

Lesson 4.14: Build the Model

Unit: Unit 4, Spaces We Live In (Environmental Design and Management) **Topic:** 4.3 Design a Room project **Grade:** 6 to 8 (written at grade 7; see Differentiation for the grade 6 support and grade 8 stretch) **Days:** 3 class periods of 40 minutes (days 110, 111, 112) **Room:** FACS lab or classroom with flat tables, a cutting station, and a drying shelf

Standards

- NYS module line: NYS EDM 2. Environment and Interior Design a) Design shared environments and living space zones (for home, school, work, and/or community) which show respect for individual privacy needs and appreciation of large group social needs; b) Create a floor plan designed to meet the needs of individuals, families, or communities; c) Incorporate the elements and principles of design into a design plan; d) Research how environmental and green home factors influence the design of functional, safe and aesthetic living spaces
- CTE theme line: CTE PSI 2. Design Process (Proactive) a) f. Developing and constructing a prototype or model of the selected design
- CTE theme line: CTE SUS 2. Environmental Management f) Explain factors to consider when assessing the environmental impact of housing decisions
- NYS FACS Learning Standard 2 (Intermediate), Key Idea: Students will know the basic principles of home and community safety. They can demonstrate the skills necessary to maintain their homes and workplaces in a safe and comfortable condition. They can provide a safe and nurturing environment for themselves and others.; Performance Indicator: Students know the basics of managing a safe and healthy home.
- CDOS Standard 3a Universal Foundation Skills: Technology
- National FCS 3.0: 11.4.4 Place furniture with design principles, traffic flow, activity, and the room's architecture in mind.
- National FCS 3.0: 11.9.1 Show the knowledge and skill to recycle and redesign.

Four EDM 2 lines are listed because the model is where all four come together; the assessment table says which objective carries which.

Enduring understanding and essential question

Big idea: A model is the plan you can walk around. It shows the client what the paper cannot: the height of a wall, the color on it, and whether the room feels like theirs.

Essential question: What does a model tell the client that a floor plan does not?

Objectives

By the end of this lesson, students will be able to:

1. (Low) Given the plan, build the room's walls and floor in a shoebox or on foam board at a stated scale, with the door, windows, and closet in the same places as the plan.

2. (Mid) Furnish the model from the plan, apply the color scheme chosen in Lesson 4.8, and label one green choice (from Lesson 4.5) and one safety feature (from Lesson 4.2) on the model with a card that says why.
3. (High) Write a two-sentence justification that connects the model's biggest design choice to the client's need and to one principle of design.

Vocabulary

Tier 2 (general academic): model, prototype, scale (again), label, justify Tier 3 (FACS): elevation, isometric, color scheme (monochromatic, complementary, analogous, from Lesson 4.8), focal point, green choice, universal design. See Vocabulary 04.md for Turkish, Portuguese, and Spanish.

Materials and setup

- One shoebox per student or team, lid removed (collected free from students, families, and a shoe store the month before) [*Sal: send the note home in Lesson 4.6 so boxes arrive by day 110*], or foam board 20 by 30 inches, one sheet cut to make two or three model bases
- Foam board or corrugated cardboard for walls that are not the box's own walls (tiny house: the box is the trailer; the loft is a shelf of card)
- Card stock (white and colored), scrap fabric, felt scraps, sample paint chips, construction paper, magazine pages for floor and wall finishes
- Glue sticks, white glue, low-temperature glue guns at one supervised station, masking tape
- Scissors; craft knives only at the teacher's cutting station, teacher use or supervised grade 8 use only [*Sal: your room's rule*]
- Rulers, pencils, markers
- Handout 04.14 - Model Build Guide and Label Cards.md: the build guide (one per team), the two label cards and the justification card (one set per team), and the isometric grid page for the no-materials alternative
- The plan, the Budget Sheet, and the client card in the project folder
- Slides: Slides 04.14 - Build the Model (Day 1, Day 2, Day 3 marked)
- A drying shelf or a corner of the counter labeled by period
- Setup notes: pre-cut a few foam board bases for students who bring no box. Set up the glue gun station away from the traffic path with a heat-safe mat. Run the sanitation routine in reverse for a craft day: sleeves up, hair back, station check before dismissal. Allergy check: some students react to hot glue fumes or latex in foam; ask.

