

Project Based Learning

Area, Perimeter, & Geometry



BUILD A TINY HOUSE

Area, perimeter, and geometry are hiding in your house.

BUILD A TINY HOUSE



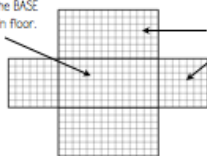
← name →

ROUGH DRAFT: INSTRUCTIONS

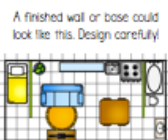
On the following page you will create a rough draft of the completed house.

This rough draft will be used as a blueprint and will include all items from the Requirement List. The Requirement List will be included on the page. Check off each item once you have included it.

This is the BASE and main floor.



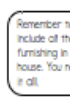
The house looks like the four walls have been laid down.



A finished wall or base could look like this. Design carefully!



As you design the layout, you may have to turn your paper so your drawings match up.



Remember to include all the furnishings in your house. You need it all.



Refer back to the directions and look at the examples to help you out.

BEFORE YOU BEGIN...

WHAT IS A TINY HOUSE?

Most people will say that a tiny house is a home with less than 400 square feet of space. Four hundred might sound like a lot, but it is probably only half the size of most classrooms.

Many times, tiny houses are built on wheels. This means they are mobile and can be moved to different locations. A lot of tiny house owners like this because they can live in different areas or even in someone's backyard (as long as it's big enough).

WHO LIVES IN TINY HOUSES?

Anyone can live in a tiny house. It doesn't matter if it is a single person or a family of 5 or more. A tiny house is just like any other home, except it's much smaller.

WHY LIVE IN A TINY HOUSE?

1. It is much cheaper than buying a larger home. Many people don't want to have large mortgages or monthly payments, so a tiny home fits their needs best.
2. Many owners don't need a lot of space. A small home is just perfect for what they need.
3. It can be an adventure! It's new, it's fun, and people like the challenge of living small.

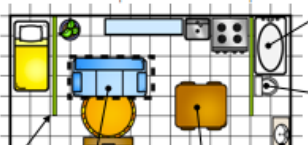
TINY HOUSE PARTS

More important things to know.

After you have created the layout you will have to find the area and perimeter of items in the house. Not all items will be exactly perfect, so estimate as close as you can.

You will design the base using a bird's eye view. Imagine looking straight down as you add in the furniture and lay it all out.

This is an example of a BASE floor plan.



BATHTUB
AREA: 6 square units
PERIMETER: 10 units

TOILET
AREA: 1 square unit
PERIMETER: 4 units

SINK
AREA: 2 square units
PERIMETER: 6 units

COUCH
AREA: 8 square units
PERIMETER: 10 units

TABLE
AREA: 4 square units
PERIMETER: 12 units



You can add your own walls too!

TINY HOUSE TO-DO LIST

| FIRST: | DIRECTIONS | Read ALL the directions in TINY HOUSE PARTS. VERY IMPORTANT! Refer back to them as much as you need. |
|----------|--------------------|---|
| SECOND: | ROUGH DRAFT | Create a rough draft of your tiny house and include all items on requirements list. |
| THIRD: | FINAL VERSION | Create a final version of the tiny house. There are 4 pages for the Base, Walls, and Roof. Check off each item from the requirement list. |
| FOURTH: | SPEC HOME 1 | Record the area, perimeter, and geometric shape of each item from the requirement list on. |
| FIFTH: | SPEC HOME 2 | Record the area and perimeter of the major sections of the house (base, walls, roof). |
| SIXTH: | BUILD THE HOUSE | Cut out each of the four sections of the house and fit them together. |
| SEVENTH: | EXTERIOR | Continue your design and decorate the outside of your house. |
| EIGHTH: | REFLECTION | Answer questions about the house design and reflect on your creation. |
| NINTH: | BUILDING FURNITURE | OPTIONAL: Create 3D nets of furnishings in your house. There is a page included or you may use graph paper included. |
| TENTH: | HOUSING PROBLEMS | OPTIONAL: Create area and perimeter word problems for your house and have other students solve them. |

TINY HOUSE PARTS

Things To Know

REQUIREMENTS LIST

Your house will have a list of items that must be included.

This will be a list items for the floor plan and the walls. You will decide where to put all of the items.



AREA & PERIMETER

As you create the layout of the house, you will need to find the area and perimeter of items from the requirement list.

Units will be the measurement used for perimeter and area.

Example:
-Perimeter is 24 units
-Area is 26 square units (for units squared)

BE PREPARED!

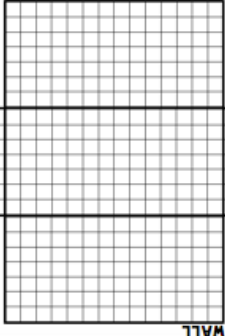
Your house must make sense and fit together. You will want to make sure the layout makes sense.

