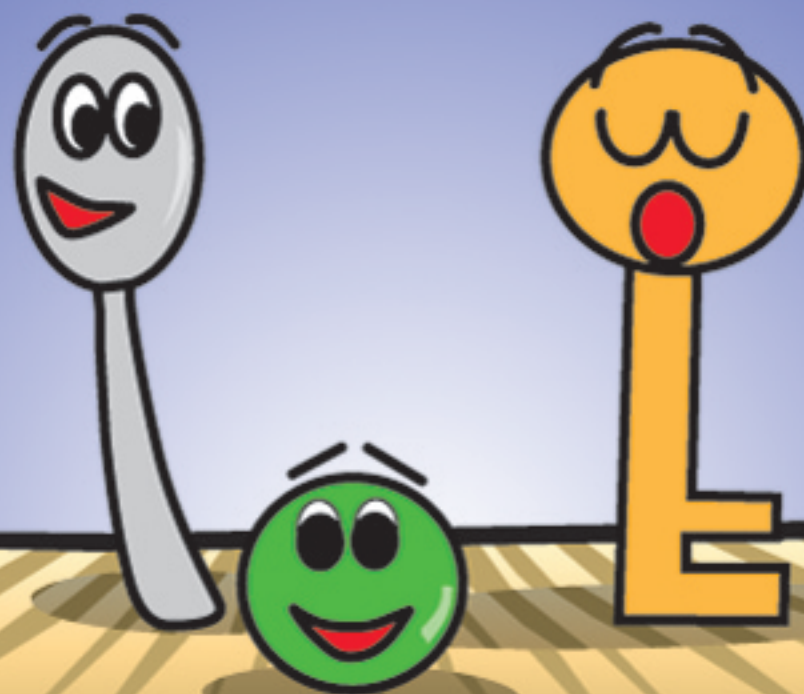


Setting the Stage

for

Tactile Understanding





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The image features a stylized illustration of a stage. Pink curtains with grey outlines and yellow ties are pulled back to reveal a blue background. The floor is a light yellow color with grey lines radiating from the center. The text "Overture: Introduction" is centered in the blue area.

Overture:

Introduction



OVERTURE



Introduction

Setting the Stage for Tactile Understanding is a set of materials that serves as a tool for encouraging and informally assessing the development of early tactile literacy in young children who have visual impairments and blindness. The tangible items and activities included in this kit are intended to assist young tactile readers in making the transition from the exploration of real objects to the interpretation of two-dimensional representations, both in thermoformed formats and simple raised-line illustrations. Advanced understanding of scale adjustments and perspective is also encouraged with the use of a specially designed three-dimensional model.

Learning to interpret tactile pictures is not comparable to recognizing and identifying visual illustrations. A child's ability to find tactile graphics meaningful and beneficial requires practice and repeated exposure to a variety of raised-line pictures over time. Learning how to successfully "read" tactile displays will prove necessary for the tactile reader in many ways down the road. Activities such as completing simple classroom worksheets, taking standardized tests, using maps and graphs, enjoying recreational materials, and appreciating and creating art are

only a few examples. *Setting the Stage for Tactile Understanding* can be used as an initial step towards tactile literacy.

The suggested activities in *Setting the Stage for Tactile Understanding* promote a child's development of the following skills and concepts:

- 1) *Awareness of Tactile Quality*: The child needs to have direct contact with a variety of textures and shapes. Firsthand and concept-rich experiences with real objects should be encouraged.
- 2) *Shape Recognition of Part-Whole Relationships*: The child needs to actively handle and manipulate real objects, noting identifying features and understanding how separate parts are pieced together to form a whole.
- 3) *Understanding Graphic Representation*: The child needs to understand how an abstract representation or symbol (e.g., a raised-line drawing) can stand for something real.
- 4) *Hand Skills/Exploratory Skills*: The child needs to acquire exploration strategies (e.g., tracing edges and contours while maintaining a reference point) and approaches to skimming a graphic in a methodical fashion (e.g., top to bottom, left to right).

Dr. Phil Hatlen, Superintendent of the Texas School for the Blind, states in APH's 2004-2005 Products Catalog that experiences and concepts casually and incidentally learned by sighted students must be systematically and sequentially taught to the visually impaired student through an expanded core curriculum. *Setting the Stage for Tactile Understanding* presents a systematic way of bridging a young child's experience of familiar objects — a ball, a key, a cup — to the exploration of tactile representations.



Included chapters present the following path of tactile introductions:

SHOWTIME: Familiarizes the child with a dozen real objects that are commonly encountered at home. Suggested activities assist in concept development related to each included item. Essentially, it is “time to show” the child the real thing.

CENTER STAGE: Transitions the child to tactile counterparts of the provided items using molded images that maintain one-to-one size correspondence with the real objects, yet lose identifying characteristics such as texture, function, and/or overall shape.

FINALE: Finalizes the tactile leap from explorations of three-dimensional objects to the interpretation of outline or raised-line illustrations. This stage will require the child's ability to carefully trace contours and edges with his fingers versus global or whole-hand exploration.

ENCORE: Advances the child to more challenging tasks of understanding scale reductions and pairing two-dimensional drawings with various perspectives, such as top view and side view, using a 3-D model.

Setting the Stage for Tactile Understanding should be used in combination with other tactile training tools.

CURTAIN CALL: Lists many other materials that can complement the use of this kit. This kit is intended to provide a fun and positive learning experience for the child that leads to greater confidence, familiarity, and enjoyment of tactile illustrations.



Showtime:

Real Objects



SHOWTIME



Real Objects

SHOWTIME activities encourage the young child's active exploration of real objects and early concept development. This initial stage of tactile understanding begins with the child's direct handling and purposeful manipulation of objects that can be tactually perceived.

The twelve real objects included in *Setting the Stage for Tactile Understanding* were selected because they are common objects that young children encounter and become acquainted with in their own homes. These objects are also of a size that can be maintained when they are later presented in thermoformed and raised-line formats, thus encouraging the gradual transition from three-dimensional shapes to abstract illustrations without the interference or challenge of scale differences. Unlike objects and concepts outside the child's realm of tactual experience (e.g., snowflake, mountain, giraffe),



the following items can be considered “sense-able” objects because they can be directly placed in the child’s hand and perceived in their totality.

- Ball
- Block
- Comb
- Crayon
- Cup
- Key
- Puzzle Piece
- Scissors
- Spoon
- String of Beads
- Toothbrush
- Zipper

The following pages suggest activities for the real objects included in *Setting the Stage for Tactile Understanding*. The main goals of these activities are the following:

- 1) To extend the child’s understanding of a real object or concept beyond information gathered through incomplete, fragmented, or infrequent experiences.

- 2) To intentionally teach within the context of purposeful tasks the function and physical aspects of real objects.
- 3) To help the child make generalizations between tactile structures of common objects.
- 4) To help the child identify objects based upon salient features.
- 5) To “set the stage” to actively involve the young child in her exploration of other real objects not included in this kit.

Keep in mind that the activities listed in this chapter are merely examples. Feel encouraged to expand upon the ones listed or to be selective about their use with an individual child.

Important Note: Some children with developmental delays might tend to mouth the real objects included in this kit. Therefore, adult supervision is recommended during the objects’ use. All of the provided real objects should be regularly cleaned and disinfected, especially before using them with other students.

Ball

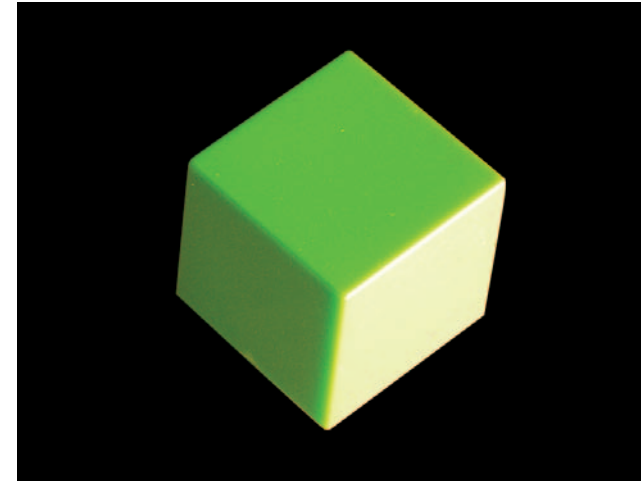
- Have the child explore a variety of sports balls — tennis ball, football, soccer ball, ping pong ball, golf ball, basketball, beach ball, etc.
- Practice bouncing a ball, kicking a ball, rolling a ball, etc.
- Provide sound balls (i.e., balls that continue to make a noise when rolled).
- Demonstrate how various sports balls are bounced and thrown (e.g., bowling balls are rolled, basketballs are dribbled, a football is passed or punted, etc.)
- Explore materials that can be shaped into ball shapes (cookie dough, yarn, wadded paper, snow, etc.).
- Experiment with various types of balls to determine why some bounce and some do not. Compare the “bounce-ability” of a variety of balls. Which bounce higher?



- Visit a toy store and explore the variety of balls that are sold.
- Talk about the basic shape of a ball — round and spherical. Can the child locate other objects in her home that are round or spherical (e.g., a world globe, a candle, a pea, a tree ornament)?
- Read *Rolling Into Place*, a storybook produced by APH, that encourages the child to roll a ball along a Velcro path that leads to a surprise destination.
- Read *Bumpy Rolls Away*, a tactile storybook produced by APH, that follows the journey of a ball as it rolls down a hill, down steps, onto a sidewalk, along an alley, and into a box.

Block

- Explore blocks of various sizes, shapes, and colors.
- Explore blocks made from a variety of materials (wood, plastic, cloth, foam).
- Explore blocks that can be snapped together, nested, threaded onto a string, etc.
- Have the child stack blocks and build a variety of structures.
- Use APH's *Large Textured Block* or *Textured Matching Blocks* for early texture discrimination tasks.
- Count the sides of a block. Using adhesive stickers, label each side of the block with a braille number as the sides are counted.
- Use the block included with *Setting the Stage for Tactile Understanding* as an example of a “cube” — a shape with 6 equal sides.



- Compare the cube or block to other geometric forms such as the sphere, cylinder, pyramid, prism, and cone. Demonstrate the shape that each makes when its base or face is pressed into clay or playdough. A sphere makes a circle, a pyramid makes a square or triangle, etc.
- Note that each side of the block is a square. Can the child find other square shapes in his home?
- Provide a variety of blocks differing in size, shape, or texture for the child to build and design patterns.
- Create homemade blocks from sponges, cereal boxes, storage boxes, video or cassette holders, scraps of wood with the edges and surfaces sanded smooth, etc.
- Mix various sorts of blocks together and have the child sort into categories (e.g., by material, by size, by colors).

Comb

Note: It is very important to use the comb included in this kit for tactual exploration only, not for functional use. Provide a personal comb for each child and discourage sharing personal items.

- Have the child explore a variety of combs — different sizes, shapes, and colors. Visit the hair care aisle in a discount/variety store and allow the child to handle an assortment of combs.
- Explore places where combs are stored — bathroom drawers, purses, and so forth.
- Compare the shape and feel of combs to the shape and feel of hairbrushes.
- Practice hand skills of grasping a comb and combing downward through one's hair.
- Allow the child to independently comb and style her own hair.
- Allow the child to comb and style someone else's hair or a doll's hair.



- Visit a hair salon and talk to stylists who fix and comb others' hair as a career.
- Demonstrate how to stroke your thumb across the teeth of a comb to produce a sound.
- Discuss the variety of materials that hair combs can be made from — plastic, metal (e.g., teasing comb), and wood.
- Review decorative or antique combs (ivory combs, tortoise-shell combs, etc.)
- Review basic concepts using a variety of combs (e.g., *wide* teeth versus *narrow* teeth).
- Go shopping and allow the child to select his personal comb. Stress the importance of not using another person's comb just as you would not use others' toothbrushes.
- Review the daily routine of grooming (brushing teeth, washing face, combing hair, etc.).
- Talk about inappropriate times to comb one's hair (e.g., at the dinner table).
- Explore grooming tools or combs intended for animals (horses, dogs, cats).

Crayon

- Allow the child to make pictures or practice handwriting skills using crayons with the *Tactile Marking Mat* (available from APH). Allow the child to just “scribble” and enjoy the process of coloring.
- Have scented crayons available for the child’s use.
- Use capsule paper and a Tactile Image Enhancer or Swell-Form Machine [see **Resources** on page 105] to make duplicates of the line drawings included in *Setting the Stage for Tactile Understanding* or of other simple drawings. The child can then use the raised-line duplicates as coloring pages.
- Make your own raised-line coloring pages by outlining a simple shape (e.g., butterfly) with puff ink or by punching dots with a stylus on the reverse side of the paper. The child can then color between the raised lines.



- Label crayons with braille stickers or adhesive labels. [Note: Crayola® Crayons Anti-Roll® have a flat side that can be labeled with braille.] Twistable crayons are ideal for young children who are likely to break smaller, standard crayons.
- For beginners, secure a plastic stencil to the top of a sheet of paper with tape and then allow the child to color within the open area. A variety of stencils (e.g., apple, ice cream cone, sock) are available in APH's *Crafty Graphics Kit*. Many other stencils are available at local craft stores.
- Read *Jennifer's Messes* from APH's *On the Way to Literacy* tactile storybook series.
- Read *The Crayon Box that Talked* by Shane Derolf and Michael Letzig (Illustrator), Random House Children's Books, 1997, or *Harold and the Purple Crayon* by Crockett Johnson, HarperTrophy Books, 1981.
- Discuss what crayons are made from [wax and pigment]. Ask the child what would happen to crayons if exposed to heat [they melt]. Conduct a simple experiment that demonstrates to the child how a solid object, like a crayon, can turn into liquid if exposed to heat. Note also that crayons can break rather easily.

