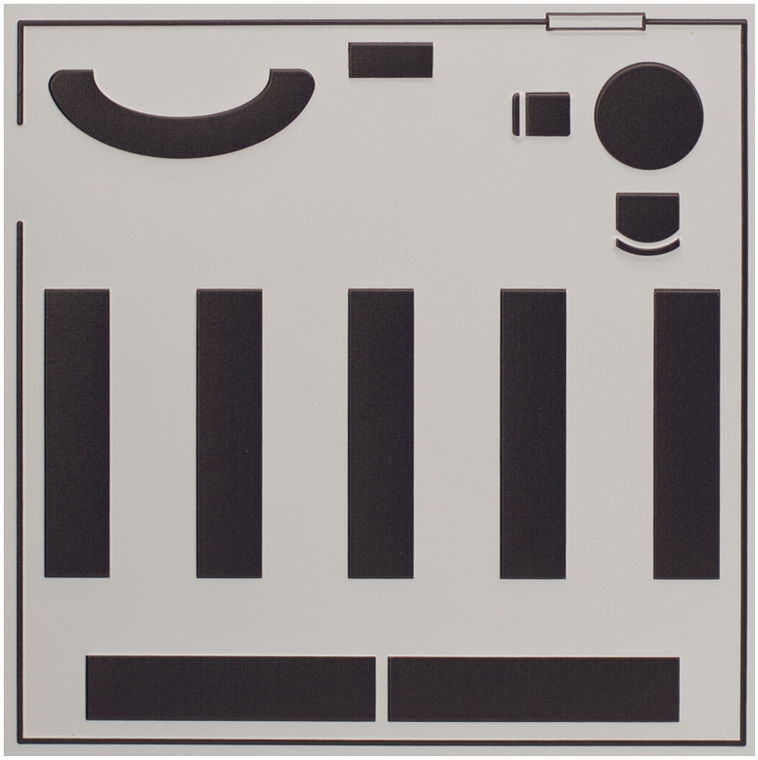


LAYOUT 11

Library/Bookstore

RWAV Materials

- 2D Layout 11
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (1) straight-backed chair
- (1) curved-backed chair
- (1) round table
- (1) small bookshelf
- (7) large bookshelves
- (1) service counter
- (2) 3D figures
- (1) computer screen
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts



Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D room on one half of the felt board. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and window should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall. The instructor should encourage the student to independently locate and link the four foam walls to build a room that matches the 2D layout design. Provide assistance as needed.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize that each shape within the 2D layout represents the top view of

each piece of furniture or room feature. The underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.

Focusing on Details

With the exception of the service counter, the library/bookstore uses the 3D models encountered in previous RWAV 2D layouts. Revisit and emphasize the following details of the 3D models.

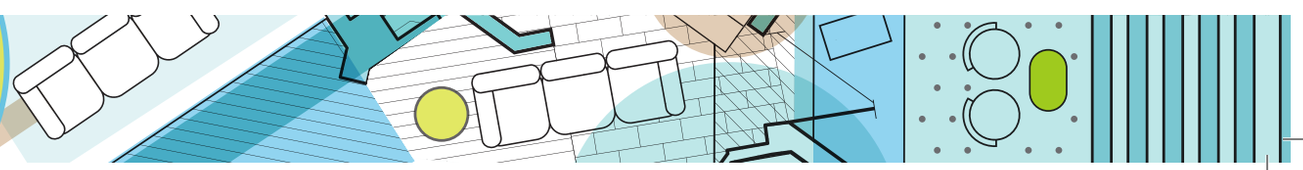
- The higher back of the straight-backed chair and curved-back chair is represented by a raised line that sits higher than the raised area that represents the chair seat. The separated line assists in identifying the directionality of each chair within the room layout.

- The top view of each large bookshelf is represented by a rectangular shape that is noticeably larger than the rectangular shape that represents the small bookshelf. Be sure to have the student compare the two sizes of bookshelves.
- Explore the 3D model of the service counter. Although the service counter is similar in length to that of the large bookshelf, its curved shape helps distinguish it from other RWAV 3D models. The shape also communicates directionality within both the 3D setting and the 2D layout.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- If the window represents the *north side* of the library/bookstore, in which *corner* is the round table? (*northeast*)
- Locate bookshelves that are *parallel* to each other.
- Locate bookshelves that are *perpendicular* to each other.
- Locate bookshelves that are *against* or *next to* a wall.
- Locate the chair *facing* the window.
- Locate the chair *nearest to* the service counter/desk.
- If the window represents the *northside* of the library/bookstore, in which *corner* is the entrance? (*northwest*)
- Locate the bookshelf that is directly *across from* the small bookshelf?
- Locate the bookshelf in the *center* of the bookstore/library.



Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- Position a 3D person (salesperson/librarian) *behind* the service counter.
- "Walk" a 3D person (customer) *into* the bookstore/library (*through* the door entrance), locate the service counter, and *face* the salesperson/librarian *behind* the service counter.
- "Walk" a 3D person from the service desk *down* one of the aisles and *toward* the two bookshelves in the *back of* the bookstore/library.
- "Walk" the 3D person (customer) *up and down* the four aisles, moving *left to right* from one *side* of the room to the *other*.
- Place the chairs *across from/opposite* each other.
- Place the computer screen *on top of* the *round* table.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Have the student alternate pretending to be the salesperson/librarian behind the desk and the customer facing the service counter. From each adopted perspective, have the student describe the location of various features in the bookstore/library. For example, the *round* table to the customer's *right* and the salesperson's *left*.

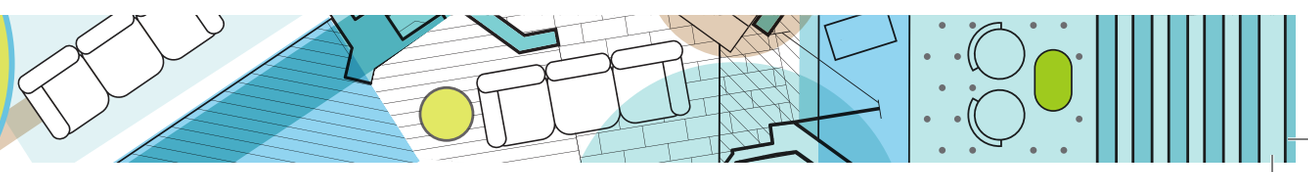
Creative Approaches

Utilize both sides of the felt board to create a larger bookstore/library using additional walls as in Layout 12 and Layout 13. Encourage the student to create a novel room arrangement/design using additional RWAV pieces. After they build the larger bookstore/library, have them formulate questions on their own that incorporate spatial terms. They can then assume the instructor role and pose the questions to their teacher or peers.