ROUGH DRAFT: BLUEPRINTS

Create your rough draft of the tiny house. Check off each item after you add it to your house.

| | |
|---------------|--|
| shower or tub | |
| bathroom sink | |
| toilet | |
| bed | |
| table | |
| chair | |

WALL



| | |
|----------------|--|
| shower/tub | |
| bathroom sink | |
| TV or computer | |
| refrigerator | |
| front door | |

WALL

| | |
|------------------------|--|
| closet | |
| desk or side table | |
| couch/sofa or recliner | |
| counter | |
| microwave | |

| | |
|--------------------|--|
| window | |
| window | |
| picture/television | |
| mirror | |

SPEC HOME

Find the area, perimeter, and list the shape of each required item in your house. Fill in the information below.

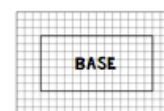
| ITEM | PERIMETER | AREA | SHAPE |
|------------------------|-----------|------|-------|
| shower or tub | | | |
| bathroom sink | | | |
| toilet | | | |
| bed | | | |
| table | | | |
| chair | | | |
| closet | | | |
| desk or side table | | | |
| couch/sofa or recliner | | | |
| counter | | | |
| microwave | | | |

TINY HOUSE PARTS

There are four major part of the house that you will build and design.

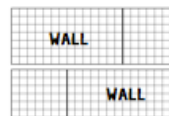
THE BASE

This is where you will create the floor plan of the house. This will be the central part of creating the house.



THE WALL, PIECE 1

Each WALL section contains two walls. They are folded to create house corners.

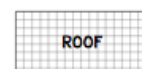


THE WALL, PIECE 2

These are the final two walls in the house. They can be cut out and create a rectangle that fits exactly around the base of the house.

THE ROOF

The final part of the house (that is still important). You will decide what goes on it.



Each of the MAJOR PARTS will be on separate pieces of paper. They can be cut out and placed together to form a tiny house in the shape of a rectangular prism.

FINAL VERSION: REQUIREMENT LISTS

Listed below are all the furnishing elements that must be included inside your tiny house. Check off each item once it has been added in your house design.

| ITEM | COMPLETED | ITEM | COMPLETED |
|------------------------|-----------|-----------------|-----------|
| shower or tub | | stove/oven | |
| bathroom sink | | kitchen sink | |
| toilet | | TV or computer | |
| bed | | refrigerator | |
| table | | front door | |
| chair | | window | |
| closet | | window | |
| desk or side table | | light | |
| couch/sofa or recliner | | light | |
| counter | | picture/artwork | |
| microwave | | mirror | |

SPEC HOME

Find the AREA and Perimeter of each the tiny house's base, four walls, and roof.

| ITEM | PERIMETER | AREA |
|------------|-----------|------|
| House Base | | |
| Wall One | | |
| Wall Two | | |
| Wall Three | | |
| Wall Four | | |
| Roof | | |

| ITEM | PERIMETER | AREA |
|------|-----------|------|
| Yard | | |

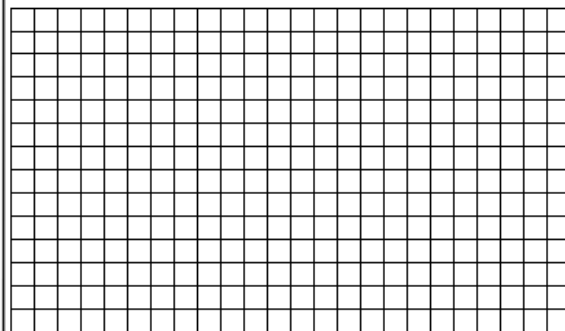
SPEC HOME

Find the AREA, Perimeter, and Shape of each required item in your house. Fill in the information below.

| ITEM | PERIMETER | AREA | SHAPE |
|-----------------|-----------|------|-------|
| stove/oven | | | |
| kitchen sink | | | |
| TV or computer | | | |
| refrigerator | | | |
| front door | | | |
| window | | | |
| window | | | |
| light | | | |
| light | | | |
| picture/artwork | | | |
| mirror | | | |

THREE-DIMENSIONAL PIECES

Use this graph paper to create your own three-dimensional furniture for the house.



EXTERIOR DESIGN



Awesome!
You designed your house and the inside looks great!
But-- you need to decorate the outside too.
Make it look like a house.

BE CAREFUL with your coloring!

- ONLY USE crayons or colored pencils.
- Markers could bleed through and ruin the inside.
- Look at some pictures of houses to see what the outsides look like.

WINDOWS and DOORS

- If you are up to the challenge, try cutting out where you have windows.
- Be patient and work slow.

OUTDOOR SIDING

- Decide what kind of exterior you want for your house: wood, stucco, log cabin, or something else.
- Color it or add designs, just be creative.



HOUSING PROBLEMS

Create area or perimeter word problems based the items in your house. Then give your problems to another student for them to solve.

3. _____

4. _____

SOLVE

SOLVE

BUILDING FURNITURE

It's time to build your furniture by creating three dimensional shapes. You may use two provided graphing sheets with furniture already included or you may create your own.