- Investigate when the first crayon was invented. [In 1903, Edwin Binney and C. Harold Smith sold their first box of eight Crayola crayons.] Source: <http://www.ideafinder.com>
- Visit a toy store, craft store, or discount store to see how crayons are packaged, as well as the various types (fluorescent, glitter, etc.) of crayons that are available.
- Read aloud the names of various crayon colors — apricot, copper, lemon yellow, sea green, carnation pink. Group similar colors of crayons together.
- Visit Crayola's Web site (<http://www.crayola.com>) for a variety of coloring activities and craft ideas.
- Obtain tactile coloring books like those published by APH (e.g., *Lots of Dots*) or Exceptional Teaching Aids, Inc. [see **Resources** on page 105]
- Emphasize the importance of not coloring on walls, furniture, clothing, books, etc.

- Ask the child to conduct a simple survey of her friends' or relatives' favorite crayon color.
- Compare crayons to other drawing tools (markers, colored pencils, paints, etc.).

Cup

- Have the child explore a variety of cups — different sizes, shapes, and colors.
- Explore where cups are usually stored in the home.
- Discuss places you would likely find cups (e.g., kitchen cabinet, restaurants, concession stands, near water fountains, etc.)
- Nest or stack various types of cups.
- Wash and dry unbreakable cups.
- Identify parts of a cup — rim, base, handle(s).
- Compare all sorts of drinking containers — cups, glasses, tumblers, mugs, goblets, etc., and discuss their structural differences.



- Allow the child to assist in measuring a cupful of milk, sugar, flour, etc., while cooking. Emphasize that not all cups that we drink from actually measure a standard cup and that we use “measuring cups” to ensure amounts when following recipes.
- Discuss if some drinking containers are more suited for hot drinks (e.g., mugs for hot chocolate) or cold drinks (e.g., glasses for iced tea).
- Compare re-useable cups (ceramic tea cups) to disposable cups (paper, plastic, Styrofoam).
- Explore other ways that cups can be used (e.g., as a scoop, to cut circular cookies out of dough, as a plant container, etc.).
- Demonstrate what it means to “cup” one’s hands.

Key

Note: Adult supervision is recommended while conducting the following activities with young children.

- Have the child explore a variety of keys — different sizes, shapes, colors, and materials (metal vs. plastic, baby keys, car keys, door keys).
- Explore places where keys are found — suitcases, money safes, purses, under doormats, gym lockers, key ring, pockets, etc.
- Visit a hardware store and explore the various types of locks and keys available (e.g., padlocks). Have a key duplicated.
- Visit an antique store or museum to view and handle various types of old keys (e.g., skeleton keys).



- Have the child practice fine motor skills by opening and unlocking doors, suitcases, etc., using a variety of keys. Emphasize how keys need to be inserted and turned in a specific direction to work properly.
- Read *Something Special* from APH's *On the Way to Literacy* tactile storybook series.
- Read *Nate the Great: The Missing Key* by Marjorie Weinman Sharmat and Marc Simont (Illustrator), published by Yearling Books, 1982.
- Have the child count the number of keys on his mom's or dad's key ring and identify the purpose of each (e.g., to start car, to open house door, to enter their work office).
- Encourage the child to use adjectives to describe various keys or parts of keys — *flat, jagged, metal, long, sharp, notched*, etc., as they actually handle them.
- Provide an assortment of keys that the child can sort or group according to certain features or functions (size, types of things they open, etc.).
- Have the child identify things of his own that he feels are important to protect (favorite toys, coin collection, jewelry box, diary, etc.).

- Explore other security devices — garage door openers, hotel card key, combination lock, etc.
- Discuss other ways doors can be locked (turning a knob on a bedroom door).
- Review other meanings in which the word “key” is used for locations (Florida *Keys*), instruments (piano *keys*), nicknames (Pennsylvania is the “*Keystone State*”), and proper names (Francis Scott *Key*) in our everyday language.

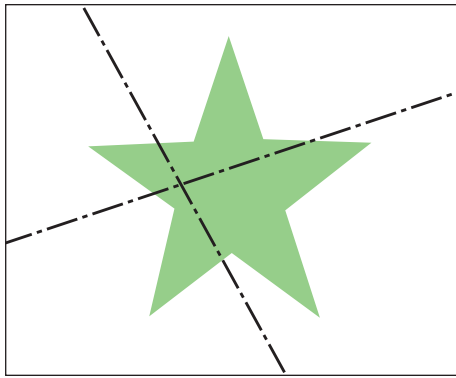
Puzzle Piece

- Using a store-bought jigsaw puzzle with a small number of relatively large pieces, request the assistance of the child to separate the pieces that have straight-edge sides from those that don't. Explain the importance of doing this sorting task (i.e., to find the pieces that will build the outside frame of the puzzle).
- Minimize the number of related pieces from a large jigsaw puzzle that a child can fit together independently. Note: Two identical puzzle pieces are included in this kit. Use these to demonstrate “puzzle-ness” by locking the two pieces together.



- Use some of the take-apart puzzles available from APH including the following:
 - *Pumpkin Puzzles* (Cat. #: 1-08835-00)
 - *Puzzle Form Board Kit* (Cat. #: 1-03721-00)
 - *U.S. Puzzle Map* (Cat. #: 1-01140-00)
- Create a homemade jigsaw puzzle. Start by producing the original image using some of the following methods, involving the child as much as possible as the creator. Cut the final “drawing” into a small number of irregular-shaped sections for the child to reconstruct like a puzzle.
 - Begin simply with a blank sheet of 8.5 x 11 inch foam sheet or cardboard panel. Cut the foam or cardboard sheet into four large sections. Let the child arrange the pieces to recreate the rectangular shape.

- Create an original “drawing” by cutting a simple shape (e.g., apple, bear, star) out of a colorful foam sheet and gluing it to a heavy cardboard backing. Cut the finished “drawing” into a small number of irregular pieces like so:



- Have the child make her own drawing on a piece of *Quick-Draw Paper* (available from APH).
- Prepare a simple outline drawing on capsule paper and feed it through a Tactile Image Enhancer[®] or Swell-Form Machine[®] (if available) to create a raised

drawing. Then cut the generated capsule-paper image into a 4-piece puzzle. Have the child put the puzzle together.

- Locate some online interactive jigsaw puzzles if the child has useable vision. Online jigsaw puzzles can be found at www.theKidzpage.com or www.jigzone.com.

- Discuss, make, and/or solve other types of puzzles such as the following:
 - Mazes
 - Word search puzzles
 - Slide puzzles
 - Rubik's cube
 - Brain teasers

Scissors

Note: Adult supervision is recommended while conducting the following activities with young children.

- Have the child explore a variety of scissors — different sizes, shapes, and colors.
- Explore places where scissors are stored — sewing box, office desk drawer, craft materials shelf, pencil case, etc.
- Visit an office supply store or a craft store where different types of scissors (e.g., decorative shaping scissors) are available.
- Demonstrate hand-over-hand (child's over adult's) how to manipulate scissors. Then have the adult place her hand on top of the child's as the child operates the scissors. Eventually allow the child to cut something independently without hand-over-hand guidance.



- Have the child practice scissor skills by performing some of the following activities:
 - Cut through a variety of papers (grocery bags, corrugated cardboard, tissue paper, laminated paper, etc.). Discuss afterwards which was easiest/hardest to cut.
 - Cut through a variety of fabrics (velvet, silk, corduroy, cotton, burlap). Discuss afterwards which was easiest/hardest to cut.
 - Cut through a variety of materials (playdough, plastic bottle, bubble wrap, textured wallpaper). Discuss afterwards which was easiest/hardest to cut.
 - Allow the child to use scissors to create interesting designs that allow room for error (e.g., cutting slits in folded paper to make “snowflakes,” cutting slits along the margins of a pre-cut feather or leaf shape.)
 - Fold a piece of paper in half and have the child cut along the crease.
 - Have the child cut along straight raised-line paths prepared with puff paint on a sheet of paper. Do the same activity with pre-drawn curved tactile

paths. Eventually have the child cut more challenging shapes (e.g., heart, triangle, oval).

- Glue a cardboard shape to a larger sheet of textured paper or craft foam and then ask the child to cut along the edge of the raised cardboard shape.
- Use scissors in a purposeful context that actively involves the child as a helper. For example, allow the child to cut the ribbon while wrapping a gift or cut an opening in a sealed package. Have the child use blunt-tipped scissors to curl ribbon.
- Allow the child to cut any shape of her choice out of *Quick-Draw Paper* (available from APH). Once cut, dip the created shape into a glass of water and watch it expand into a 3-dimensional form.
- Talk to persons who use scissors daily in their job — seamstress, artist, gift wrapper, hair stylist, barber, etc.

Spoon

- Have the child explore a variety of spoons — different sizes, shapes, and colors (e.g., wooden spoons, baby spoons, ladles, plastic party spoons, decorative handled spoons).
- Have the child sort silverware (spoons, forks) into a tray.
- Can the child locate where spoons are stored in his house?
- Allow the child to name foods that are best eaten with a spoon (e.g., cereal, ice cream, pudding).
- Explore spoon collections that some people keep as souvenirs from places they have visited.
- Allow the child to assist in feeding a baby, setting the table, drying the dishes, mixing batter with a spoon, etc.



- Have spoon relay races: Using a spoon, have teams transfer dried beans, popcorn, or candy from one bowl to another.
- Using measuring spoons, let the child practice measuring dry versus liquid ingredients.

String of Beads

Note: Adult supervision is recommended while conducting the following activities with young children due to the likely encounter with small parts.

- Have the child explore a variety of beaded necklaces and bracelets in different sizes, shapes, and colors.
- Explore places where necklaces and bracelets are stored — jewelry boxes, dresser drawers, etc.
- Explore various types of necklace and bracelet clasps and how the two ends of a necklace or a bracelet lock together.
- Create a variety of necklaces by stringing an assortment of items onto string or yarn. Examples of stringing items include the following:
 - uncooked macaroni, dyed different colors if preferred
 - colorful cereal (e.g., Froot Loops®)



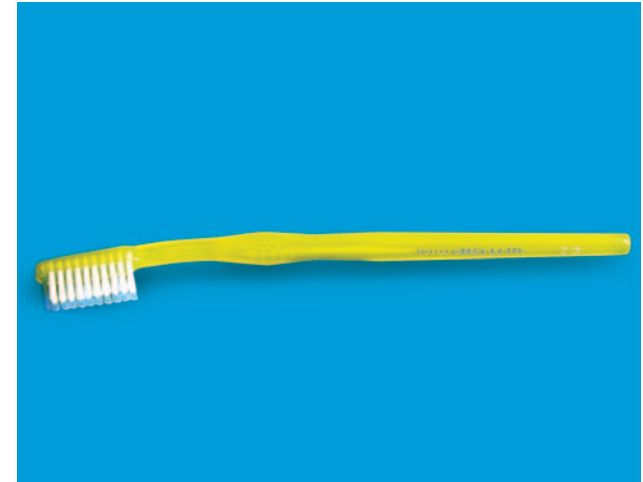
- paper chain loops
 - decorative beads from craft stores
 - pre-cut foam or construction paper shapes with a hole punched in the center. The pre-cut shapes can be separated by short strips of drinking straws.
- Visit antique stores, jewelry stores, consignment shops, etc., where a variety of necklaces are sold. Discuss why some necklaces are more expensive than others.
 - Provide commercially-available lacing beads/shapes of various sizes and materials that the child can string according to a pattern.
 - Measure the length of various necklaces. Sort by length if many necklaces are available.
 - Pair matching necklaces and bracelets. If available, twist or braid different colors of Wikki Stix[®] together to form matching necklaces and bracelets.
 - Read *If Giraffes Wore Necklaces* by Barbara Klyde and Isaac Martinez published by Laredo Publishers, 1998.

- Model the appropriate handling of jewelry due to its fragility and tendency to tangle and form knots.

Toothbrush

Note: It is very important to use the toothbrush included in the kit for tactual exploration only and not for functional use. Provide a personal toothbrush for each child and discourage sharing personal items.

- Have the child explore a variety of toothbrushes — different sizes, shapes, and colors.
- Stress the importance of each person in the family having his own toothbrush. Determine which features of the child's own toothbrush help to discriminate it from the rest of the family's.
- Have the child create a simple "routine book" that shows the morning or nighttime sequence of brushing her teeth. Include such steps as the following: locate the toothbrush, squeeze the toothpaste onto the bristles, replace the cap on the toothpaste tube and put toothpaste away, brush, get a cup of water, rinse, put toothbrush back in holder.

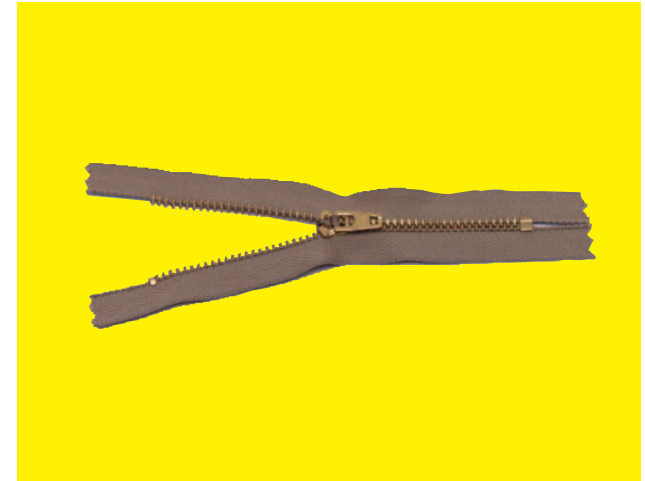


- Have the child practice squeezing toothpaste onto a toothbrush — a pea-size dab is adequate. Provide a travel-size toothpaste tube that is suitable for little hands to squeeze. Remind the child that toothpaste is used for brushing teeth and not for eating.
- Arrange a time with the dentist when the child can examine the tools that the dentist or hygienist uses to clean teeth and compare them to regular toothbrushes.
- Practice basic directional movements/concepts afforded by the simple task of brushing teeth (*circular* motions, *up* and *down*, *behind*, floss *between* teeth, *front* versus *back* teeth, etc.)
- Discuss the importance of regularly brushing one's teeth. Have the child maintain a chart at home to record the number of times he brushes his teeth each day. APH *Feel 'n Peel Smiley Face Stickers* can be used as rewards for brushing his teeth.
- Focus on the feel and shape of various types of toothbrush bristles (soft, flared, stiff, contoured, etc.).