Pre-assessment

The Budget Sheet exit cards from Lesson 4.13 (anyone over budget fixes it in the first five minutes of Day 1). The Lesson 4.8 color cards in the folder tell you whether every team already has a scheme; a team without one picks from the three on the build guide.

Do now and hook (Time: 5 min each day)

Day 1 do now (floor plan stack, day 9): “Draw your client’s room as a box with the walls folded down flat (a net): the floor in the middle, four walls around it. Label which wall has the door and which has the window.” Two minutes, one to compare. Hook: hold up a shoebox and a finished plan from a previous class (no name). “This is the same room. One you can read. One you can hold. By Friday yours is the one you can hold.”

Day 2 do now (stack, day 10): “Draw one wall of your room straight on (an elevation) at $1/2$ inch = 1 foot: the floor line, the window, and the furniture that sits against that wall. Rooms are usually 8 feet high.” Two minutes, one to compare.

Day 3 do now (stack, day 11): “Draw a plan of any room with a wheelchair turning circle in it: a circle 5 feet across. Where does it fit and what did you move to make room?” Two minutes, one to compare.

Procedure

Day 1: walls and floor

Step	Teacher will	Students will	Time
1. Demo: scale on the box	Slides 2 to 5. A shoebox is about 13 by 8 inches inside. At $1/2$ inch = 1 foot that holds a room 26 by 16 feet, so every client room fits at the plan’s scale. State the rule: the model scale is written on the model. If a team uses a bigger box or foam board, 1 inch = 1 foot is allowed and must be written. Show how to mark the plan’s dimensions on the box floor with a ruler, draw the door opening on the wall and cut it (teacher station), and mark the window as a cut or a drawn frame.	Watch. Take the build guide and the box or base.	8 min

	Tiny house: the box is 8 by 24 feet at 1/2 inch = 1 foot, which is 4 by 12 inches; the loft is a card shelf glued 4 feet (2 inches) below the box rim.		
2. Build: walls, floor, openings	Circulate. Check each team's box against its plan before anything is glued: door on the right wall, window on the right wall, closet in the right corner. Run the cutting station for door openings.	Mark the room's outline and openings on the box. Cut or mark the door and window. Build any extra wall (closet, bathroom wall in the tiny house) from card. Lay the floor covering (paper, felt, fabric, a printed wood pattern) and glue it.	22 min
3. Station check	Slide 6. Call the station check: glue caps on, scraps in the scrap bin (not the trash; scraps are tomorrow's furniture), model on the shelf with the team name on masking tape.	Clean the station. Shelve the model.	3 min

Closure Day 1 (2 min): thumbs check, "my walls and floor match my plan" (up), "one thing is off" (sideways), "I need a new box" (down). Fix the downs before Day 2.

Day 2: furniture and color

Step	Teacher will	Students will	Time
1. Demo: furniture from scrap and the color scheme	Slides 7 to 10. Show three pieces made in ninety seconds: a bed (a folded card box with a fabric scrap), a desk (a	Watch. Pull the color card and plan from the folder.	7 min

	card rectangle on four toothpick or rolled-paper legs), a dresser (a stacked card block with drawn drawers). Every piece measured from the cut-out sheet dimensions at the model scale. Then color: pull the Lesson 4.8 color cards. The walls get the main color, one accent on the focal point (a headboard, a rug, a chair), and the scheme is named on the label. Say the rule: the color goes on before the furniture goes in.		
2. Build: color, then furniture	Circulate. Hold every team to the plan: "Your plan has the bed on the window wall. Your model has it on the door wall. Which one is right?" Push on the principles: where is the focal point; is the room balanced; is that bed in proportion to the room?	Color the walls (paper, paint chips, marker, or fabric). Build every piece on the plan from card and scrap, to scale. Place the furniture where the plan says. Do not glue furniture until it matches the plan.	25 min
3. Station check	Same as Day 1.	Clean, shelve.	3 min

Closure Day 2 (2 min): exit card, "My color scheme is . ***The focal point is*** . Tomorrow I still need to make ____." Sort so you know which teams need the first ten minutes of Day 3 for furniture.