Encourage the student to create a tactile map of their school library. Create braille/print labels to place within the map. An assortment of RWAV models, paired with additional hook-backed pieces from other available products (e.g., Picture Maker), can be used to construct the map.

Real Room Experiences

Visit a library or bookstore. Compare the RWAV map to commonplace features usually encountered in these real settings. Bookstores and libraries will be far more complex than the RWAV layout. For example, there are usually numerous bookshelves, separate reading areas/nooks, multiple service desks, etc. Review a variety of spatial concepts within the actual library or bookstore. For example, have the student walk *between* aisles; locate the *lowest/bottom* shelf; find bookshelves that are *parallel* or *perpendicular* to each other; locate the bookshelves *farthest from* the service counter/desk, etc.

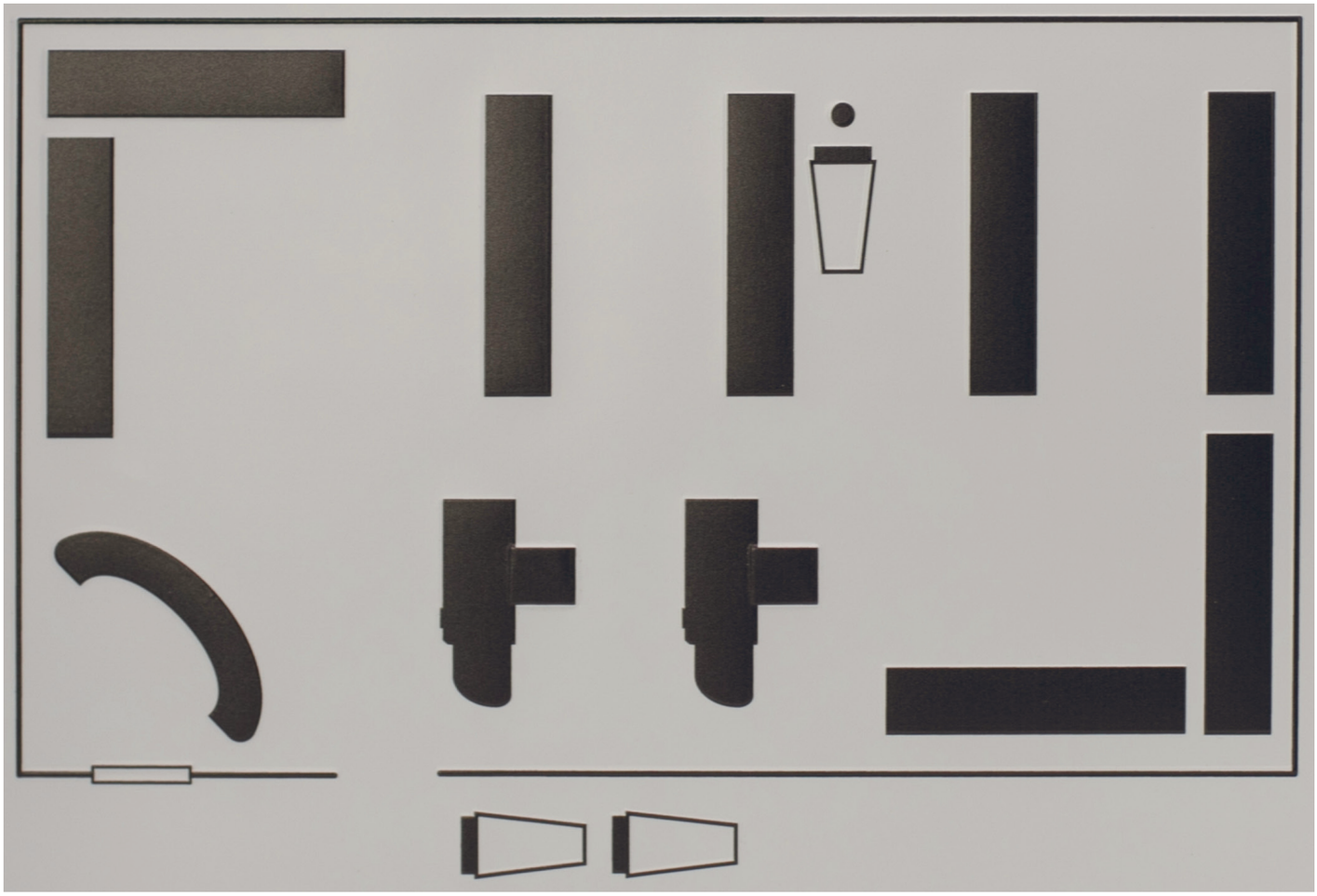


LAYOUT 12

Large Grocery Store

RWAV Materials

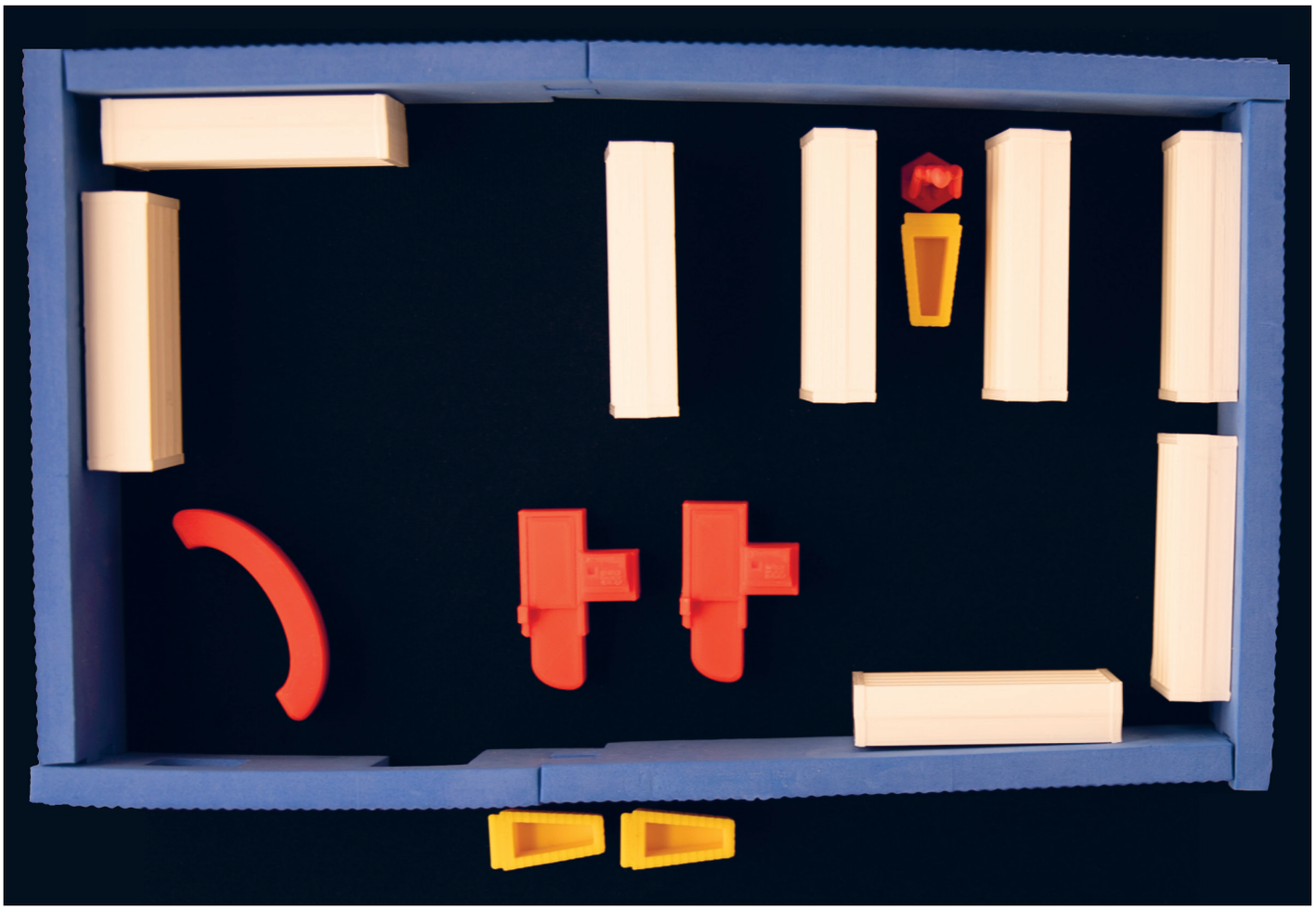
- 2D Layout 12
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (2) 5.5-in. foam (short) walls—one with only a door and one without door/windows.
- (8) large bookshelves/grocery shelves
- (3) shopping carts
- (2) checkout counters
- (1) service counter
- (3) human figures
- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts



Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the 3D grocery layout on the felt board. Important: This layout will span both sides of the felt board and require six individual foam wall sections (four long and two short) to build the large grocery store. The student will likely need assistance building this larger-scale layout. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. The position of the door entrance and window should match those represented in the 2D layout. Remember that the textured side of the foam wall represents the exterior wall, and the reverse smooth side represents the interior wall.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize that each shape within the 2D layout represents the top view of each piece of furniture or room feature. The underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the room constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

Revisit grocery store features that were reviewed in Layout 10, especially the large grocery shelves, checkout counter, and shopping carts. The service counter, previously encountered in Layout 11, is re-introduced in this large-scale grocery setting. Take time to discuss the identifying and unique characteristics of all pieces encountered in the layout.

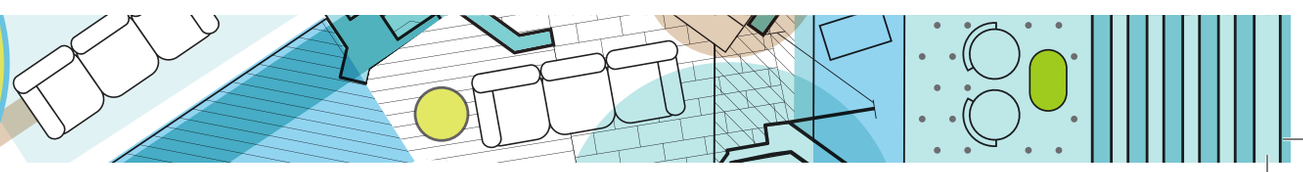
Have the student compare Layout 10 and Layout 12. Discuss how the two grocery store settings are different from each other. Examples of possible differences may include the following:

- the overall size differences
- the number and position of grocery carts
- the number and position of checkout counters
- the width of the aisles between the grocery shelves
- the location of the entrance and windows
- the presence of the service counter

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the *front entrance* to the grocery store.
- Identify the store features that are *close to* the *front* entrance. (service desk and checkout counters)
- Locate grocery shelves that are *parallel* (or *perpendicular*) to each other.
- Locate the grocery shelf that is *farthest from* the *front* entrance.



- Locate the window *behind* the service desk.
- Locate the grocery carts that are *outside* of the grocery store.
- If the store entrance is on the *south side* of the building, where is the service counter located? (*southwest corner*) Which direction are the outside grocery carts facing? (*east*) Locate the grocery shelves on the *east side* of the grocery store.
- Is the person with the grocery cart *facing toward* the *front of* the store or the *back of* the store?

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:

- Place a 3D person (salesperson) *behind* the service desk.
- Place another 3D person (shopper) in an aisle *next to* the existing shopper. Face this shopper toward the back of the store. Place a grocery cart in *front of* this shopper.
- Position two shoppers (with their respective carts) *next to* each other in the *same* shopping aisle and *facing opposite* directions.
- Position two shoppers in the *same* checkout lane, one *behind* the other.
- Have a shopper *exit* the grocery store *through* the f*ront entrance*.
- Add another door/*exit* in the *back of* the store by adding a wall section that includes a door opening.
- Rearrange the grocery shelves to create a new arrangement (e.g., orient all of the grocery shelves in the *same* direction).

Continue to use the 2D and 3D room layouts to review other spatial

concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Randomly place three 3D shoppers with carts within the large grocery store layout. Have the student describe the surroundings from each shopper's unique perspective. For example, locate the aisle to the shopper's immediate *left*; locate the *closest* checkout counter; locate the *nearest* exit, etc.

Creative Approaches

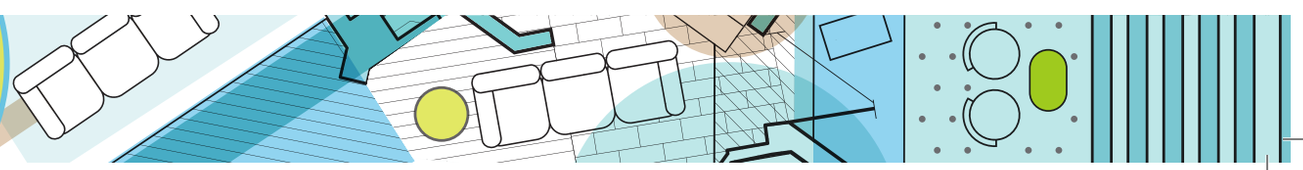
Create and apply temporary braille/print labels to main areas (e.g., dairy, produce, meat, frozen section, canned goods) of the 3D grocery store layout. Use these assigned sections to practice additional spatial terminology. For example, which section is *farthest from* the produce, *next to* the cleaning products, etc.? Be sure to identify these actual locations within a real grocery store.