- For more information and games about brushing teeth, visit the following Web site: Colgate® Kids World at <http://kids-world.colgatepalmolive.com>
- Encourage the child to engage in role-playing activities such as pretending to be a dentist or hygienist.
- Actively involve the child in the task of shopping for her new toothbrush. While at the store, examine the various types of dental products (e.g., mouthwash, toothpaste, floss) that are available.

Zipper

- Have the child explore a variety of zippers — different sizes, shapes, and colors.
- Explore zippers on clothing (pants, jackets, shoes, galoshes), furniture/accessories (pillow cases, sofa cushions), and other items (suitcases, cosmetic bags).
- Visit a fabric store to explore various types of zippers and other fasteners.
- Practice the fine motor skills necessary for the child to independently zip her own clothing.
- Compare regular zippers to “zippers” on resealable plastic bags.
- Compare the shape and feel of a zipper not yet sewn into a piece of clothing to one that is already a permanent part of a dress, jacket, etc. Notice that the fabric strips on either side of the metal/plastic zipper are mostly hidden when sewn into a garment or bag.



- Review other types of clothing fasteners (buttons, ties, snaps, buckles, laces, boots, etc.)
- The zipper was a 19th century invention and was first introduced at the Chicago World's Fair in 1893 [Source: <http://inventors.about.com/library/weekly/aa082497.htm>]. If possible, visit a museum or consignment shop that displays vintage clothing and allow the child to become familiar with various fashion styles and fasteners from the past.
- Read *I Wonder Why Zippers Have Teeth and Other Questions about Inventions* by Barbara Taylor, Kingfisher Books, 2003, or *Mrs. Toggle's Zipper* by Robin Pulver and R. W. Alley (Illustrator), Simon and Schuster, 1990.
- Help the child to problem-solve a jammed zipper or bring two halves of a zipper (as on a jacket) together.
- Discuss how we use the word "zip" in our daily language...cars or people *zip around*, we have *zip codes*, there are computer *zip files*, we buy *Ziploc*® bags, etc. What does the word tend to infer [with quickness or speed]?

- Help the child create a “Book of Fasteners” by adhering a zipper to the first page and adding the print/braille word “zipper.” The next pages of the book could feature a button, a shoelace, a buckle, Velcro[®], etc. Limit one item per page with the corresponding print/braille label.
- Model how the teeth on zippers interlock by using the child’s hands as a model. Interlock her knuckles, and then “open” the zipper from the top.
- Using old clothing with a zipper or a zipper not sewn into a piece of clothing, demonstrate what happens when fabric gets caught in the zipper’s teeth.

The background of the slide is a stylized illustration of a stage. It features red curtains with grey outlines and yellow scalloped edges at the top. The curtains are pulled back to reveal a light blue backdrop. The floor is a light yellow color with grey lines radiating from the center. The text is centered on the blue backdrop.

Center Stage:

Thermoformed Objects



CENTER STAGE



Thermoformed Objects

CENTER STAGE activities introduce thermoformed objects that serve as an intermediate tactile format between real objects and less detailed raised-line illustrations. Thermoformed images have the advantage of retaining some of the identifying characteristics of the real object (e.g., the teeth of a comb, the bristles of a toothbrush) that help the child to tactually recognize it in a “hands-on glance.” Yet, tactile thermoformed objects still pose challenges for instant tactile recognition because the function of the real object is lost (e.g., the spoon cannot be used for eating), and its true texture is forfeited (e.g., the cold metal feel of the key is altered). The gradual shift from real to semi-abstract representations using thermoformed pictures still requires tactile interpretation. However, this tactile format increases the chances of successful recognition because the two-dimensional mold so closely resembles the real object and captures one or more salient features.

For each of the 12 real objects included in *Setting the Stage for Tactile Understanding*, a thermoformed counterpart is provided. Once the child acquires

hands-on experience with the real objects included in this kit, the following activities can be used to initiate the gradual transition to two-dimensional tactile pictures.

ACTIVITY 1: Match 'em

Use the provided “Stage,” or tray, that has three individual compartments to create matching activities using combinations of the real objects and the thermoformed cards. Possible matching activities follow.

Note: Black insert cards are provided to achieve visual contrast. Simply insert a black card into the first tray compartment if the real object is not clearly visible against the white background.



Have the child find the thermoformed object that matches the real object displayed.



Example 1



Example 2



Example 3



Example 4

Increase the complexity of these matching activities by rotating the real object in an opposite direction than the thermoformed image.
Examples follow:



Example 1



Example 2

ACTIVITY 2: Compare and Contrast

Have the child verbally describe how the real object and its thermoformed counterpart are the same and different with regard to their texture and function. Examples include the following:

Toothbrush: Bristles are not soft in the thermoformed version, and they are not moveable.

Ball: Thermoformed version does not bounce, and it shows only half of the ball. The rubbery texture has changed as well.

Comb: The comb's teeth in the thermoformed rendition do not move or bend.

Zipper: Pull tab is not moveable, and surrounding fabric is no longer soft.

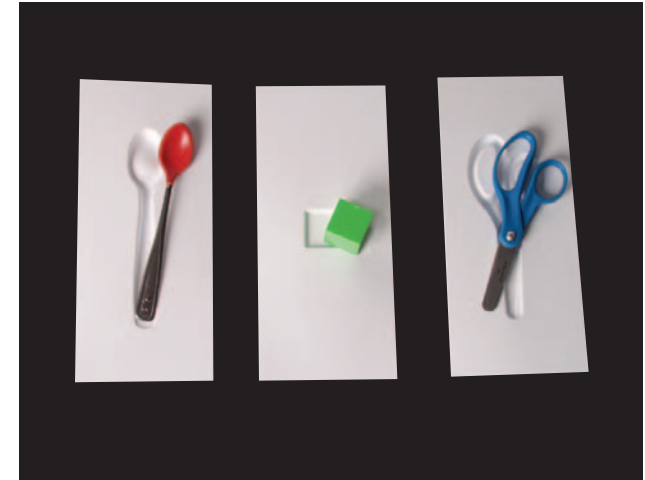
Cup: The opening at the top no longer exists.

ACTIVITY 3: Nest Together

Have the child place each real object into the recessed area of its thermoformed counterpart to confirm that they are of the same shape and size.

ACTIVITY 4: Make an Impression

- Using the provided Crayola Model Magic[®], have the child press one or more of the real objects into the modeling material and create imprints. Note: After the material dries and hardens (about 24 hours), you can add visual contrast by painting the recessed area with acrylic paint (e.g., black paint on white modeling material).
- Allow the child to make different impressions into modeling material using the same object pressed from different angles and positions (e.g., top view versus side view).



ACTIVITY 5: Create a Model

Using the Crayola Model Magic (or playdough, if a permanent model is not desired), allow the child to form a three-dimensional model of one or more of the real objects. Encourage the child to be the creator of the model.

Once the model is complete, explore any scale difference between the real object and the sculpted object that the child created. Is the clay model smaller, larger, or the same size as the real object? Also note and emphasize any texture differences.





Finale:

Raised-Line Illustrations



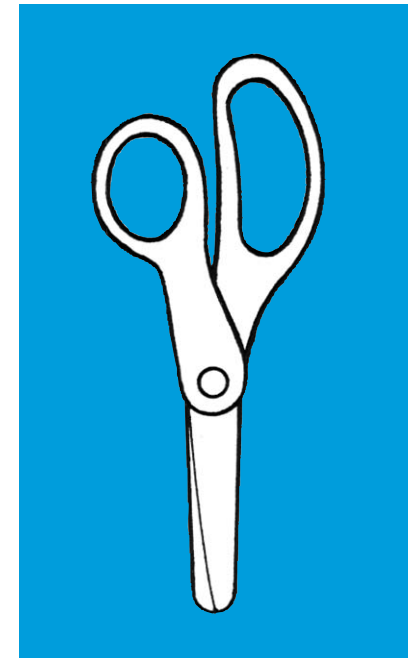
FINALE



Raised-Line Illustrations

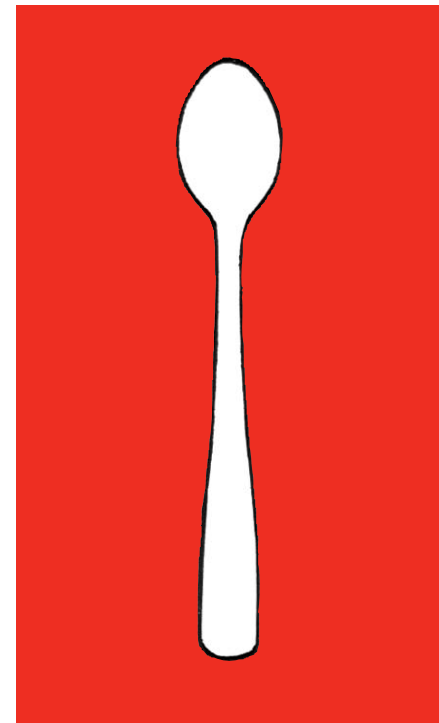
FINALE activities bridge tactile experiences of thermoformed objects with exposure to simple, raised-line illustrations. Raised-line representations introduce tactile complexity on many different levels and therefore require more effort and practice on the child's part to make accurate interpretations.

- Raised-line illustrations usually lose their texture similarities with the real objects because raised lines are presented at a uniform height and in outline format.
- Raised-line illustrations demand that the child connect individual pieces of information to form a complete mental image.



- Raised-line illustrations require systematic searching skills by which a child scans the picture left to right, or top to bottom, always maintaining a reference point or a “return location” so that a picture is not endlessly retraced.
- Raised-line illustrations require the child to follow simple contours or straight-line boundaries or paths.

For each of the 12 objects included in *Setting the Stage for Tactile Understanding*, a raised-line counterpart is provided. Once the child is successful in pairing real objects with thermoformed objects in the CENTER STAGE activities, the following activities can be used to finalize the gradual transition to abstract, two-dimensional tactile pictures. To reduce complexity, one-to-one correspondence in size between the real object and raised-line illustrations is maintained.



ACTIVITY 1: Match 'em

Use the provided “Stage,” or tray, that has three individual compartments to create matching activities using combinations of the real objects and the raised-line drawings. At first, omit the use of the thermoformed cards so that mixed media is not presented. Possible matching activities follow.

Have the child find the raised-line drawing that matches the real object displayed.



Example 1



Example 2

Increase the complexity of these matching activities by rotating the real object in an opposite direction than the raised-line drawing. Examples follow:



Example 1



Example 2

Incorporate all tactile presentations — that is, real objects, thermoformed pictures, and raised-line drawings — into the matching activities that you set up. Have the child identify the cards that display the same object. Examples follow:



Example 1



Example 2



Example 3

As a final assessment, ask the child to insert into the tray the three stages of each object. Examples follow:



Example 1



Example 2

ACTIVITY 2: Compare and Contrast

Have the child verbally describe how the real object and its raised-line counterpart are the same and different with regard to their overall shape. Examples include the following:

Ball: The ball is depicted as a simple circle, and its spherical shape is completely lost.

String of Beads: Simple circles linked by short straight lines represent individual beads.

Puzzle Piece: The puzzle piece consists of short straight and curved lines.

Comb: The comb's teeth are formed by a series of straight lines.

Zipper: The pull tab is no longer higher than the rest of the zipper.

Spoon: The end of the spoon is no longer concave, but is represented by an oval shape at the end of a handle.

Block: The block is now represented by a simple square.

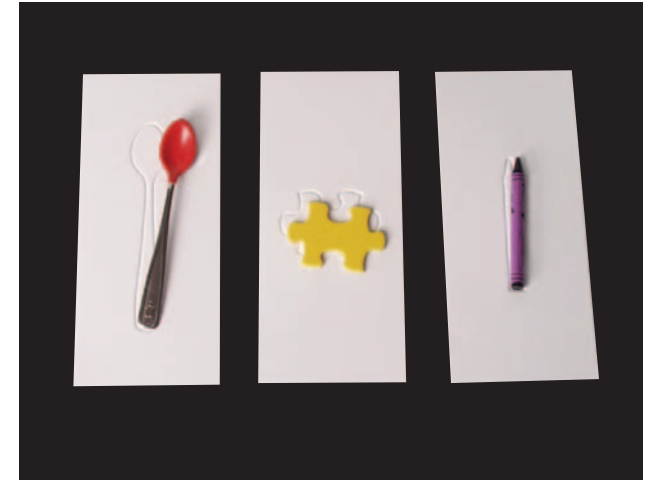
ACTIVITY 3: Nest Together

Have the child place each real object within the outline of its raised-line counterpart to confirm that they are of the same shape and size.

ACTIVITY 4: Trace an Object

Using the provided Wikki Stix[®], have the child outline the outer sides of some of the real objects to form a simple raised-line image. Examples include the following:

- Wrap Wikki Stix around the center of the ball and then remove to see the completed circle. Match this Wikki-Stix circle with the circle on the raised-line card. Are they about the same size?