Day 3: finish, labels, client card, justification

Step	Teacher will	Students will	Time
1. Demo: the labels and the justification	Slides 11 to 13. Two label cards go on the model: GREEN (one green choice from Lesson 4.5: an LED lamp, a secondhand piece, a low-VOC paint, a rug from recycled fiber, a window placed for daylight, a plant) and SAFE (one safety feature from Lesson 4.2: a night light on the path, a cordless blind, a smoke alarm on the ceiling, a rug taped down or no rug, a crib away from the window, a 36-inch clear path). Each label says the feature and why it matters to this client, in one sentence. The client card is mounted on the outside of the box. The justification card, two sentences: sentence one names the biggest design choice and the client need it serves; sentence two names the principle of design it uses. Model it on the board for the Okafor room.	Watch. Take the label cards.	6 min
2. Finish and label	Circulate with the clipboard check (below). Glue the	Finish every piece from the plan. Mount the labels,	22 min

	furniture. Add the window treatment, the lamp, the plant, the rug. Write and mount the two labels, the client card, and the justification. Write the scale on the model.	the client card, and the justification. Write the scale on the box rim.	
3. Self-check against the rubric	Slide 14. Hand back Rubric 04. Each team reads criterion 4 (the model and design principles) and marks its own level. Preview Lesson 4.15: the pitch and the gallery walk; the plan, the Budget Sheet, the model, and the do-now stack are all turned in tomorrow.	Self-score criterion 4. Fix one thing if there is time. Shelve.	5 min

Closure Day 3 (2 min): one sentence on a sticky note on the model: “The client will notice ___ first.” Read three aloud.

Questions to ask

Monitor understanding:

- What scale is your model? How long is your bed in inches on the model, and how long is it in feet in real life?
- Where is your green label? Why does that choice matter to this client, not just in general?
- Which wall has the focal point, and what color is on it?

Deepen learning:

- The plan said the desk fits under the window. Now that the wall has height, does the window sill hit the desk? What did the plan hide?
- A tiny house team put the couch under the loft. Can a person stand up there? What does a model show that a plan cannot?
- If the client walked in and saw this model, what would they ask you to change first? Would you agree?

Check for understanding

Day 3 clipboard check, one line per team: “model matches the plan” (door, window, every piece placed as drawn), “color scheme named and applied,” “GREEN and SAFE labels each give a reason for this client,” “scale written,” “justification has a need and a principle.” Four or five yeses is a Meets on criterion 4 before the pitch. A no on “matches the plan” gets the question “which one is right” and a fix.

Closure (Time: 2 min each day)

Written above under each day.

Differentiation and supports

- ELL: the build guide is a picture sequence (six drawings, one per step); label cards have the frame “This is . ***It is green / safe because the client*** ”; the words wall, floor, door, window, glue, cut, and label in Turkish, Portuguese, and Spanish on the guide (see Vocabulary 04.md); the justification may be dictated to a partner or written in the home language with a translation line.
- IEP and 504 (general): pre-cut wall pieces and door openings by the teacher; pre-folded bed and desk blanks; a larger scale (1 inch = 1 foot on foam board) for fine-motor needs; a team of two so the building is shared; extended time: the labels can be finished during the first ten minutes of Lesson 4.15; a student who cannot use scissors or glue safely directs a partner’s hands and owns the labels and the justification.
- Grade 6 support: build the five required pieces only (bed or crib, one seat, one work or storage surface, one storage piece, one light); one label (GREEN or SAFE, student’s choice); a one-sentence justification.
- Grade 8 stretch: build one wall elevation on card that lifts off to show the wall’s height and window; add a third label, ACCESSIBLE, for any universal design feature (bed height, desk knee space, rod height, switch height), with the measurement; tiny house teams build the loft with the ladder to scale.
- UDL checkpoint used: multiple means of action and expression (a shoebox model, a foam board model, or the isometric drawing alternative all meet criterion 4) and multiple means of representation (the plan, the elevation do now, and the model show the same room three ways).
- No-materials alternative: a student or team with no box and no materials, or a class with no craft budget, draws the room in 3-D on the isometric grid page of the build guide: the floor as a parallelogram at 1/2 inch = 1 foot, walls up 8 feet, every piece of furniture as a box drawn to scale, the color scheme colored in, and the GREEN and SAFE labels drawn as callouts. A digital version in any free 3-D room app is also accepted, printed or shown on a screen at the gallery walk [*Sal: name the app the school allows*]. Criterion 4 is scored the same way.