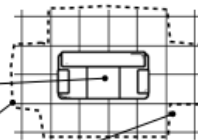
FIRST: Make sure your furniture size matches what you created in your house.

SECOND: Remember that 3D means you'll have to make all the sides. Minecraft and LEGOS are good reminders. Use those to help you.

THIRD: Don't cut out the net until you are sure you have enough. Map out what you need.

FOURTH: Tape your shapes together. You can try glue, but it might not work as well.

FIFTH: DON'T get discouraged. This is a very difficult element of design. It will take you a while to master it...but you can do it!



For this couch, I would cut out on my dotted line and tape the 4 sides together.

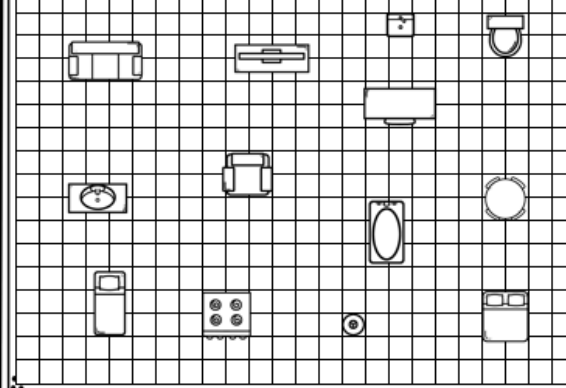
WALLS: If you created walls--add those!

DON'T TAPE OR GLUE ANYTHING TO YOUR HOUSE. UNLESS YOUR TEACHER SAYS YOU CAN!

REFLECTION

| AREA NEEDS MORE WORK | CRITERIA | EVIDENCE OF EXCEEDING STANDARD |
|----------------------|---|--------------------------------|
| | Student completed steps 1-8 on the To-Do List | |
| | Demonstrates an understanding of finding area and applying it correctly. | |
| | Demonstrated an understanding of finding perimeter and applying it correctly. | |
| | Demonstrated an understanding of identifying geometric shape correctly. | |
| | Connected the concepts of area, perimeter, and geometric shapes to real-world settings (building a house) | |
| | Applied problem-solving skills to complete the activity. | |
| | Applied collaboration skills to complete the activity. | |

THREE-DIMENSIONAL PIECES



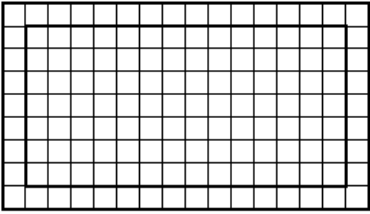
SPEC HOME


Find the area, perimeter, and list the shape of each required item in your house.
Fill in the information below.

| ITEM | PERIMETER | AREA | SHAPE |
|------------------------|-----------|------|-------|
| shower or tub | | | |
| bathroom sink | | | |
| toilet | | | |
| bed | | | |
| table | | | |
| chair | | | |
| closet | | | |
| desk or side table | | | |
| couch/sofa or recliner | | | |
| counter | | | |
| microwave | | | |

FINAL VERSION: ROOF & CEILING

Include any remaining items to the roof and ceiling. If you already added all the items...great!
Feel free to add other items you think would go on a house ceiling.



 So you know, the dark outline is inside your house. There is a single row that will overhang over the side. You could add lighting or other home items to it.

HOUSING PROBLEMS

Create area or perimeter word problems based the items in your house.
Then give your problems to another student for them to solve.

1. _____

2. _____

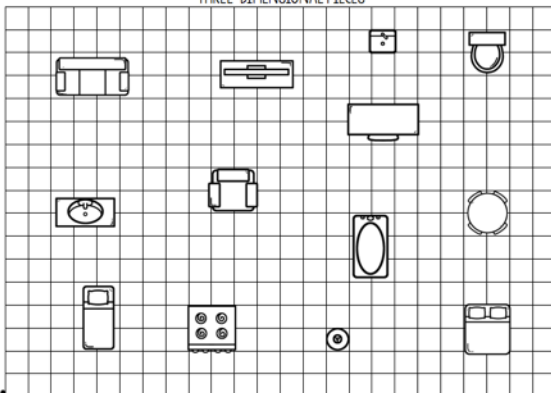
3. _____

SOLVE

SOLVE

SOLVE

THREE-DIMENSIONAL PIECES



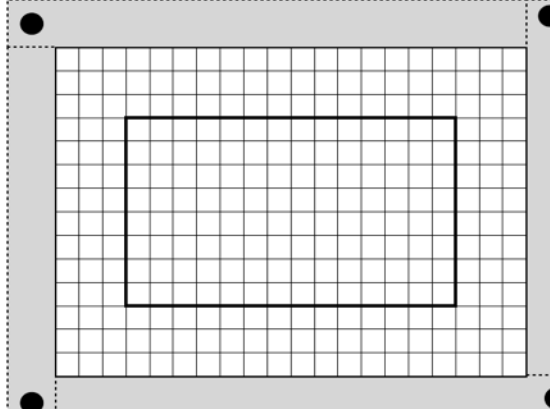
SPEC HOME

Find the AREA and Perimeter of each REQUIRED item in your house.
Fill in the information below.