- Wrap Wikki Stix around the outer edge of the block and then remove to see the completed square. Match the Wikki Stix square to the square on the raised-line card. Are they about the same size?
- Position the puzzle piece on a sheet of paper, then follow the contours of the puzzle piece with Wikki Stix, pressing the Wikki Stix against the paper as the puzzle piece is traced. Is the resulting shape the same as that on the raised-line drawing?

Other tracing activities can be performed by using APH's *Quick-Draw Paper* (if available). Allow the child to trace the real object with a water-based marker onto a sheet of *Quick-Draw Paper*. Provide assistance if needed. Compare the created line-drawing with that provided in *Setting the Stage for Tactile Understanding*.

Black-line masters of each of the real objects are furnished. If available, the teacher can use a Tactile Image Enhancer or Swell-Form machine [see **Resources** on page 105] to create raised-line images onto capsule paper. The tactile outcome on capsule paper is somewhat different in feel to that captured on plastic. Simply place the raised-line drawing on a conventional photocopier and duplicate the image onto a sheet of capsule paper. Then feed the capsule paper through one of the two heating machines aforementioned.

The background of the slide is a stylized illustration of a stage. It features pink curtains with grey outlines and yellow scalloped edges at the top. The curtains are pulled back to reveal a light blue backdrop. At the bottom, there are yellow diagonal lines representing a stage floor or light rays.

Intermission:

Basic Concepts



INTERMISSION



Basic Concepts

INTERMISSION activities can be performed using the real objects and/or thermoformed and raised-line drawings to review and reinforce basic concepts related to shape, size, and position. The sorting tray provides a working platform for these activities. Below are just a few examples:

Find the object that is to the *left* of the scissors.



Find the *circle*.



Place the cup *between* the string of beads and the key.



Find the object that is the *longest*.



Place the string of beads *around* the block.



Which shape has only *straight* sides?



Place the zipper *above* the ball.



Which comb's teeth are facing toward the *right*?



The background of the slide is a stylized illustration of a stage. It features red curtains with grey outlines and yellow ties at the bottom corners. The backdrop is a light blue gradient. The floor is a yellow gradient with radiating lines.

Encore:

Additional Activities

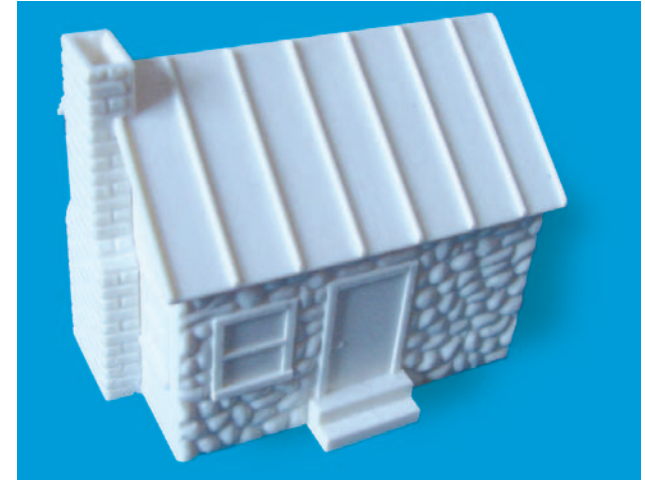


ENCORE



Additional Activities

ENCORE activities transition the child from the exploration of tactile displays that maintain one-to-one correspondence in both shape and size with real objects to a reduced model of an object that is not tactually “at hand.” Like a tree or a mountain, a view of a house can never be tactually absorbed in its entirety as it can be through sight. Isolated experiences of touching the bricks that form the side of a house, climbing two or three steps to the front door, or encountering the wooden frame of a single window, do not permit the entire image of a house to be constructed. Very simply, the whole picture is not within the reach of a young child’s fingertips.



Besides the challenges that size and shape variations pose, understanding perspective is another concept that enters into the equation of interpreting tactile pictures. In the visual world, a variety of two-dimensional images are frequently

encountered that show objects from a number of viewpoints (front view, side view, top or overhead view, cross-section, etc.). These various views do not typically hinder our recognition of the object we perceive visually. We quickly fill in or assume the presence of missing features to form a complete mental image. For example, if we are shown the side view of a bird in a photograph or drawing, we know the same features exist on the other side (another eye, another wing, similar feathers) and within a fraction of a second a three-dimensional shape forms in our minds. If we are shown an aerial view of a city, we recognize green blobs as trees, squares as rooftops of tall buildings, and long parallel lines as highways.



To encourage an early understanding of perspective and how three-dimensional objects are often displayed by two-dimensional drawings, *Setting the Stage for Tactile Understanding* includes a model of a house. This miniature house is unique in respect to the various textures applied to its sides and roof. These differing textures representing real-life equivalents (e.g., stone, brick, stucco, tin roof, etc.),

paired with identifiable features (brick chimney, door, window, steps), will assist the child in locating the correct views of the house when presented in a two-dimensional format. Twenty tactile cards accompany the three-dimensional model of the house. Five of these cards show correct views of the house, and the remaining fifteen cards display incorrect views.

The activities outlined on the next few pages are intended to assist the child in understanding how real objects can be represented in reduced scale, as well as from various viewpoints within a two-dimensional drawing. Keep in mind that these ENCORE activities and those encountered in the previous chapters play just a small role in setting the stage for tactile understanding. Continue to expose the young child to a variety of tactile experiences at home and in the classroom. Tactile understanding is achieved through repeated hands-on practice.

Encore Activities

My House

Before using the model of the house and related tactile cards, discuss the physical characteristics of the child's own house. Which features of his own house does he know and experience? Examples of questions to ask include the following:

- Are the outer sides of your house made from brick, siding, stucco, etc.?
- Do all sides of your house have windows?
- Is there a porch?
- Is there a garage? If so, is it attached to the house or separate?
- Are there entrance steps?
- Are there gables or bay windows?
- Is there a chimney?
- How does your house compare to others in the neighborhood or others that you have visited?

Create a House Drawing

Encourage the child to create a drawing of her house. The definition of a “drawing” can extend beyond one created with paper and crayons. Provide some of the following tools to allow the child to create or construct a representation:

- Playdough or modeling clay
- Collage image using string, yarn, foam shapes, etc., glued onto a piece of paper or cardboard
- *Picture Maker: Wheatley Tactile Diagramming Kit* that includes interchangeable Velcro shapes and strips [available from APH]
- *Tactile Marking Mat* [available from APH]
- *Quick-Draw Paper* [available from APH]

Of course, there’s no right or wrong way for the child to draw or design her house.

Miniature House

Tactually explore the differences between the house model and a real house. Note the obvious differences in size of various features. Emphasize scale differences by examining a real window and the model's window, a real door and the model's door, a single brick on the chimney and an actual brick found on a building, etc. Actually walk the distance from one side of a house to the other; then measure with a ruler the length of one side of the house model.

Continue to explore a variety of miniature models of familiar objects in the child's world. Many toys incorporate reduced representations of animals, people, vehicles, furniture, and so forth. A dollhouse, although larger than the included model, will demonstrate the same concept of size reduction.

Pretend Play

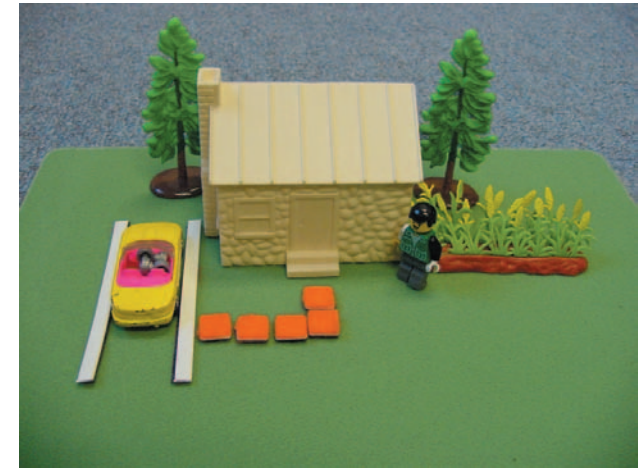
Use the model of the house in combination with other miniature models (store bought or self-created). Using the back of the included sorting tray, encourage the child to add tactile scenery around the house model and construct make-believe situations.

Position the house on the green Velcro surface and provide manipulatives or models that the child can use to construct an interesting scene. The following are some examples of additional models that can be provided or built:

- Sandpaper strips can be used as sidewalks or driveways
- Small plastic trees (like those bought with holiday models) can be placed around the house or “yard”
- Colorful plastic rhinestones can be used for stone walkways
- Cut a piece of thin cardboard into the shape of a pond or backyard swimming pool and cover it with aluminum foil
- Provide toy cars and people to move around the created scene
- Build a small version of a swing set with pipe cleaners
- A small cardboard box can be turned on its side to represent a garage
- Lego® blocks

Attaching hook Velcro to the bottom of constructed items will add stability when placed on the tray’s surface.

Let the child's imagination be the guide during the construction of the miniature scene. Relative size inconsistencies should be permitted when adding the tactile embellishments, but don't forget to compare the size of the various models to each other in the final creation. For example: Is the car longer than the side of the house? Are the models of the people taller than the front door? In short, take advantage of scale differences noticed in the final scene as a teaching tool or problem-solving task. This pretend activity can help reinforce how small models, realistic or abstract, can be useful for representing real things in our surroundings and for demonstrating the spatial relationship of those things to each other.



What is a View?

Front view, side view, top view, bird's eye view, and cross-section are all visual terms that don't translate into tactile understanding without intentional teaching. Below are some hands-on ways to demonstrate these various terms before actually presenting the two-dimensional displays of the house model.

Front View:

- Use a person's face to demonstrate *front view*. If we explore a person's face from its front view, we can see and feel both eyes, both ears, the entire forehead, the full mouth and nose. A profile of a face is not as complete.

Side View:

- Use the provided toothbrush and its tactile representations (thermoformed or raised-line depictions) as examples of *side view*. First have the child trace his finger along the edge of the handle and along one side of the bristles. This is the view captured in the supplied tactile representations.

Top View/Overhead View:

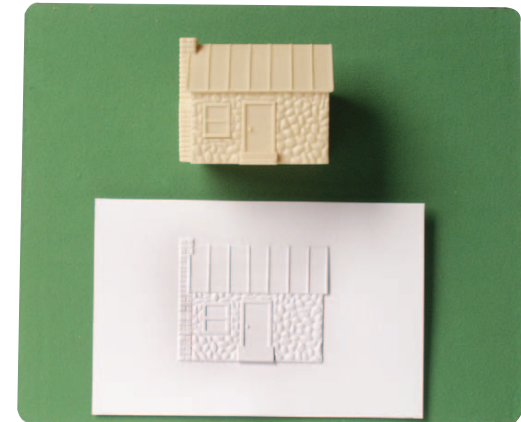
- Using the provided plastic cup, illustrate that a *top view* of this object is merely a circle. Have the child trace the upper ridge of the cup. If a top view of the cup were shown in a tactile picture, it would look very similar, but larger than that shown in the raised-line drawing of the ball.

Cross-sectional View:

- Compare a whole fruit (peach, apple, orange) to one cut in half. Explain how a *cross-sectional view* allows you to examine the features in the middle that are usually hidden.
- Many dollhouses give only a cross-sectional view of interior rooms.

Correct House Views

Begin by using only the tactile cards that show correct views of the house model. Have the child explore the five cards individually and then locate the side view or top view of the house that matches each tactile picture. To add stability for tactile exploration, attach a couple of Velcro dots [provided] to the back of each card so that it can be securely positioned on the underside of the sorting tray. After the correct view of the house is matched with the model itself, have the child place the house on the tray, above the positioned tactile card, so that it faces toward them as if they were visually looking at it.



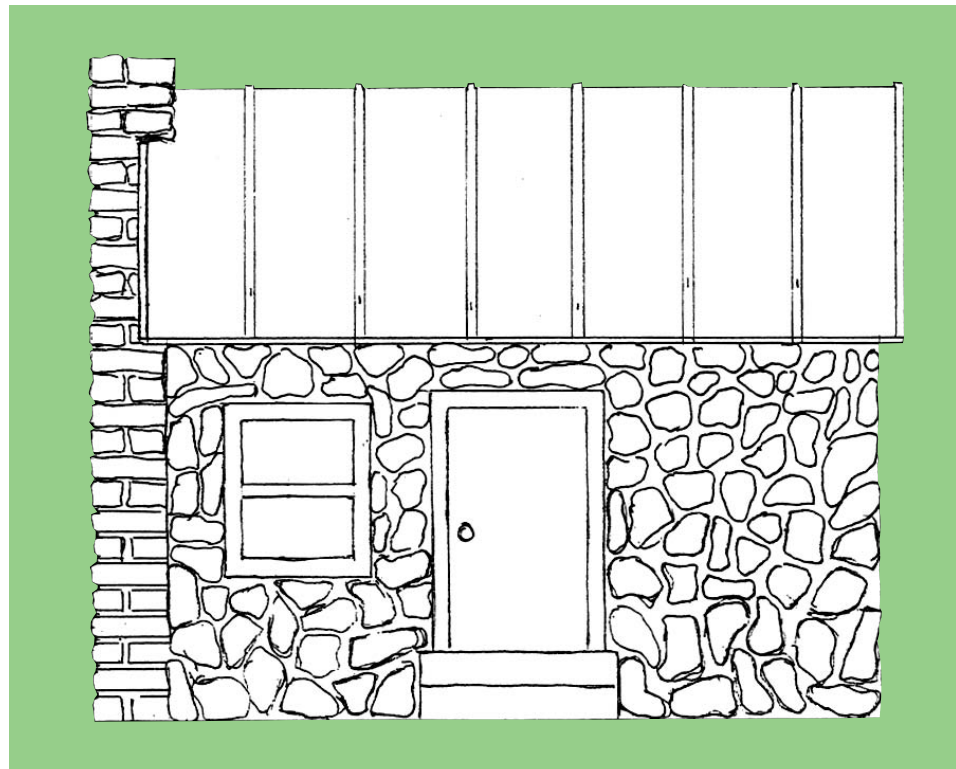
Incorrect House Views

After the child can successfully match the correct views with the house, introduce the 15 cards with incorrect views. Systematically review each card indicating to the child the feature(s) that differs in the tactile display from the actual house model. It might be a texture difference (e.g., rough instead of smooth), an added feature (a window), or a positional change (chimney on the wrong side). Only one feature deviation from the house model is present on the majority of the cards to minimize complexity. However, a few cards are added that include more than one tactile difference from the house model. These cards can be incorporated for more challenging activities. Each correct view and incorrect view of the house model is shown and described at the end of this chapter for your reference.