Refer to additional suggestions provided in Layout 10: Small Grocery.

Real Room Experiences

Visit a variety of grocery stores/food markets of various sizes and types.

Refer to additional suggestions provided in Layout 10: Small Grocery Store.



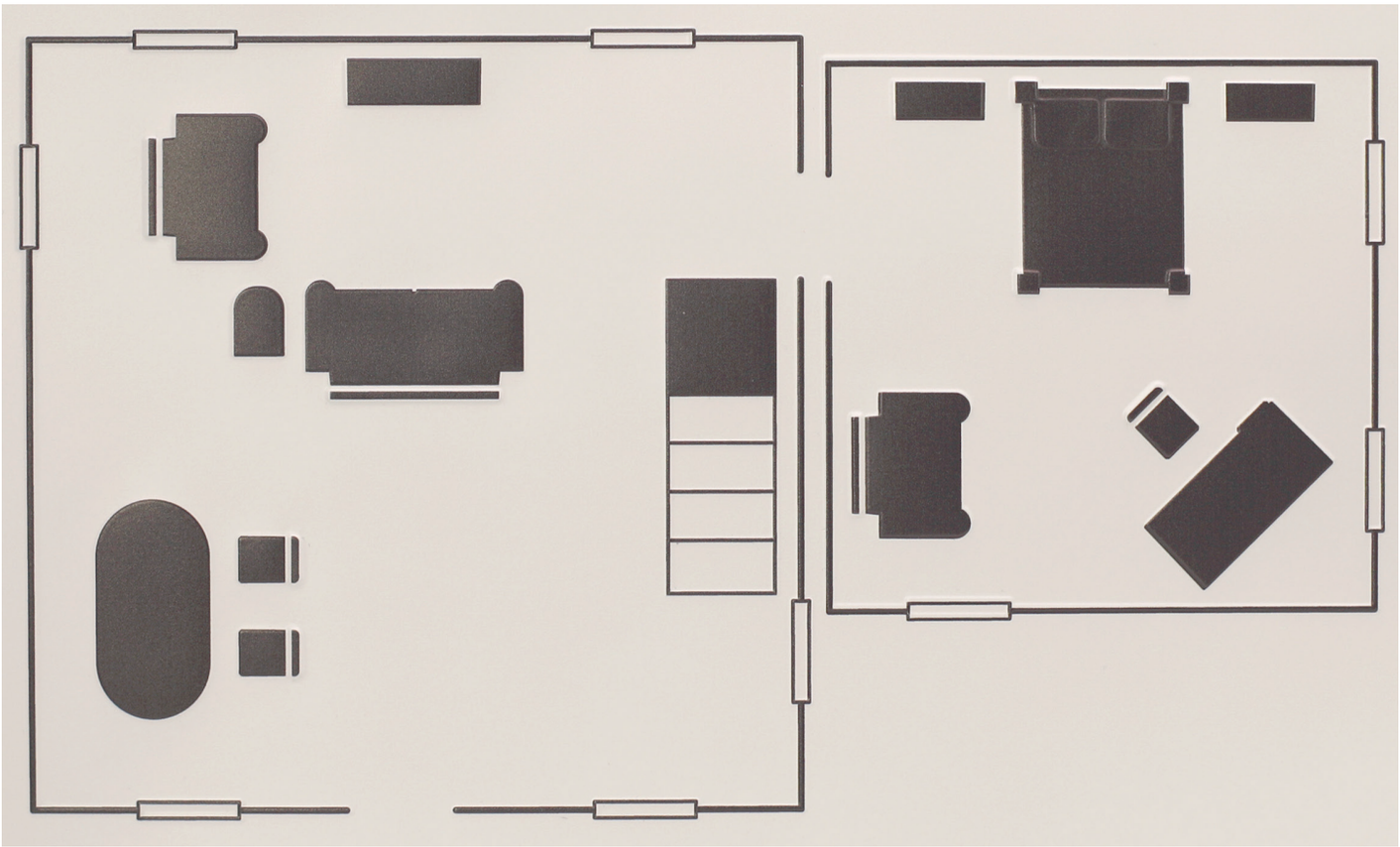
LAYOUT 13

Two-Room Layout

RWAV Materials

- 2D Layout 13
- felt board
- (4) 7.5-in. foam (long) walls that match those in the 2D layout
- (4) 5.5-in. foam (short) walls that match those in the 2D layout
- (1) couch/sofa
- (2) armchairs
- (1) end table
- (1) oblong table
- (1) fireplace
- (1) staircase
- (1) bed
- (1) flatscreen TV
- (2) chest of drawers
- (1) office desk
- (3) straight-backed chairs
- (3) human figures

- Additional RWAV 3D parts as determined by the instructor and used by the student to embellish the existing layout and demonstrate additional spatial concepts