| ITEM | PERIMETER | AREA |
|------------------------|-----------|------|
| shower or tub | | |
| bathroom sink | | |
| toilet | | |
| bed | | |
| table | | |
| chair | | |
| closet | | |
| desk or side table | | |
| couch/sofa or recliner | | |
| counter | | |
| microwave | | |

| ITEM | PERIMETER | AREA |
|-----------------|-----------|------|
| stove/oven | | |
| kitchen sink | | |
| TV or computer | | |
| refrigerator | | |
| front door | | |
| window | | |
| window | | |
| light | | |
| light | | |
| picture/artwork | | |
| mirror | | |

USE THIS FOR IF YOU WOULD LIKE TO CREATE A 3D BASED FOR YOUR HOME.



CUT ON DASHED LINE. FOLD DOWN ON BOLD LINE. GLUE EDGES WITH CIRCLES ON THE FOLD NEXT

SCORING RUBRIC

STUDENT NAME: _____

| CRITERIA | NET STANDARD | | | | AREA NEEDS MORE WORK |
|--|-----------------------|---|---|---|----------------------|
| Student completed steps 1-8 on the To-Do List | 5 | 4 | 3 | 2 | 1 |
| Demonstrates an understanding of finding area and applying it correctly. | 5 | 4 | 3 | 2 | 1 |
| Demonstrated an understanding of finding perimeter and applying it correctly. | 5 | 4 | 3 | 2 | 1 |
| Demonstrated an understanding of identifying geometric shape correctly. | 5 | 4 | 3 | 2 | 1 |
| Connected the concepts of area, perimeter, and geometric shapes to real-world settings (building a house). | 5 | 4 | 3 | 2 | 1 |
| Applied problem-solving skills to complete the activity. | EVIDENCE OF EXCEEDING | | | | |
| Applied collaboration skills to complete the activity. | EVIDENCE OF EXCEEDING | | | | |

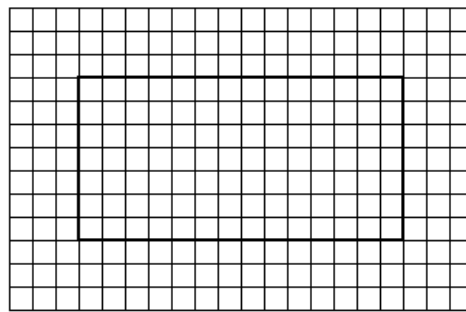
SCORING RUBRIC

STUDENT NAME: _____

| AREA NEEDS MORE WORK | PROFICIENT | EVIDENCE OF EXCEEDING STANDARD |
|----------------------|--|--------------------------------|
| | Student completed steps 1-8 on the To-Do List | |
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| | Demonstrated an understanding of finding perimeter and applying it correctly. | |
| | Demonstrated an understanding of identifying geometric shape correctly. | |
| | Connected the concepts of area, perimeter, and geometric shapes to real-world settings (building a house). | |
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| | Applied collaboration skills to complete the activity. | |

FINAL VERSION: BASE FLOOR PLAN

Convert your rough draft to the final version of the house.



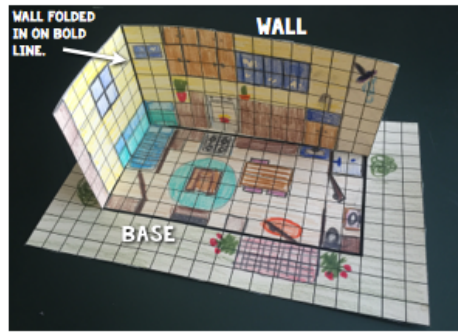
You may also design the surrounding area, which would be considered the yard.

MAKING A TINY HOUSE



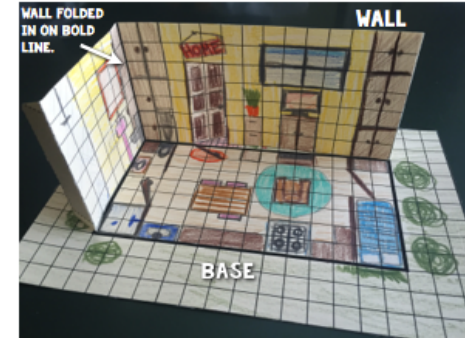
Make sure all the pieces line up with each other.
You won't need to add the roof until the end.

MAKING A TINY HOUSE



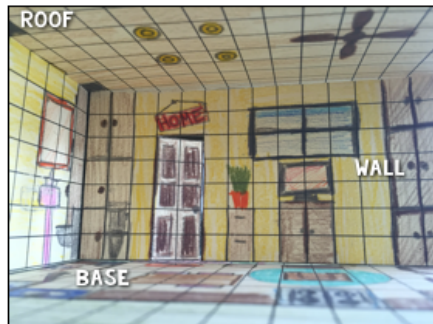
Make sure all the pieces line up with each other.
You won't need to add the roof until the end.