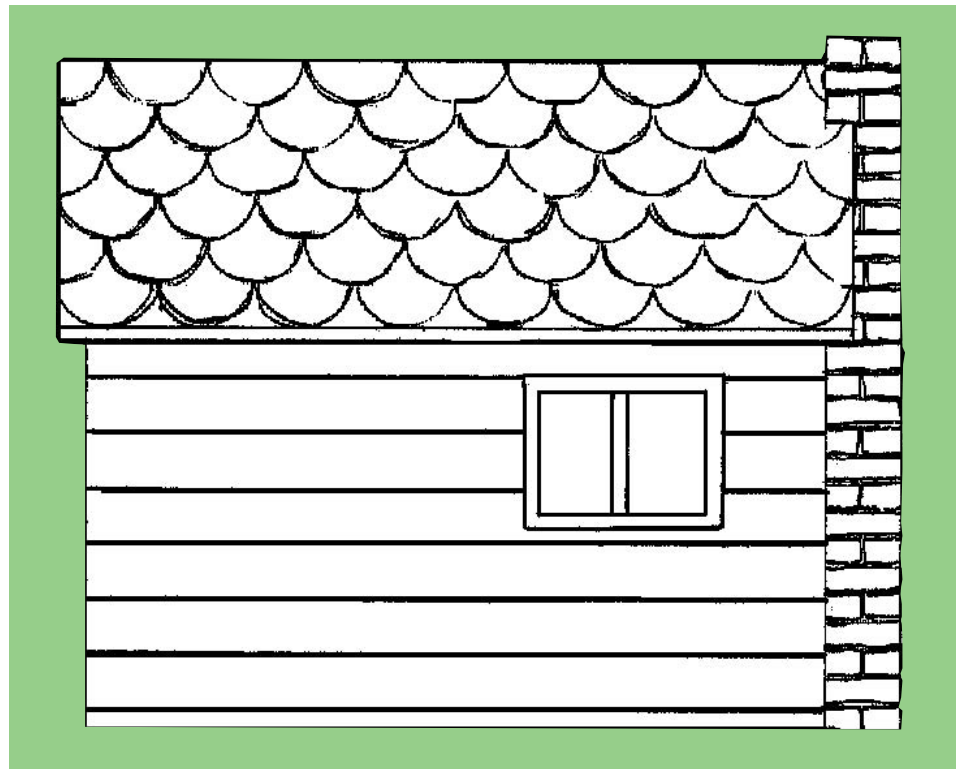
Grab Bag

For a final assessment of the child's ability to recognize the house views as either correct or incorrect, shuffle all the tactile cards together and allow the child to carefully sort the cards into two separate stacks that identify each. Label two shoeboxes or trays — one "Correct Views" and the other "Incorrect Views" — and sort the cards accordingly.

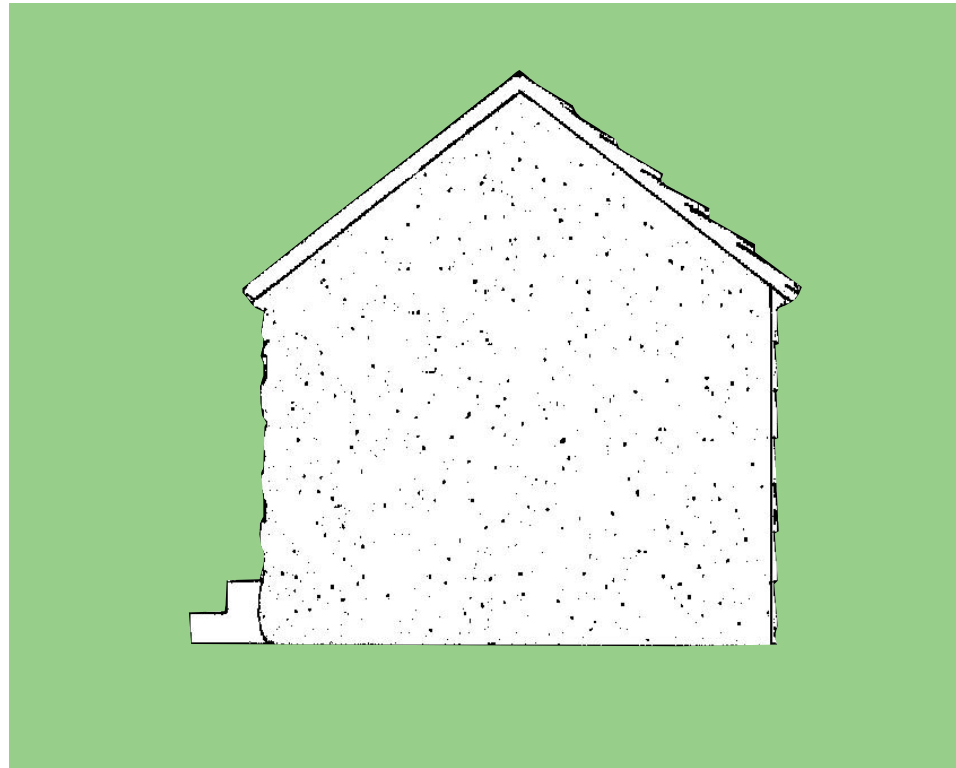
HOUSE VIEW 1: Correct view of front of house



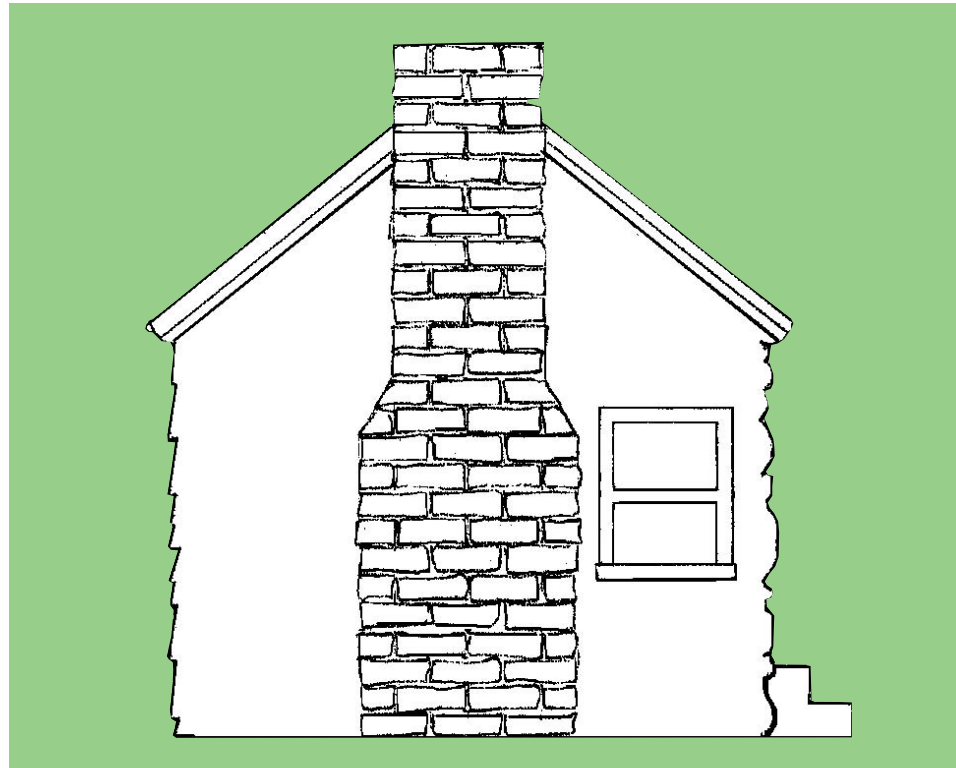
HOUSE VIEW 2: Correct view of back of house



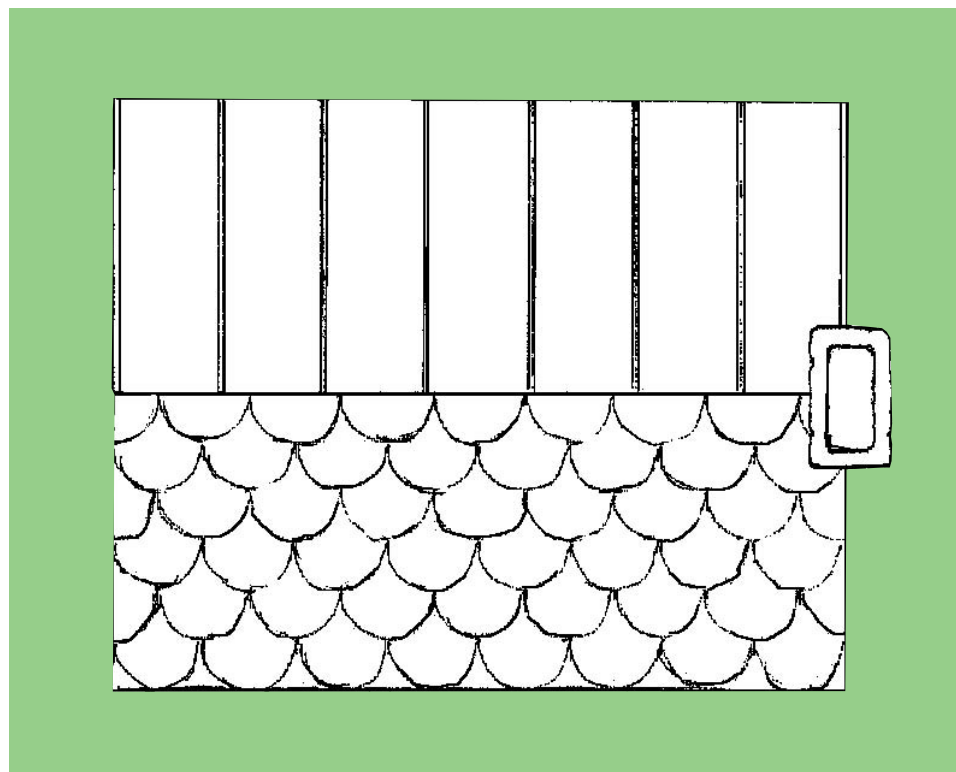
HOUSE VIEW 3: Correct view of side of house



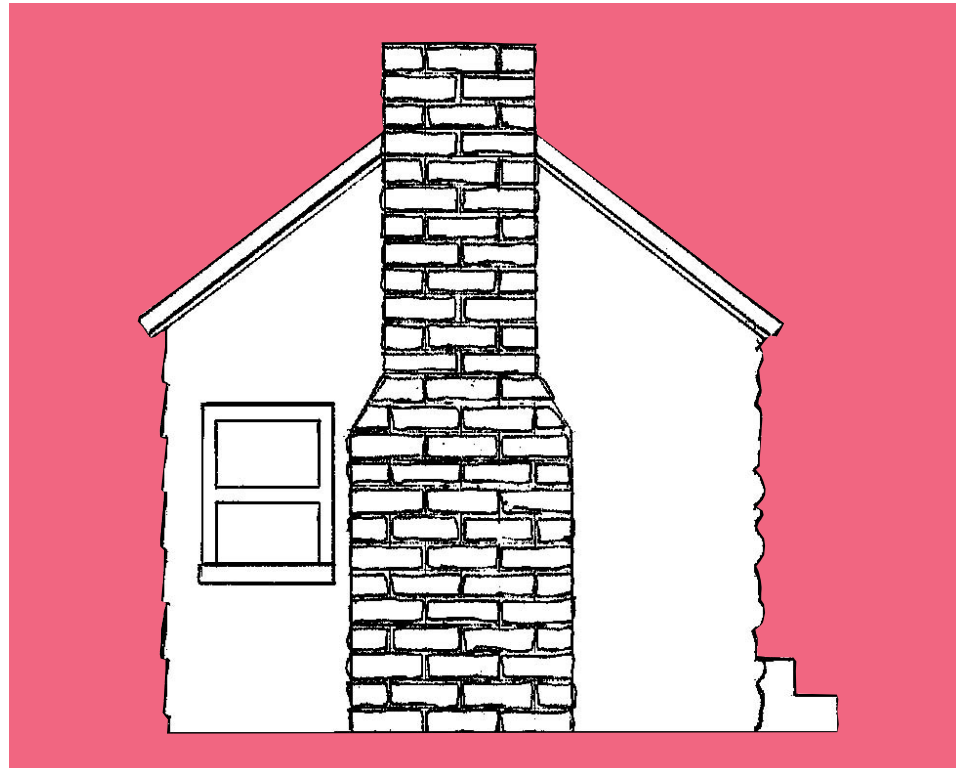
HOUSE VIEW 4: Correct view of chimney side of house