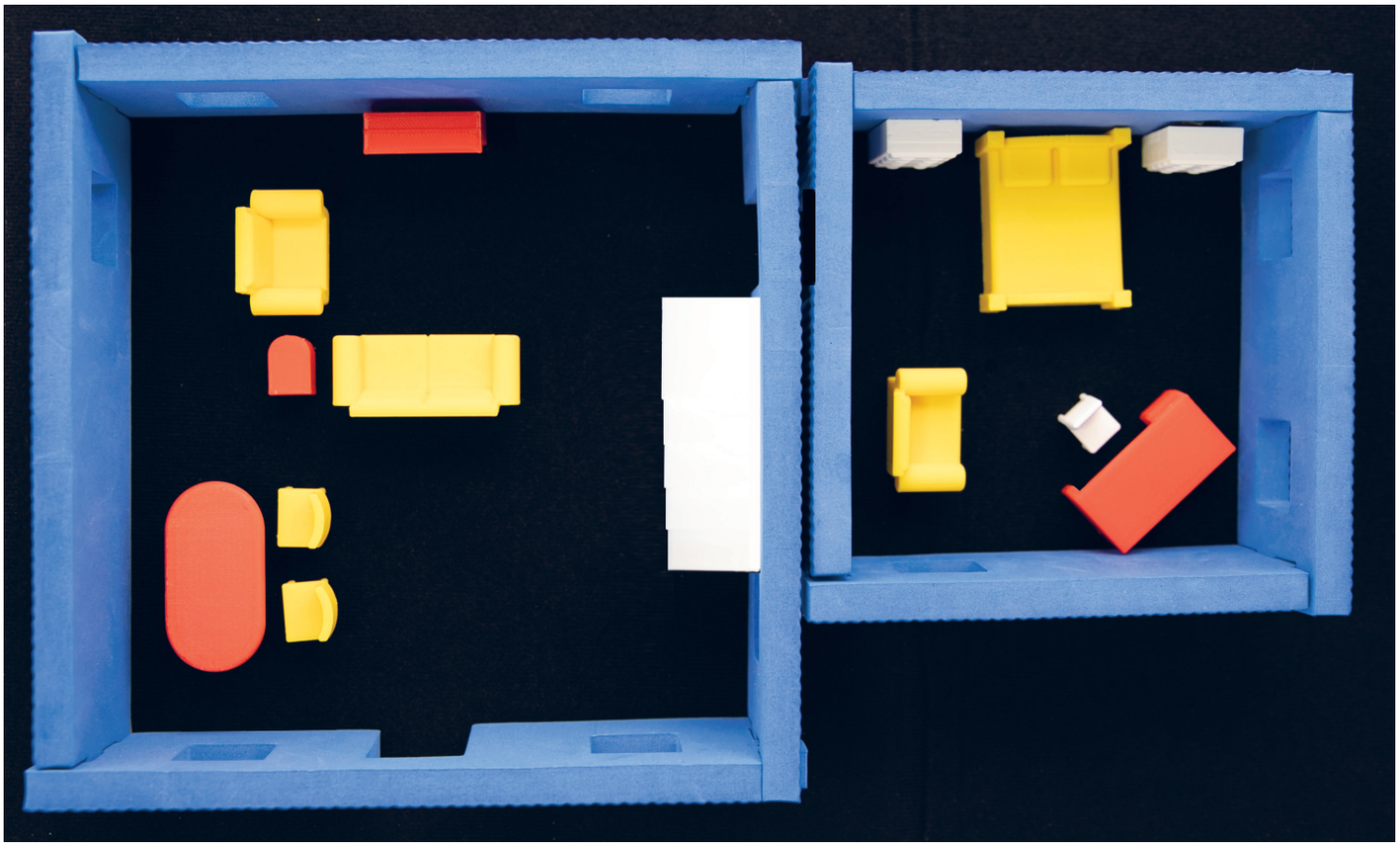


Initial Orientation/Setup

Using the 2D room layout as a reference, construct the walls of the living room and bedroom layout on the felt board. Important: The 3D layout will span both sides of the felt board and require eight individual foam wall sections (four long and four short) to build the two-room layout. Build the living room and bedroom separately, then place them against each other by aligning the doorways. The student will likely need assistance building this larger-scale layout. Remind the student that a door entrance on the 2D layout is represented by a gap or space in a wall line. In contrast, a window is represented by a rectangular raised outline centered on a wall line. Remember that the textured side of the foam wall represents

the exterior wall, and the reverse smooth side represents the interior wall.

After the foam walls are constructed on the felt board, provide the student with the corresponding 3D models encountered in the 2D layout. Allow older students to search among a larger collection of models and identify needed pieces for the layout. Emphasize that each shape within the 2D layout represents the top view of each piece of furniture or room feature. The underside of each 3D model will have hook material that will assist with directionality—top versus the bottom of the piece. Place each 3D model directly on top of its corresponding shape within the 2D tactile layout. Then have the student transfer the 3D models to the rooms constructed on the felt board (defined by the linked walls) and arrange the models to match the same layout shown within the 2D layout. Provide assistance as needed.



Focusing on Details

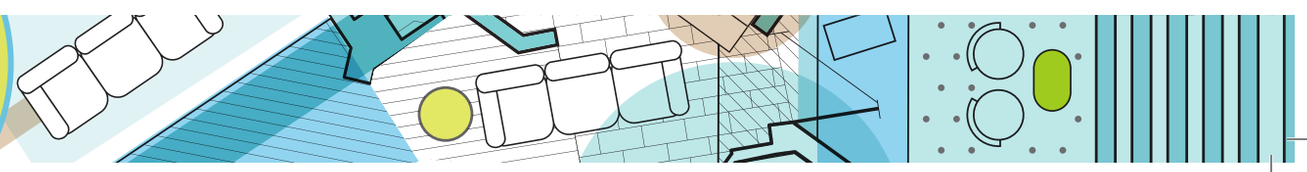
Revisit features of the living room and bedroom that were reviewed in Layout 3 and Layout 4. Take time to discuss the identifying and unique characteristics of all 3D pieces encountered in Layout 13 and how they are shown in the 2D layout.

Spatial Concepts and Skills

Use the 2D room layout to practice a variety of spatial skills and concepts. For example, ask the student to do the following:

- Locate the doorway shared by the living room and the bedroom.
- Locate two chairs that are *next to each other* and *facing* the same direction.
- Which piece of furniture in the living room is *across from* the fireplace?
- If the bed's headboard is *against* the *north* wall, in which *corner* of the bedroom is the armchair? (*southwest corner*)
- Which piece of furniture is *diagonally* positioned within the bedroom?
- Locate the *lowest* step of the stairs.
- Within the living room setting, locate the room feature that is *between* two windows.
- Which chest of drawers is *closest to* the *entrance* to the bedroom?
- Is the end table to the *right* or to the *left* of the couch/sofa?

Use the 3D room layout to practice spatial skills and concepts; incorporate pretend play activities. For example, instruct the student to do the following:



- Within the living room, place a 3D person *in front of* the armchair.
- "Walk" the 3D person from the living room *into* the bedroom.
- Position a 3D person *on* the staircase landing.
- "Walk" a 3D person *down* the stairs and *toward* the *front entrance* of the living room.
- Add another end table to the *other side* of the couch/sofa.
- Have a 3D person stand *beside* the bed.
- Place a computer monitor *on top of* the desk in the bedroom and a TV *on top of* the fireplace mantle in the living room.

Continue to use the 2D and 3D room layouts to review other spatial concepts listed in the "Checklist of Concepts" provided in this activity guide.

Change of Perspective

Place a 3D person within each room—one in the living room and one in the bedroom. Ask the student to describe each person's location relative to other items in the room using a variety of spatial terms

Revisit the 2D Perspective layout showing the top view and side view of the office desk, stairs, and bed. Have the student orient each 3D model to match its 2D side-view and top-view counterparts.