MAKING A TINY HOUSE



This is the same house, but opposite wall side is shown.

MAKING A TINY HOUSE



Roof/ceiling added to the top.



MAKING A TINY HOUSE



Designing the outside of the house brings the entire project together.
Crayons and colored pencils are your best choices!

MAKING A TINY HOUSE

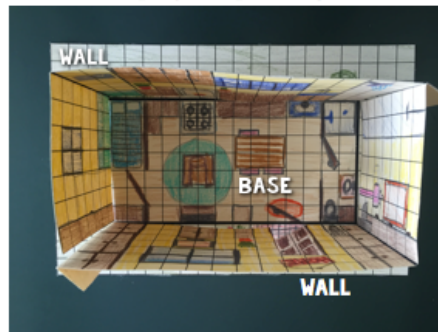
Place your 3D furnishing in the house. You can remove walls to see how it looks.



You will begin to see how much space they take up. This gives you a better idea of how important it is to be a designer.



MAKING A TINY HOUSE



Overhead view of the house pieces placed together.

MAKING A TINY HOUSE



Make sure you furnish your house with 3D objects.
There are cutouts included, but you can create many on your own.
It takes practice and patience, but your ideas are unlimited.

ABOUT THIS RESOURCE

The objective of this project is for students to design and build a TINY HOUSE, while applying area, perimeter, and geometry skills. This project based learning activity also focuses on designing elements, using multiple problem solving skills, and collaborating in the classroom. It allows for easy differentiation, so students can work at a pace they will be successful at.

With this resource students WILL CREATE a miniature 3D version of a tiny house. The size of the houses will all be the same, but each student will create a unique version based on their own ideas, imagination, and application of skills.

Build a Tiny House asks students if they can design a house that contains almost 20 different pieces of furnishings (all in one place) and then find the area and perimeter of each item after they have done so. They're also asked to apply geometric skills; such as shapes and even developing their own nets to create furniture.

This PBL activity focuses on the real-world application of math concepts used in building and designing homes, while practicing problem-solving skills (which are one of the most sought after skills in the work force today), collaboration, and using their imagination.

ABOUT THIS RESOURCE

MATERIALS NEEDED

- computer paper
- card stock (optional for the house building)
- crayons and colored pencils
- scissors
- tape and glue

UNITS

The measurement used for this project will be a single unit per cube.

You may choose to increase complexity by making each cube worth more. Use this with students to easily differentiate.

Example: 1 square = 3 units
or

1 square = 5 units

There are no feet, yard, or meters.

OPTIONAL MATERIALS

- books or magazines on building houses
- videos that show tiny houses from internet (or maybe a HGTV show)
- videos that merge math and housing together (search Youtube)

BUILD IT YOURSELF

I recommend building a house with your students. There are plenty of pictures included, but allowing them to see a hands-on version will add more for the students.

PROJECT IT!

Lots of elements of this resource work well when projected onto a smart board, tv, or white board.

Use those to help guide the students.

TIME FRAME

The time frame for completing this project will vary greatly. If you are planning on completing it in a week, give 45-60 minutes per day.

All students will work at different rates, but by the end of the week students should be finishing the required steps (1-8) or trying some of the additional tasks.

Time can vary based on many factors.

ENCOURAGE CREATIVITY

Push your students to try new ideas. At the beginning they may be hesitant, but encourage them to try new ideas. There are unlimited options in the project.



TABLE OF CONTENTS

| PAGE | CONTENT |
|-----------|---|
| 6 | About this Resource |
| 8 | Cover Page and Introduction |
| 12 | To-Do List |
| 13 | Tiny House Parts |
| 16 | Rough Draft |
| 18 | Final Version of House and Requirement List |
| 22 | Spec Home 1 and 2 |
| 25 | Exterior Design |

| PAGE | CONTENT |
|-----------|--|
| 26 | Reflection |
| 27 | Building Furniture (optional) |
| 32 | Housing Problems (optional) |
| 37 | Spec Homes (extra versions) |
| 42 | Extra Pieces |
| 46 | Teacher Rubrics |
| 49 | Making A Tiny House Projectable Page (with images) |
| 62 | Credits |

Area, perimeter, and geometry are hiding in your house.

BUILD A TINY HOUSE



«—————»
name

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Many times, tiny houses are built on wheels. This means they are mobile and can be moved to different locations. A lot of tiny house owners like this because they can live in different areas or even in someone's backyard (as long as it's big enough).

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Anyone can live in a tiny house. It doesn't matter if it is a single person or a family of five. A tiny house is just like any other home, except it's much smaller.

WHY LIVE IN A TINY HOUSE?

1. It is much cheaper than buying a larger home. Many people don't want to have large mortgages or monthly payments, so a tiny home fits their needs best.
2. Many owners don't want a lot of space. A small home is just perfect for what they need.
3. It can be an adventure! It's new, it's fun, and people like the challenge of living small.