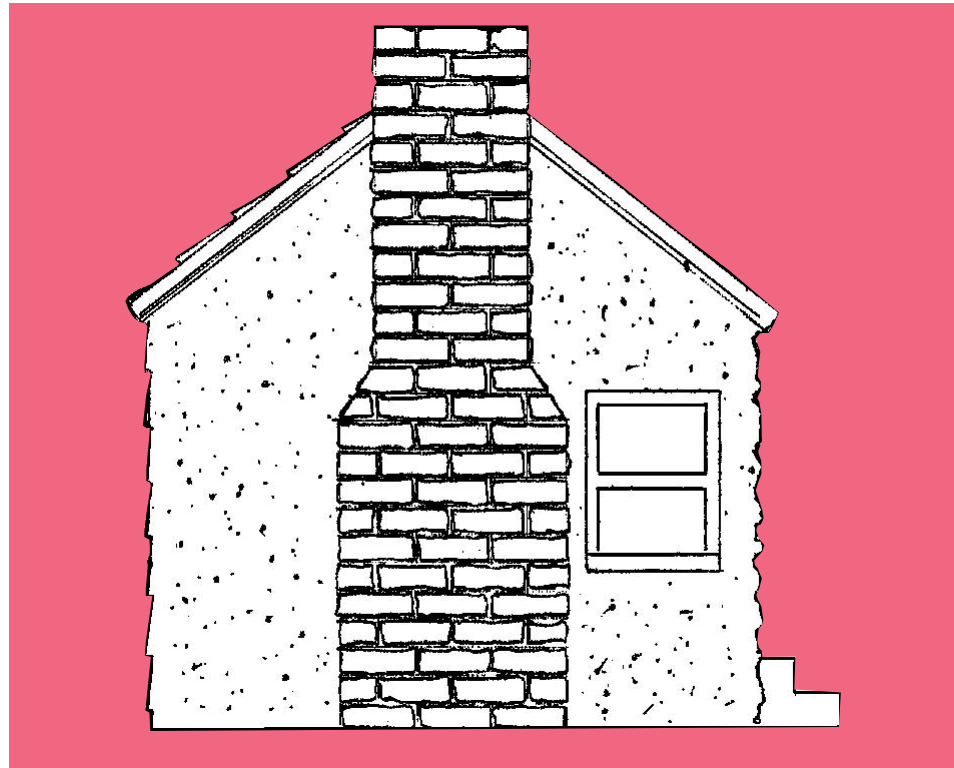
HOUSE VIEW 5: Correct view of roof



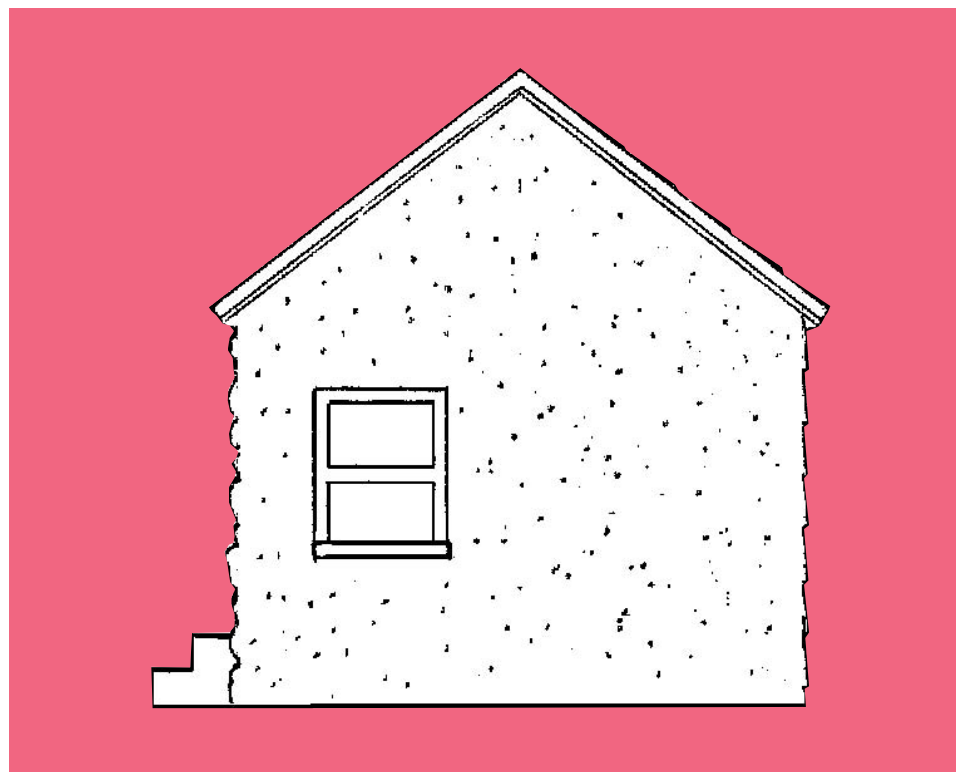
HOUSE VIEW 6: Incorrect view of chimney side of house
The window is on the wrong side of the chimney.



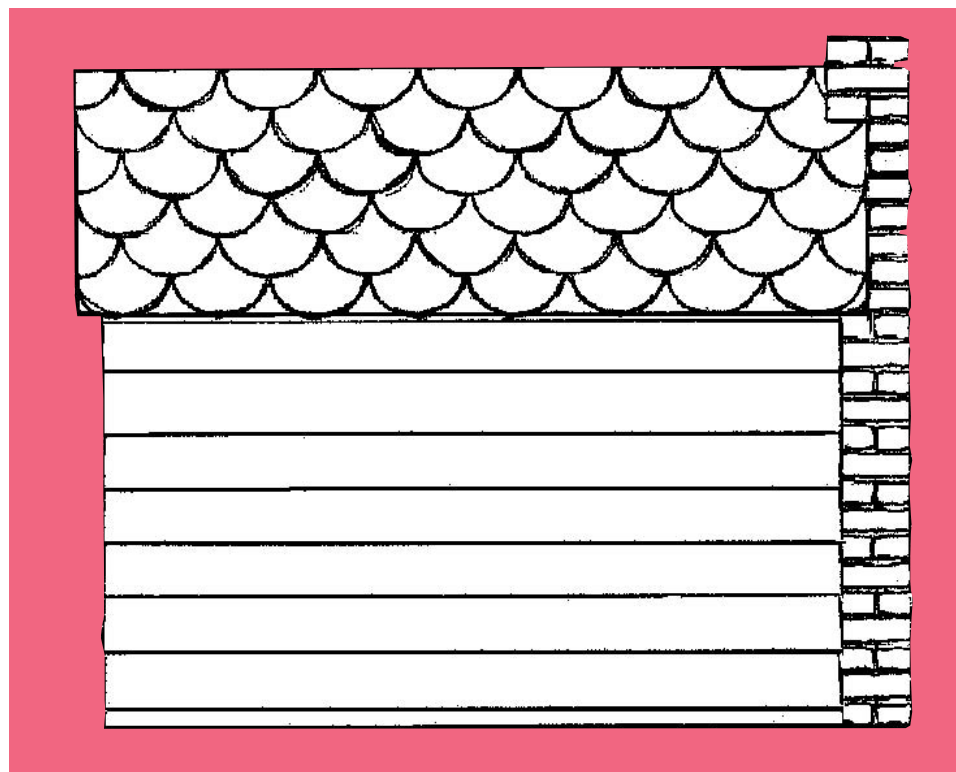
HOUSE VIEW 7: Incorrect view of chimney side of house
The wrong texture is applied to the side of the house.



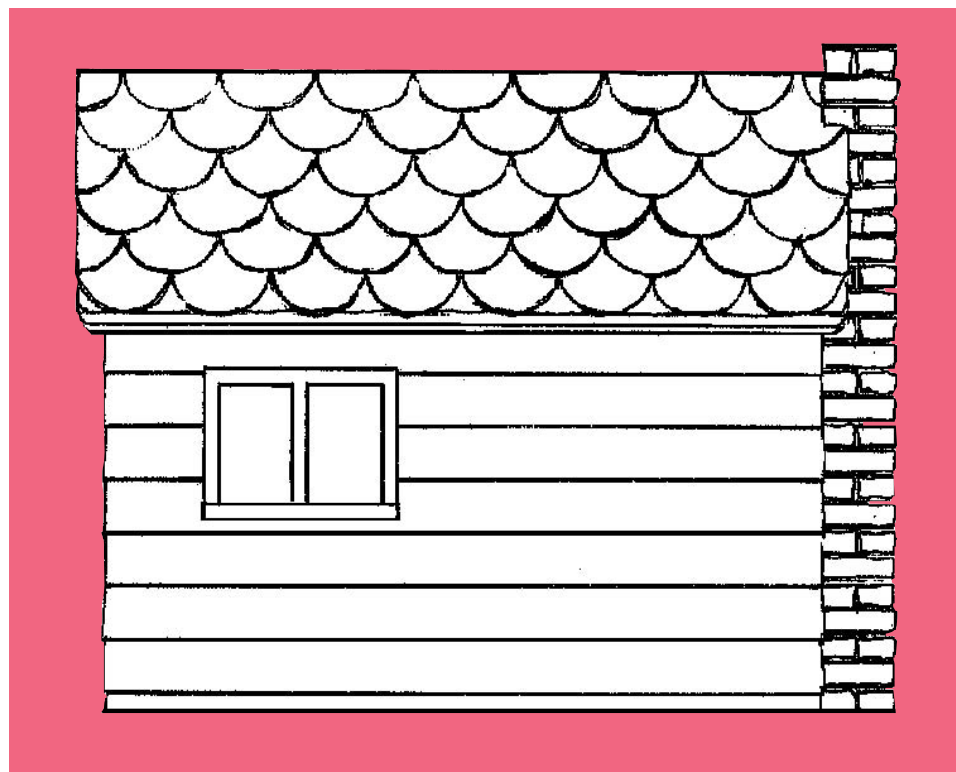
HOUSE VIEW 8: Incorrect view of side of house
A window is added.



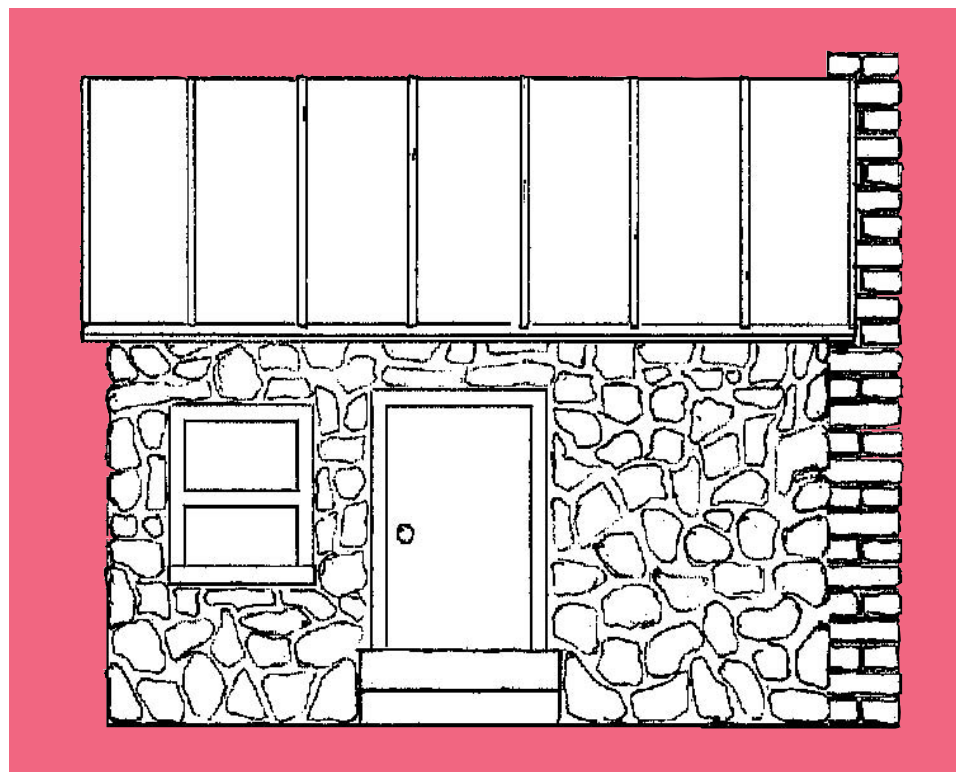
HOUSE VIEW 9: Incorrect view of back of house
A window is missing.



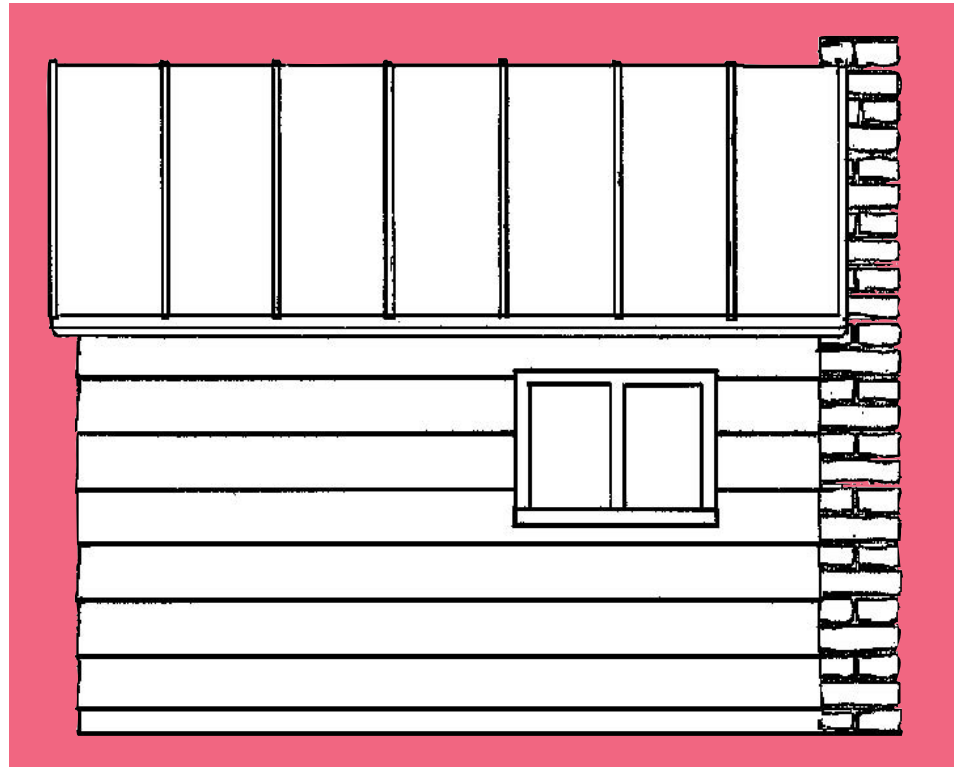
HOUSE VIEW 10: Incorrect view of back of house
Window is on the wrong side.



