Tiny Home Design

Students Create a Scaled Floor Plan for a Compact Living Space

Grade Level: 4–8 Time Required: 45–60 Minutes

Tiny homes have become a popular way to maximize living space while using fewer materials and resources. In this activity, students become architects by designing a compact home that is both functional and comfortable. Using graph paper and drafting tools, students will create a scaled floor plan that includes essential living areas while practicing measurement, geometry, and creative problem-solving.

Students will learn how architects organize space, use scale drawings, and communicate ideas through technical illustrations. As they work through the project, they will consider room placement, traffic flow, furniture arrangement, and efficient use of space.



Learning Objectives

Students will:

- Create a scale drawing using graph paper.
- Practice accurate measuring and drafting techniques.
- Apply geometry concepts to real-world design.
- Develop spatial reasoning skills.
- Design an efficient living space.
- Improve technical drawing accuracy.
- Present and explain design decisions.

Materials Needed

- Graph paper
- Drafting pencils
- Ruler
- Triangular scale (optional)
- Compass
- Templates
- Eraser
- Colored pencils (optional)
- Fine-tip markers (optional)

Vocabulary

Blueprint – A detailed technical drawing used to communicate a design.

Scale Drawing – A drawing where measurements are reduced or enlarged proportionally.

Floor Plan – A top-down view showing the layout of rooms inside a building.

Dimension – A measurement shown on a drawing.

Architect – A professional who designs buildings and structures.

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Project Instructions

Step 1 — Understand the Design Challenge

Students are challenged to design a tiny home that provides everything a person needs while fitting within a limited amount of space.

Example building size:

20 feet × 30 feet

Teacher Note:

Students may use another size if desired.

Step 2 — Select a Scale

Choose an appropriate drawing scale.

Example:

1 square = 1 foot or 2 squares = 1 foot

Using a consistent scale teaches students how engineers and architects communicate dimensions accurately.

Step 3 — Plan the Rooms

Students should include:

- Living Room
- Kitchen
- Bathroom
- Bedroom
- Storage Area
- Entry Door
- Windows

Encourage students to think carefully about how each space connects to the others.

Step 4 — Draw the Floor Plan

Using drafting tools:

- Draw exterior walls.
- Add interior walls.
- Include doors and windows.
- Label every room.
- Add room measurements.
- Keep lines straight and clean.

Students should erase construction lines once the drawing is complete.

Step 5 — Add Furniture

Sketch simple furniture layouts such as:

- Bed
- Sofa
- Table
- Chairs
- Kitchen cabinets
- Refrigerator
- Sink
- Toilet
- Shower

Furniture placement helps students understand how space is used efficiently.

Extension Activities

Students who finish early can expand their design by adding:

- Solar panels
- Rainwater collection
- Outdoor patio
- Garden
- Garage
- Loft bedroom
- Wheelchair accessibility
- Smart home technology

These additions encourage students to consider sustainability and modern engineering solutions.

Classroom Discussion

Ask students:

- Why did you place rooms where you did?
- Which room was the most difficult to design?
- How did using a scale help your drawing?
- What changes would improve your design?
- How do architects balance space and functionality?

Encourage students to compare different layouts and explain the reasoning behind their choices.

Assessment Checklist

☐ Used the correct drawing scale

☐ Included all required rooms

☐ Drew straight, accurate lines

☐ Clearly labeled each room

☐ Added measurements

☐ Demonstrated efficient use of space

☐ Created a neat, organized floor plan

☐ Explained design decisions during presentation

Real-World Connections

Architects, engineers, interior designers, and construction professionals rely on technical drawings to communicate ideas before building begins. By designing a tiny home, students experience the same planning process used in real-world architecture and engineering projects while strengthening their skills in mathematics, problem-solving, creativity, and technical communication.