BUILD A TINY HOUSE

If you've been watching TV or reading magazines, chances are you have seen a tiny house. These little homes are popping up everywhere! People love them. They cost less than regular homes and they can be moved around. There's even TV shows where buyers pick a tiny home that will fit their needs the best.

Your city council has been paying attention to the amazing things happening in your classroom. They want to use those skills to build and design a set of tiny houses.

You are being asked to create a tiny house that will be showed off at the Tri-City Realtor Convention. If these houses are a hit, they might choose to build them in town!

This means you'll be responsible for designing and building the perfect tiny house. It will include the layout, picking furniture, and using real-world math skills to finish this project.

Are you ready to build?

Let's go see your To-Do List...



TINY HOUSE TO-DO LIST

| | | |
|-----------------|---------------------------|---|
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| FIFTH: | SPEC HOME 2 | Record the area and perimeter of the major sections of the house (base, walls, roof/ceiling). |
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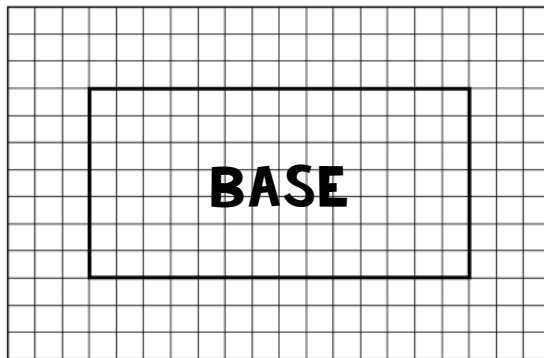
TINY HOUSE PARTS

There are four major parts of the house that you will build and design.

THE BASE

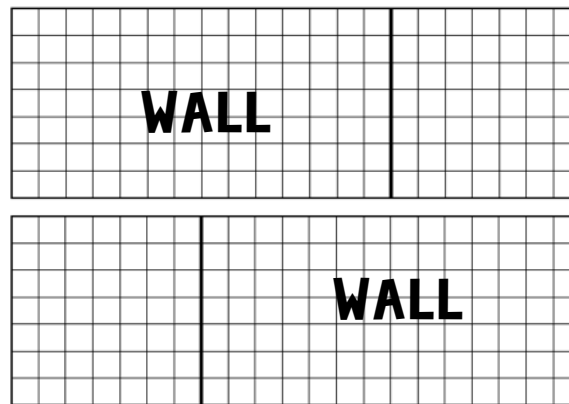
This is where you create the floor plan of the house.

This is a central part of creating the house.



THE WALL, PIECE 1

Each WALL section contains two walls. They are folded to create house corners.



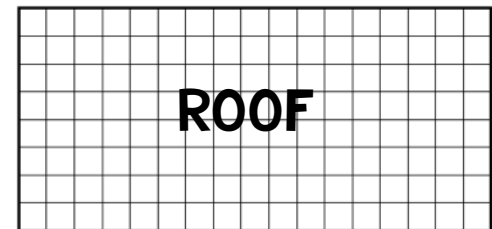
THE WALL, PIECE 2

They can be cut out to create a rectangle that fits exactly around the base of the house.

THE ROOF

The final part of the house.

You will be designing the ceiling (fans, lights, vents).



Each of the MAJOR PARTS will be on separate pieces of paper. They can be cut out and placed together to form a tiny house in the shape of a rectangular prism.

TINY HOUSE PARTS

Things To Know

REQUIREMENTS LIST

Your house will have a list of items that must be included.

This will be a list of items for the floor plan and the walls. You will decide where to put everything!



AREA & PERIMETER

As you create the layout of the house, you will need to find the area and perimeter of items from the requirement list.

Units will be the measurement used for perimeter and area.

Example:

- Perimeter is 24 units
- Area is 26 square units
(or units squared).

GEOMETRY DESIGN

Use your geometry skills to find the best solution to fitting all items into the house.

All houses are filled with geometry in real life. Use those ideas to help you make the best choices.

Math is everywhere!

BE PREPARED!

Your house must make sense and fit together.
You will want to make sure the layout makes sense.