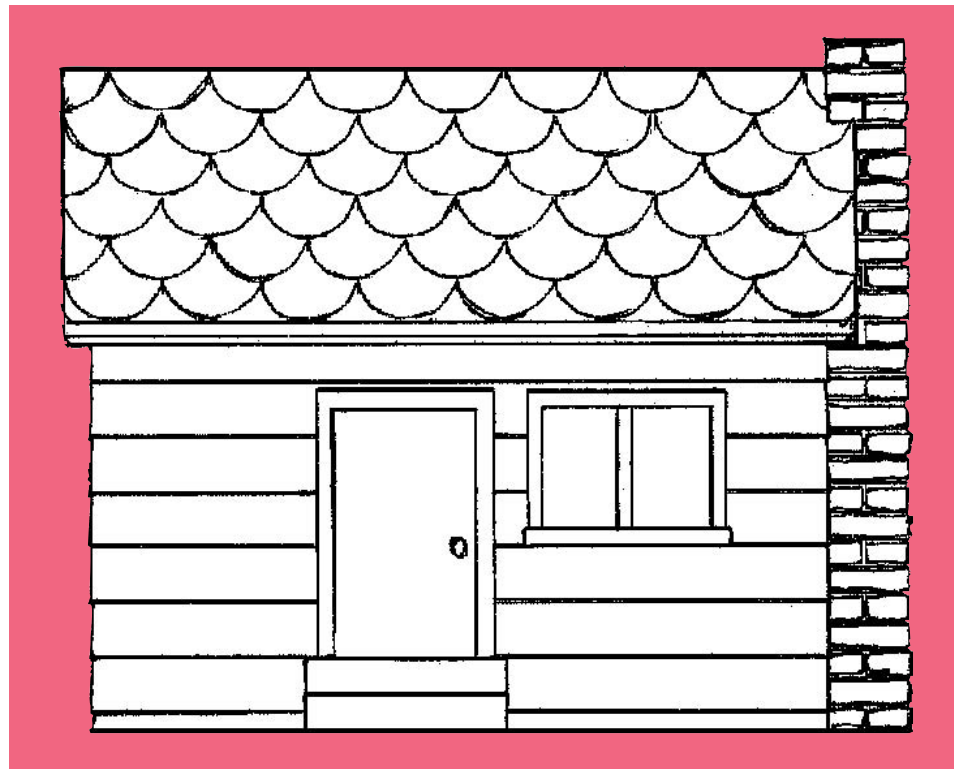
HOUSE VIEW 11: Incorrect view of front of house
The chimney is on the wrong side.



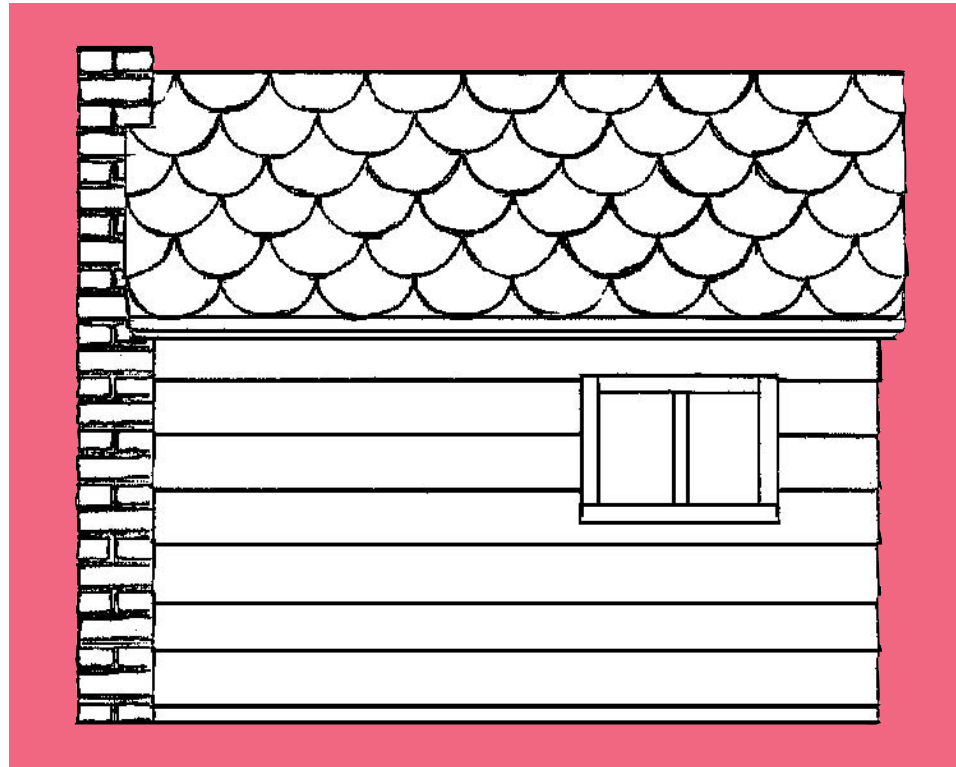
HOUSE VIEW 12: Incorrect view of back of house
The roof is the wrong texture.



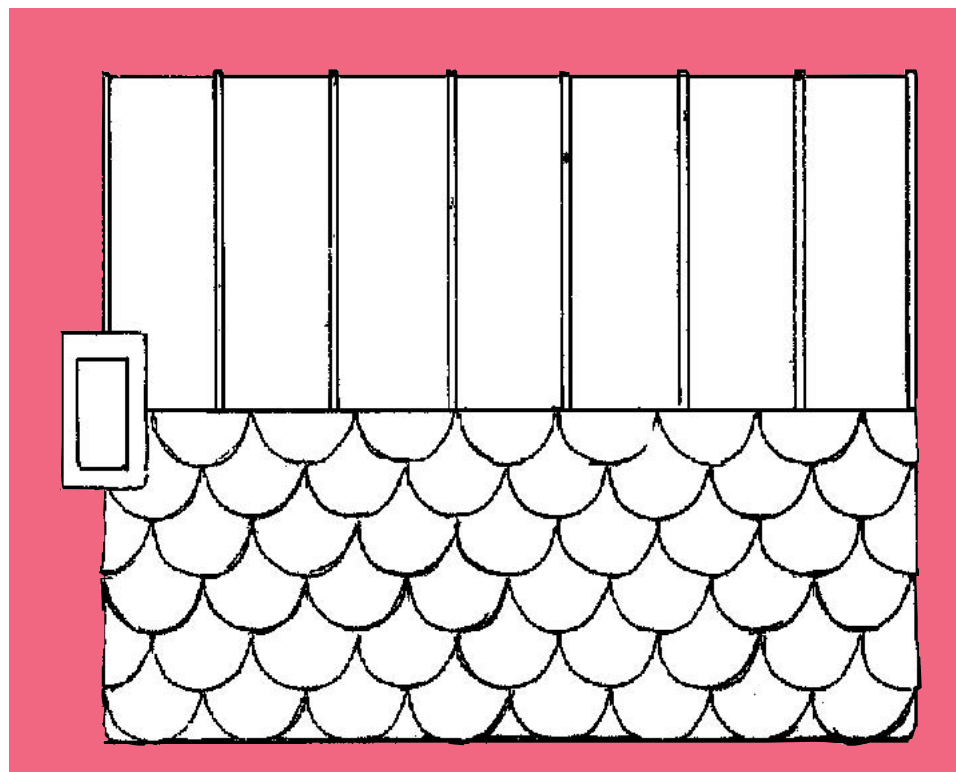
HOUSE VIEW 13: Incorrect view of back of house
Door with steps is added.



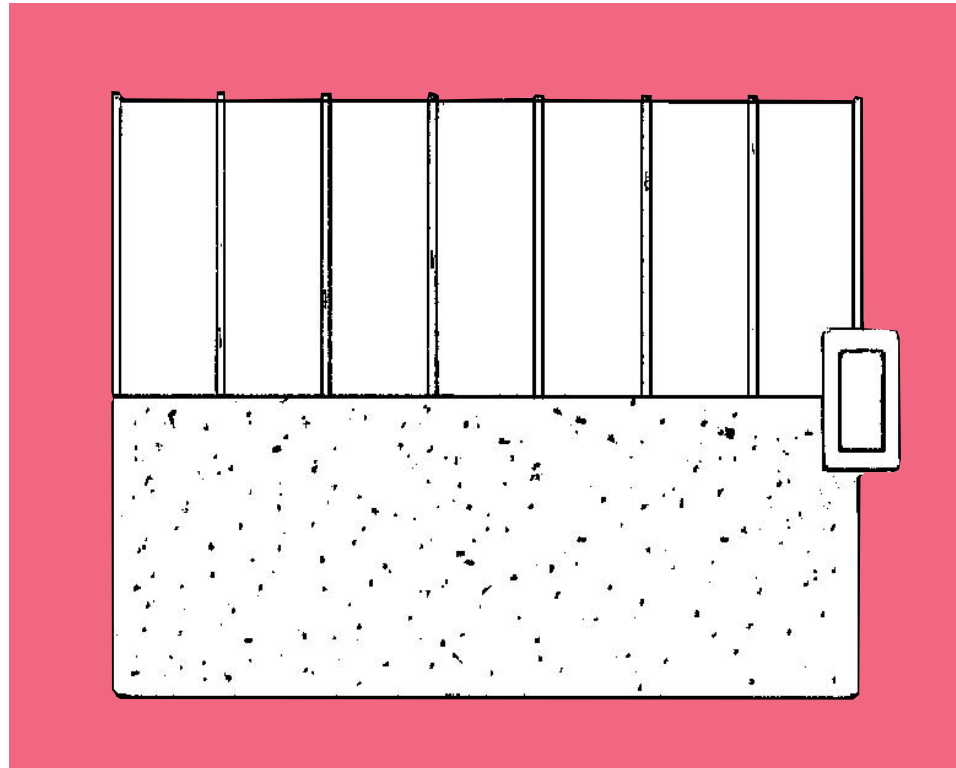
HOUSE VIEW 14: Incorrect view of back of house
Chimney is on the wrong side.



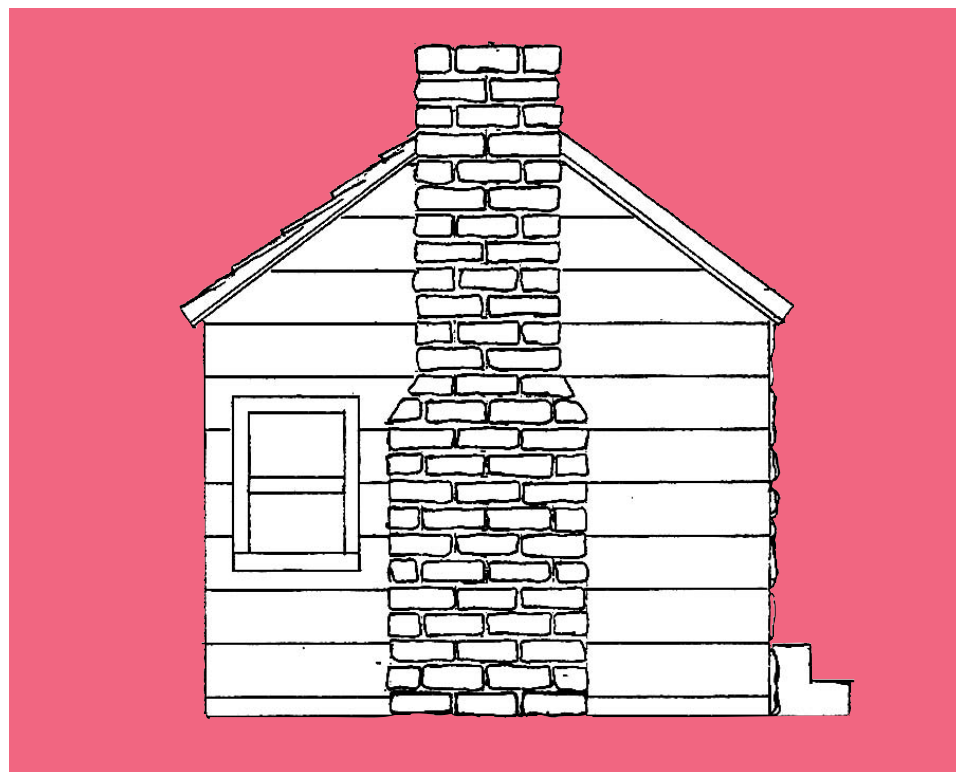
HOUSE VIEW 15: Incorrect view of the top of roof
Chimney is on the wrong side.