Creative Approaches

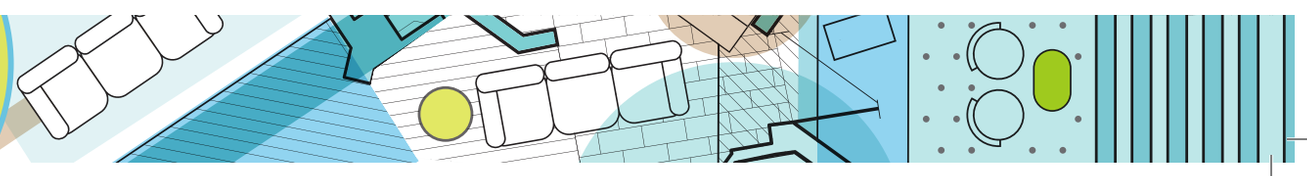
Have the student create different two-room arrangements using RWAV 3D models. These layouts might show adjacent rooms found in a school, store, or home setting.

Juxtapose the living room settings shown in Layout 3 and Layout 13 and allow the student time to compare and describe the differences.

Likewise, encourage the student to compare and describe the bedroom settings shown in Layout 4 and Layout 13.

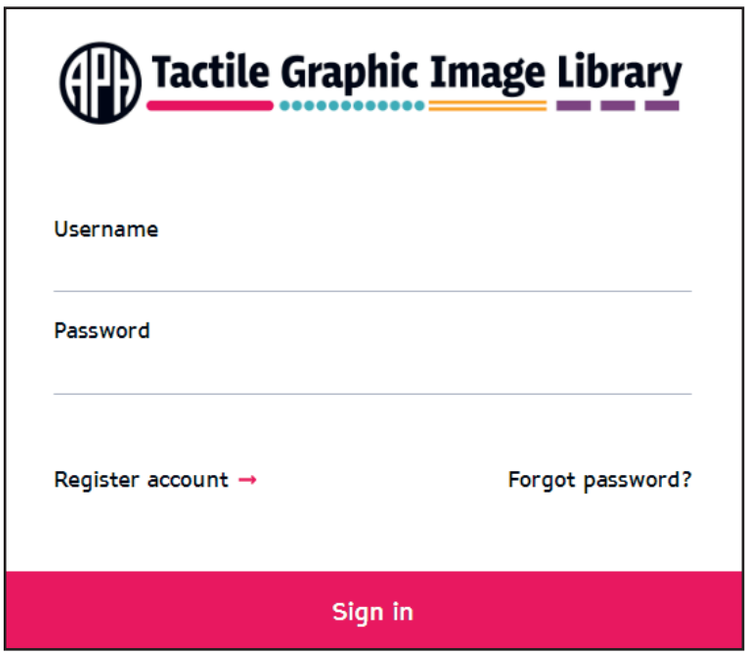
Real Room Experiences

Within a home, classroom, or office setting, allow a student to walk from one room through a doorway into another adjoining room. Construct a two-room layout using the RWAV 3D pieces to closely approximate the actual multi-room setup. Embellish the setting with additional hook-backed room features. Have the student use a 3D person to represent themselves within the room layout and use spatial terms to describe their position and travel paths relative to features within the room.



RWAV Template

Use the Room with a View (RWAV) vector template to digitally customize your own room layouts using the same room features and wall styles encountered in the RWAV 2D layouts. The RWAV template (in both 8.5 x 11 and 11 x 17-in. sizes) can be downloaded for free from APH's online Tactile Graphic Image Library (TGIL). The TGIL is an online database of tactile graphic templates that can be used as starting points for creating custom tactile graphics. If you have an existing TGIL account, simply log in with your username and password. If you have not registered, click "Register account" to begin the registration process. Registration is free. The TGIL can be accessed using the following link: imagelibrary.aph.org/aphb



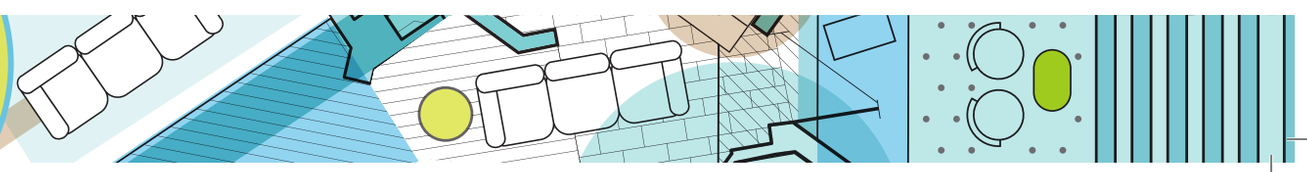
Once you have entered the TGIL, find the RWAV template within the "Orientation and Mobility" category. Two templates are available—8.5 x 11 and 11 x 17. Click one of the RWAV templates to open its preview, and then click the "Download Image" button at the bottom of the page. The RWAV template SVG file will be downloaded, and you can save it on your personal computer.

To edit the RWAV template, open it in a vector graphics program such as CorelDRAW® or Adobe Illustrator®. This tutorial uses the program, Inkscape®; it can be downloaded for free at inkscape.org. On the Inkscape main page, click the "Download" button to connect with the Download page. Select your preferred operating system and download the appropriate version of Inkscape to your personal computer.

After installation of Inkscape is complete, a default main page will appear, containing an 8.5 x 11-in. page at its center. To open the RWAV template, go to "File," then "Open" to locate the template where you saved it earlier. Select the template, and it will open in the main view screen, replacing the default page. Adjust the view using the Zoom tool (or the scroll wheel on your mouse). To use Zoom, select the Zoom tool from the toolbar on the left, or press its hotkey Z. You can zoom in on a part of the screen by clicking with the Zoom tool or zoom out by holding the Shift key and clicking the mouse. If you are using your scroll wheel to adjust the view, point the mouse at the location you want to adjust and hold Ctrl while scrolling. This also works with a laptop track pad; to pan the view, click the screen with the scroll wheel and drag the view.

In the center of the screen, you will see a standard 8.5 x 11-in. page. This area is the canvas for inserting 2D room features when designing 2D room layouts you want to print. Above the page is the Room with a View logo; to the right are the footprints of the various wall sections, and to the left are footprints of furniture. [This layout will vary if you select the 11 x 17-in. RWAV template.] Note: Some room features may vary in design and type from the 3D models included in the Room with a View kit.

To begin building a custom floor plan, you need to be able to select, duplicate, move, and rotate each of these wall and furniture pieces.



Selection is accomplished with the Select and Transform Objects tool at the top of the left-hand toolbar. The tool looks like a mouse pointer and its hotkey is F1. Using it, left click one of the walls. The dashed lines and arrows now surrounding the wall let you know that the object is selected. To deselect an object, simply click somewhere else on the screen.