Assessment

Objective	Standards met	Learning task	Assessment (formative or
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			summative; tool)
1. Build walls and floor to a stated scale matching the plan	EDM 2. b); PSI 2. a) f.; CDOS 3a Technology	Day 1, Step 2	Formative; thumbs check Day 1; summative on Rubric 04 criterion 4
2. Furnish, color, and label green and safe	EDM 2. a), c), d); SUS 2. f); Std 2 PI B; National FCS 11.4.4, 11.9.1	Day 2, Step 2; Day 3, Step 2	Formative; clipboard check Day 3; summative on Rubric 04 criterion 4
3. Justify the biggest design choice	EDM 2. c); National FCS 11.4.4	Day 3, Step 2, justification card	Formative today; summative when read aloud in the pitch (Rubric 04 criteria 4 and 5)

Homework

None. Optional: bring one scrap from home (a fabric square, a paint chip, a piece of a cereal box) that matches your client's color scheme. It goes in the model.

Connections

Art: the art teacher can lend the isometric grid lesson and the color mixing from Lesson 4.8; FACS gives art a real client and a real budget. Technology: if the school has a technology or engineering class, the model is a prototype in the same design process the PSI theme describes; the two teachers can share the design process language. Custodial staff or a local contractor: five minutes in Day 1 on how a real wall is framed and why an interior door is 30 to 36 inches wide.

Sources

- NYS Middle Level CTE FACS Content Module 04, Environmental Design and Management (nyctecenter.org, June 2018), lines 2. a), b), c), d). Copy in 02 Standards/NYS Module PDFs/. The module's Problem Solving and Innovation illustrative activity (Tiny Houses) is the source of the tiny house path.
- NYS Middle Level CTE Theme Module, Problem Solving and Innovation, line 2. a) f.; Theme Module, Sustainability, line 2. f). Same folder.
- NYS Learning Standards for Health, Physical Education, and Family and Consumer Sciences (1996), Standard 2, Intermediate. Wording per 02 Standards/STANDARDS SOURCES - web research.md, section 2. *[Sal: confirm against the NYSED PDF.]*
- National Standards for Family and Consumer Sciences Education 3.0 (LEAD FCS Education, 2018), competencies 11.4.4 and 11.9.1, per 02 Standards/STANDARDS SOURCES - web research.md, section 4.11. (The research file confirmed only 11.9.1 under 11.9; check the LEAD FCS PDF for others.)

- Sal's own materials:
education_teachingwork_dream_home_challenge_2026_04.docx (the synthesis of elements, principles, color, and sustainability in one room);
education_teachingwork_sustainable_style_2026_04.docx (the green choices used in Lesson 4.5 and on the GREEN label);
education_teachingwork_color_me_impressed_2026_04.docx (the color schemes from Lesson 4.8).

Teacher notes

- If Day 1 runs short, skip the floor covering; it can go in on Day 2 under the furniture. If Day 3 runs short, the labels and justification finish in the first ten minutes of Lesson 4.15 and the pitches start at minute 12.
- Common mistake: furniture built to no scale (a bed the size of the room). Keep the cut-out sheet dimensions on the slide all three days and make students measure the model piece against the plan piece.
- Common mistake: the model drifts from the plan because a piece “looked better” somewhere else. That is allowed, but the plan must change too; the rubric scores the match. Say it on Day 2.
- Glue gun rule: one station, one adult, low-temperature guns only, no walking with a hot gun. Treat a burn as a burn (Lesson 1.3): cool water, tell the teacher.
- Materials cost per model, target under \$4: shoebox free; one 20 by 30 foam board sheet at about \$3 to \$4 makes two or three bases if boxes run short (so \$1.50 or less per model); card stock about \$0.30; glue sticks about \$0.25 per model; scrap fabric and paint chips free (ask a fabric store for remnants and a paint department for old chip cards); masking tape and markers from the room stock. Budget about \$2 to \$3.50 per model *[update with your store's prices]*. Add it to the unit plan's materials list.
- *[Sal: photograph every finished model, no names, no faces. They are next year's hook, the website's project page, and the principal's walk-through in one shelf.]*