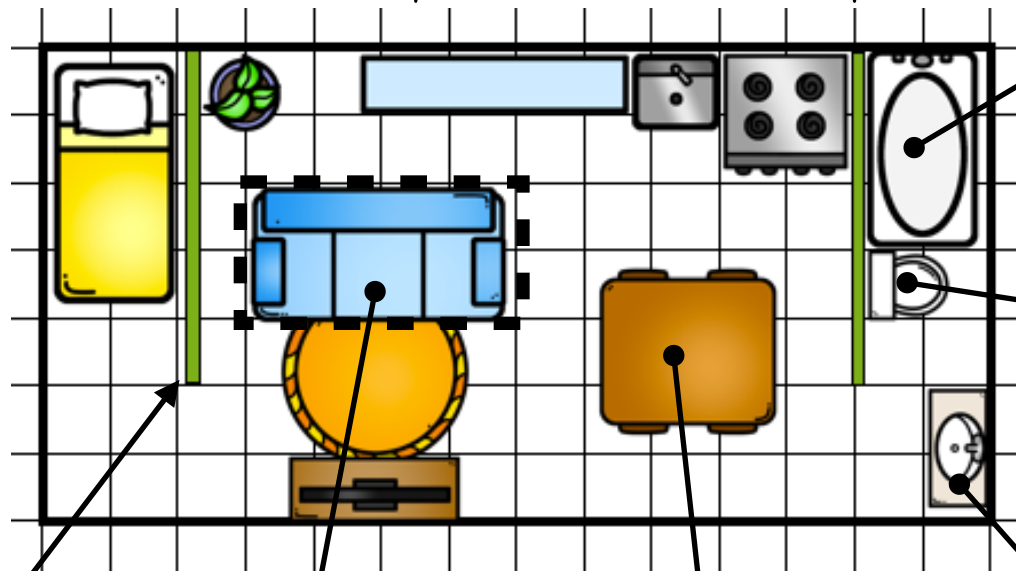
TINY HOUSE PARTS

More important things to know.

After you have created the layout, you will have to find the area and perimeter of items in the house. Not all items will be exactly perfect, so estimate as close as you can.

You will design the base using a bird's eye view. Imagine looking straight down as you add in the furniture and lay it all out.

This is an example of a BASE floor plan.



BATHTUB

AREA: 6 square units
PERIMETER: 10 units

TOILET

AREA: 1 square unit
PERIMETER: 4 units

SINK

AREA: 2 square units
PERIMETER: 6 units

COUCH

AREA: 8 square units
PERIMETER: 12 units

TABLE

AREA: 9 square units
PERIMETER: 12 units

You can add your own walls too!

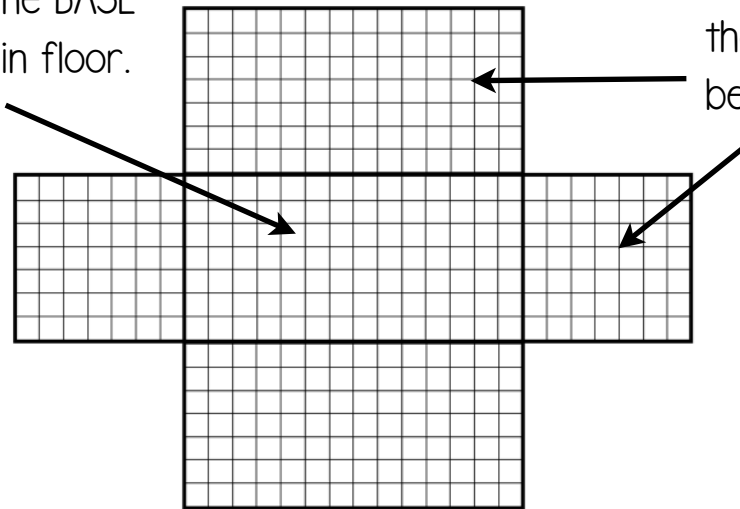


ROUGH DRAFT: INSTRUCTIONS

On the following page you will create a rough draft of the house.

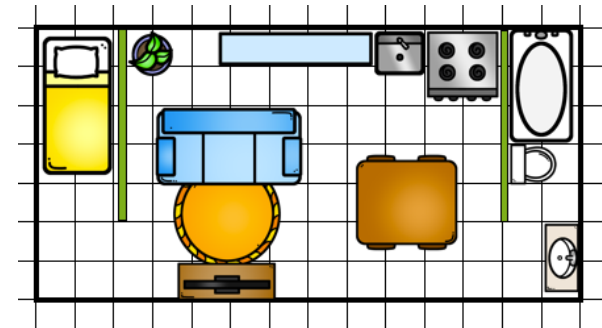
This rough draft will be used as a blueprint and will include all items from the Requirement List. The Requirement List will be included on the page. Check off each item once you have included it.

This is the BASE and main floor.



The house looks like the four walls have been laid down.

A finished wall or base could look like this. Design carefully!



As seen on the previous page.



As you design the layout, you may have to turn your paper so your drawings match up.

Include all the furnishing in your house. ADD YOUR OWN IDEAS TOO!
Make it your house!



Refer back to the directions and look at the examples to help you out.

ROUGH DRAFT: BLUEPRINTS

Create your rough draft of the tiny house. Check off each item after you add it to your house.

| | |
|---------------|--|
| shower or tub | |
| bathroom sink | |
| toilet | |
| bed | |
| table | |
| chair | |

| | |
|----------------|--|
| stove/oven | |
| kitchen sink | |
| TV or computer | |
| refrigerator | |
| front door | |

WALL

WALL

WALL

WALL

| | |
|------------------------|--|
| closet | |
| desk or side table | |
| couch/sofa or recliner | |
| counter | |
| microwave | |

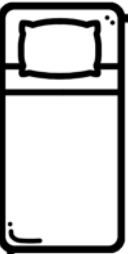
| | |
|-----------------|--|
| window | |
| window | |
| picture/artwork | |
| mirror | |

FINAL VERSION: REQUIREMENT LISTS

Listed below are all the furnishing elements that must be included inside your tiny house.
Check off each item once it has been added in your house design.