To begin building your room, you must first select a wall. If you find you cannot select one wall by itself and are instead selecting everything on the page at once, the objects may be grouped together. Sometimes when you open a new SVG in Inkscape, all the objects will be grouped by default. To undo grouping, click on the grouped objects to select them, go up to the Object menu and click Ungroup or press Shift+Ctrl+G. Now you can move the objects individually and select the wall you want for the canvas.

Before moving the wall you have selected to the canvas, first duplicate it, so that the original will be available to you if you need another of the same type. To do this, select the wall type desired and press Ctrl+D. Now there's a copy of the wall sitting on top of the original wall. Simply click and drag the copied wall onto the canvas. In this same manner, duplicate as many walls or furniture pieces as needed for your custom room layout.

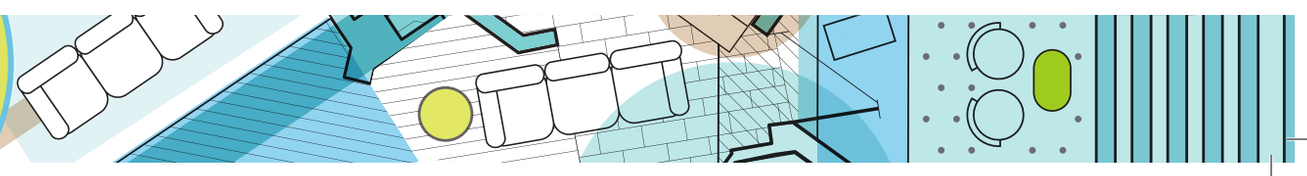
To continue building the four walls of your room, click another wall, duplicate it, and drag it onto the canvas. Then rotate the wall to form a corner of the room. With your new wall selected, click to select it a second time. You'll notice the arrows around the wall change from pointing in and out to curving; you have just changed your selection from Scale mode to Rotate mode. By clicking and dragging one of the curved arrows, you can rotate the wall to create any angle you choose. If you hold Ctrl while you do this, the rotation will snap to 15° angles. This will let you easily rotate the wall 90°.

Place the newly rotated wall so it meets the end of your first wall to form a corner.

Anything you can do to one object you can do to a whole group. Use the walls you have already placed to build the last two walls of the room. You can select them both by either clicking and dragging a selection box around both of them, or by holding down the Shift key and clicking them each in succession. Now you have a group selected. Duplicate the group with Ctrl+D and rotate it by clicking one of the objects again and using the arrows while holding Ctrl to drag it around 180°. Now you should have a complete room with four walls. If you need to make minor adjustments to the wall placement, you can move selected objects with the arrow keys. Apply the same action to select and position furniture pieces within the room.

To save a room layout, go to "File" and select "Save As." Type a new name for your layout. If you plan to edit the layout later, choose Inkscape SVG. When you reopen the file, it will be just as you left it. If you want to format the file for printing, it is usually best to export the file as a PDF. To do this, go to "File" and select "Save As." In the "Save As" dropdown, select "Portable Document Format." Now your layout will be saved in a format acceptable to most printers and graphic embossers.

For students with low vision, use your printed room layout as is, or as a master for creating a tactile collage of the room. You can also print the layout on microcapsule paper.

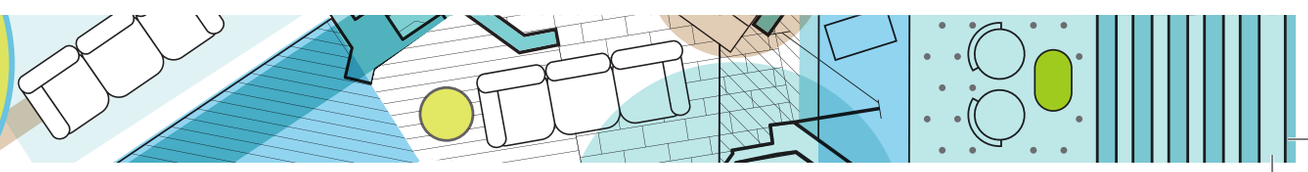


Checklist of Concepts

Use this Checklist of Concepts as a reference to introduce and practice various concepts during the student's exploration of a **Room with a View** layout or a room layout created by the teacher or student. Incorporate and address as many concepts as appropriate for each layout based on the individual student's learning needs.

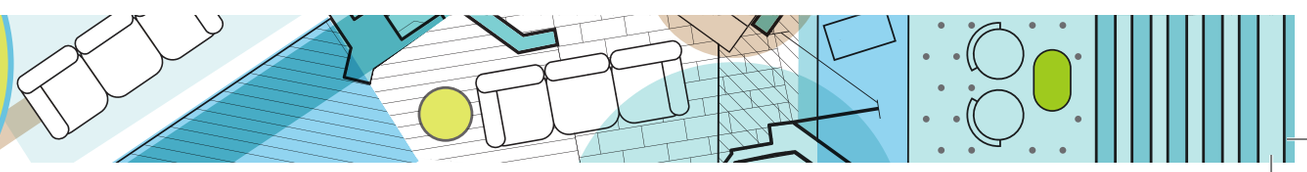
Comparison
Different (in size, shape, position, arrangement)
Fewer vs. more
First, second, third, last…
Inner vs. outer
Missing/absent vs. present
Rough vs. smooth
Same/similar (in size, shape, position, arrangement)
Start/beginning vs. end/ending
Textured vs. smooth
3D vs. 2D
With/without
Direction
Clockwise
Compass directions (N, S, E, W, NE, NW, SW, SE)
Counterclockwise

Diagonal
Enter
Exit
Face away from
Face toward
Left to right/right to left
Move away from
Move sideways
Move toward
Opposite direction
Reverse
Turn/rotate
Perspective
Front view
Inner vs. outer
Interior vs. exterior
Side view
Top view/bird's-eye view/aerial view
Shape
Angle
Circular



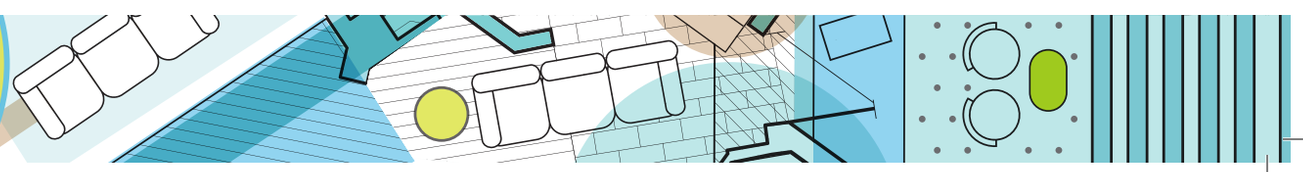
Curved
Level/flat/even
Line
Long
Narrow
Oblong
Outline shape
Raised dot/symbol
Raised surface
Recessed
Rectangle
Round
Rows
Short
Sloped/slanted
Solid shape
Square
Straight
Thin/narrow
Thick/wide
Triangle