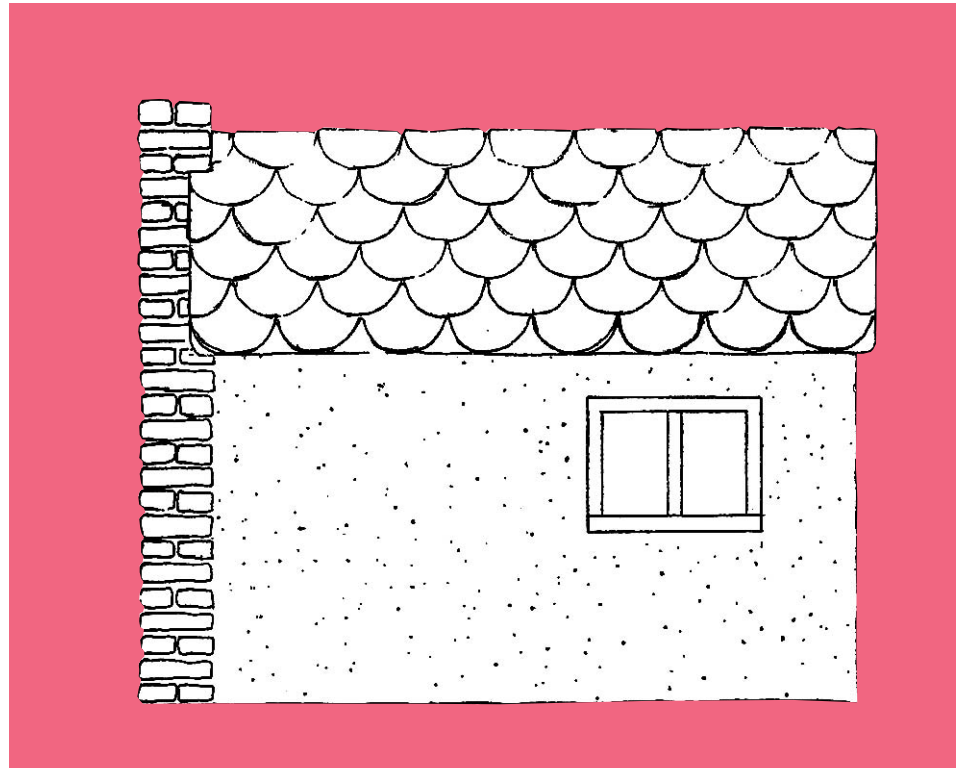
HOUSE VIEW 16: Incorrect view of the top of roof
Rough texture instead of overlapping shingles is applied to one half of the roof.



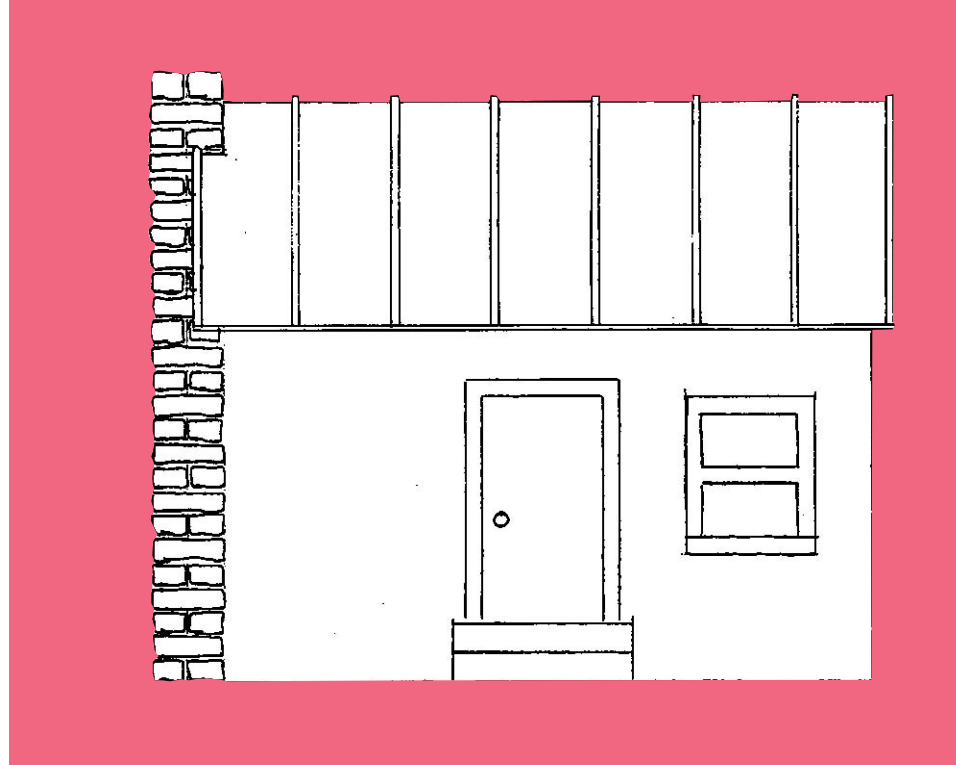
HOUSE VIEW 17: Incorrect view of chimney side of house
Window is on wrong side, and siding texture is added.



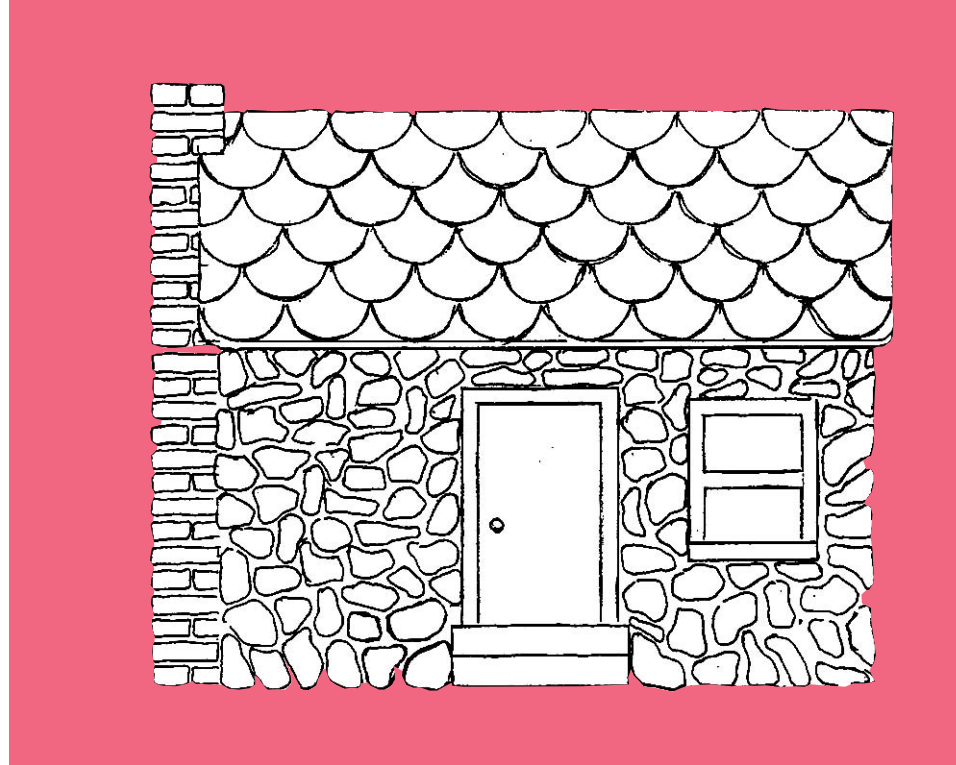
HOUSE VIEW 18: Incorrect view of back of house
Chimney is on wrong side, and stucco instead of siding texture is added.



HOUSE VIEW 19: Incorrect view of front of house
Smooth texture replaces stone, and window is on the right.



HOUSE VIEW 20: Incorrect view of front of house
Window is on the right, and roof texture is changed.



HOUSE GAME

The following game using the house model and related tactile cards was created by students in Virginia:

Divide players into two teams of no more than two players. Sighted players should wear blindfolds. Each team/player is given 30 seconds to determine if a house view is a “correct view” or “incorrect view.” The house model should always be provided during observation. The team that correctly identifies the most number of cards within the time limitation wins.

The background of the slide is a stylized illustration of a stage. It features red curtains with grey outlines and yellow scalloped edges at the top. The curtains are pulled back to reveal a light blue backdrop. At the bottom, there are yellow diagonal lines representing stage lights or a floor.

Curtain Call:

Resources and Bibliography



CURTAIN CALL



Resources and Bibliography

Resources

APH Products

The following products available from the American Printing House for the Blind can be used in combination with *Setting the Stage for Tactile Understanding* or as additional tactile training tools:

- Chang Tactual Diagram Kit (Catalog #: 1-03130-00)
- Crafty Graphics (Catalog #: 1-08844-00)
- Feel 'n Peel Stickers: Point Symbols (Catalog #: 1-08846-00)
- IntelliTactiles: Pre-Braille Concepts (Catalog #: 1-08516-00)
- Large Textured Block (Catalog #: 1-03820-00)
- Lots of Dots: Learning My ABC's (Catalog #: 1-10000-00)

- On the Way to Literacy storybooks
- Picture Maker: Wheatley Tactile Diagramming Kit (Catalog #: 1-08838-00)
- Puzzle Form Board Kit (Catalog #: 1-03721-00)
- Quick-Draw Paper (Catalog #: 1-04960-00)
- Rolling Into Place (Catalog #: 1-08450-00)
- Tactile Graphics Kit (Catalog #: 1-08851-00)
- Tactile Marking Mat (Catalog #: 1-03331-00)
- Tactile Treasures (Catalog #: 1-08842-00)
- Tactual Discrimination Worksheets (Catalog #: 1-08810-00)
- Teaching Touch (Catalog #: 1-08861-00)
- Textured Matching Blocks (Catalog #: 1-08950-00)
- Textured Paper Collection (Catalog #: 1-03275-00)

- Touch and Tell (Catalog #: 6-44670-00)
- Web Chase (Catalog #: 1-08460-00)

Other Sources and Products

American Thermoform Corporation

1758 Brackett Street

La Verne, CA 91750

Phone: (909) 593-6711

Toll Free: (800) 331-3676

Fax: (909) 593-8001

Email: sales@atcbrleqp.com

Web site: www.atcbrleqp.com

American Thermoform Corporation sells Brailon, Swell-Form machine, Swell-Touch paper.

Beyond Play

Early Intervention Products

1442-A Walnut Street #52

Berkley, CA 94709

Phone: 1-877-428-1244

Fax: 1-877-218-8441

Email: custserv@beyondplay.com

Web site: www.beyondplay.com

Beyond Play offers early intervention products for children birth to five. Examples are textured blocks, sorting boards, and a variety of texture and sound balls.

Creative Adaptations for Learning (CAL)

38 Beverly Road

Great Neck, NY, 11021-1330

Phone: (516) 466-9143

Email: calinfo@cal-s.org

Web site: www.cal-s.org

CAL sells tactile shapes and rhyme books and raised shapes counting cards.

Crayola

Crayola® Model Magic Modeling Material

Toll Free: 1-800-CRAYOLA

Web site: www.Crayola.com

Model Magic can be purchased at many local drug stores, craft stores, and toy stores.

Exceptional Teaching Aids, Inc.

20102 Woodbine Avenue

Castro Valley, CA 94546-4232

Toll Free: 1-800-549-6999

Fax: 510-582-5911

Email: ExTeaching@aol.com

Web site: www.exceptionalteaching.com

Exceptional Teaching Aids, Inc. sells a variety of tactile materials for visually impaired and blind children including shape puzzles, shape sorting boards, and lacing beads.

MindWare

121 5th Avenue NW

Brighton, MN 55112

Toll Free: 1-800-999-0398

Fax: 888-299-9273

Web site: www.MINDWAREonline.com

MindWare sells a variety of games and puzzles that would require minimal or no tactile adaptation.

Omnikor, Inc.

2432 W. Peoria, #1188

Phoenix, AZ 85029

Phone: (602) 870-9937

Toll Free: 1-800-TO WIKKI

Fax: (602) 870-9877

Omnikor, Inc. sells a variety of WikkiStix[®] packages. WikkiStix products can also be purchased at local craft stores.

Repro-Tronics, Inc.

75 Carver Avenue

Westwood, NJ 07675

Phone: (201) 722-1881

Fax: (201) 722-1881

Toll Free: 1-800-948-8453

Email: info@repro-tronics.com

Web site: www.repro-tronics.com

Repro-Tronics, Inc. sells the Tactile Image Enhancer and Flexi-Paper.

Bibliography

- Griffin, H., & Gerber, P.** (1981). Tactual development and its implications for the education of blind children. *Education of the Visually Handicapped*, 12, 116-123.
- Heller, M. A., & Schiff, W.** (1991). *The psychology of touch*. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.
- Heller, M. A., Kennedy, J. M., & Joyner, T. D.** (1995). Production and interpretation of pictures of houses by blind people. *Perception*, 24, 1049-1058.
- Lederman, S. J., Klatzky, R. L., Chataway, C., & Summers, C. D.** (1990). Visual mediation and the haptic recognition of two-dimensional pictures of common objects. *Perception & Psychophysics*, 47(1), 54-64.
- Pathak, K., & Pring, L.** (1989). Tactual picture recognition in congenitally blind and sighted children. *Applied Cognitive Psychology*, 3, 337-350.

- Shimizu, Y., Saida, S., & Shimura, H.** (1993). Tactile pattern recognition by graphic display: Importance of 3-D information for haptic perception of familiar objects. *Perception & Psychophysics*, 53(1), 43-48.
- Lewis, S., & Tolla, J.** (2003). Creating and using tactile experience books for young children with visual impairments. *TEACHING Exceptional Children*, 35(3), 22-28.



American Printing House for the Blind, Inc.
1839 Frankfort Avenue
P.O. Box 6085
Louisville, Kentucky 40206

Kit Catalog # : 1-08853-00
Large Type Guidebook Catalog # : 7-08853-00

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