Size
Large
Short
Small
Tall
Thick/wide
Thin/narrow
Position
Above
Across from
Adjacent
Against
Apart
Around
Back of (chair, desk, ...)
Backward
Behind
Below
Beside
Between
Bottom



Center
Centermost
Closest
Concave
Corner
Diagonal
Down
Enter/entrance
Exit
Facing away from
Facing toward
Far/farthest from
Forward
Front of (table, desk, …)
Gap/space
Higher/taller
In front of
Inside/within
Into
Left of
Lower surface/base
Middle

Near/nearest to
Next to
Off
On/on top of
Opening
Opposite
Other side
Out
Outside
Over
Parallel
Perpendicular
Right of
Right-side up
Separated/divided
Side of object/room
Side-by-side
Sideways
Through



Together
Top
Toward
Under
Underneath
Underside
Up
Upper surface
Upside down

Related Products

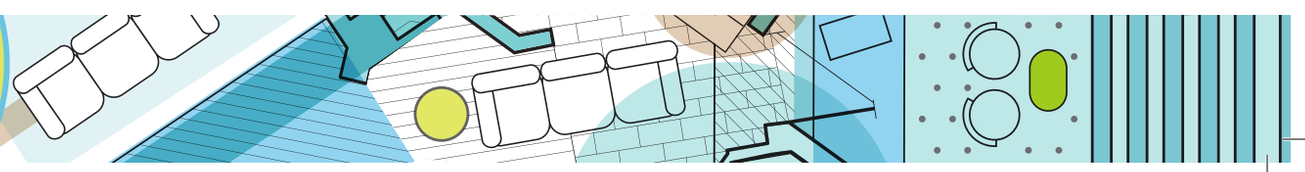
APH Products

The following APH products may be used in combination with **Room with a View** to promote the development of spatial concepts and understanding, orientation and mobility skills, and tactile map construction and interpretation.

- DRAFTSMAN Tactile Drawing Board (Catalog No. 1-08857-00)
  - ◇ Tactile Drawing Film (Catalog No. 1-08858-00)
- Graphic Art Tape (Catalog No. 1-08878-00)
- Picture Maker: Wheatley Tactile Diagramming Kit (Catalog No. 1-08838-00)
  - ◇ Picture Maker: Geometric Textured Shapes (Catalog No. 1-08838-01)
  - ◇ Picture Maker: Textured Strips (Catalog No. 1-08838-02)
- Quick-Draw Paper (Catalog No. 1-04960-00)
- SENSEable STRIPS: Stick-On Tactile Lines (Catalog No. 1-03051-00)
- TactileDoodle (Catalog No. 1-08824-00)
- Tactile Town: 3-D O&M Kit (Catalog No. 1-03135-00)
- Tactile Treasures: Math and Language Concepts for Young Children with Visual Impairments, Tactile-Color Edition (Catalog No. 1-08842-01)

Commercial Products

The following products, not available from APH, can supplement the use of **Room with a View**:



- Commercially available art tape, textured papers, fabric, craft foam, waxed string, etc., can be used by teachers and students to create and embellish their tactile room layouts. Art supply stores are great resources for a variety of collage materials.
- Microcapsule paper and fusers are available from the following sources and can be used to generate tactile raised-line drawings of room layouts from layouts designed using the RWAV Template on APH's Tactile Graphic Image Library [refer to the related chapter in this activity guide]:
  - ◇ **American Thermoform**
    americanthermoform.com/product/swell-touch-paper
  - ◇ **Humanware**
    store.humanware.com/hus/tangible-magic-capsule-paper-8-in-x-11-in-100-sheets-package.html

Related Reading

Lewis, V., Collis, G., Shadlock, R., Potts, M., & Norgate, S. (2002). New methods for studying blind children's understanding of familiar space. *British Journal of Visual Impairment*, *20*, 17-23.

Potter, L. E. (1995). Small-scale versus large-scale spatial reasoning: Educational implications for children who are visually impaired. *Journal of Visual Impairment & Blindness*, *89*(2), 142-152.

Spencer, C., Morsley, K., Unger, S., Pike, E., & Blades, M. (1992). Developing the blind child's cognition of the environment: The role of direct and map-given experience. *Geoforum*, *23*(2), 191-197.

Unger, S., Blades, M., & Spencer, C. (1995). Visually impaired children's strategies for memorising a map. *British Journal of Visual Impairment*, *13*(1), 27-32.

Unger, S., Blades, M., & Spencer, C. (1996). The ability of visually impaired children to locate themselves on a tactile map. *Journal of Visual Impairment & Blindness*, *90*, 526-535.

Unger, S., Blades, M., Spencer, C., & Morsley, K. (1994). Can visually impaired children use tactile maps to estimate directions? *Journal of Visual Impairment & Blindness*, *88*(3), 221-233.

Wiener, W. R., Welsh. R. L., & Blasch, B. B. (Eds.). (2010). *Foundations of orientation and mobility: Volume I history and theory* (3rd ed., Vol. 1). American Foundation for the Blind Press.

Wiener, W. R., Welsh, R. L., & Blasch, B. B. (Eds.). (2010). *Foundations of orientation and mobility: Volume II instructional strategies and practical applications* (3rd ed., Vol. 2). American Foundation for the Blind Press.

Proper Trademark Notice and Attribution

Adobe Illustrator® is a registered trademark of Adobe Inc.

CorelDraw® is a registered trademark of Corel Corporation.

Inkscape® is a registered trademark of Software Freedom Conservancy, Inc.

Room with a View is an interactive kit that can be used to introduce a variety of map-reading concepts and skills to students who are blind or low vision. The kit includes the following items:

- Linkable foam walls
- Ceiling and roof
- Realistic 3D models (tables, chairs, desks, bookshelves, bed, sink, oven, stairs, etc.)
- 2D tactile/print layouts of various indoor settings (classroom, kitchen, grocery, bedroom, living room, office, library, bathroom) and perspective layout
- Foldable felt board to serve as a platform for constructed room layouts
- Activity guide
- Carrying/storage box

AMERICAN PRINTING HOUSE

1839 Frankfort Avenue
Louisville, Kentucky 40206
502-895-2405 · 800-223-1839
aph.org · info@aph.org

Room with a View: Map-Reading Concepts and Skills

Catalog Number
1-03136-00