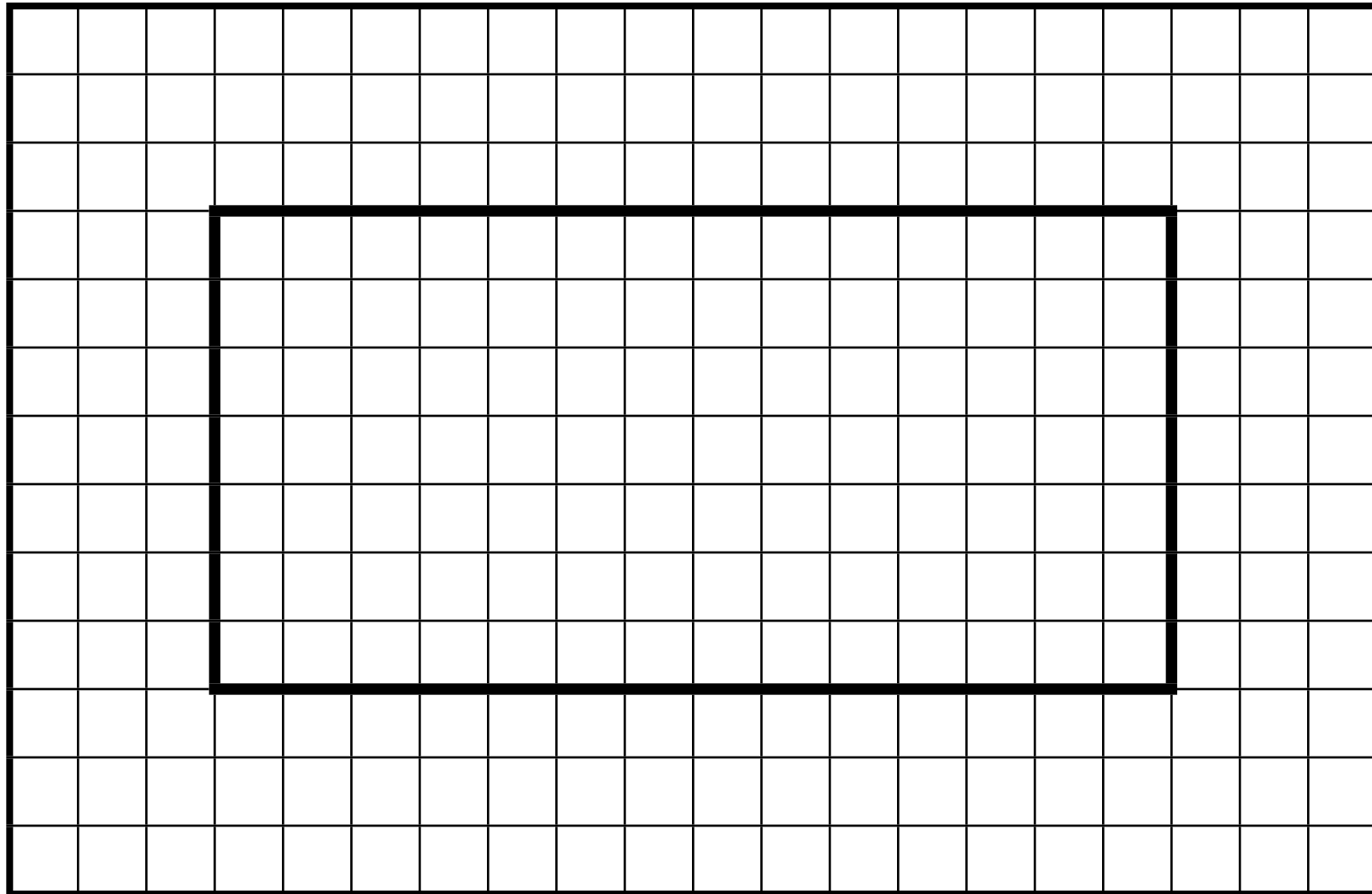
| ITEM | COMPLETED |
|------------------------|-----------|
| shower or tub | |
| bathroom sink | |
| toilet | |
| bed | |
| table | |
| chair | |
| closet | |
| desk or side table | |
| couch/sofa or recliner | |
| counter | |
| microwave | |

| ITEM | COMPLETED |
|-----------------|-----------|
| stove/oven | |
| kitchen sink | |
| TV or computer | |
| refrigerator | |
| front door | |
| window | |
| window | |
| light | |
| light | |
| picture/artwork | |
| mirror | |



FINAL VERSION: BASE FLOOR PLAN

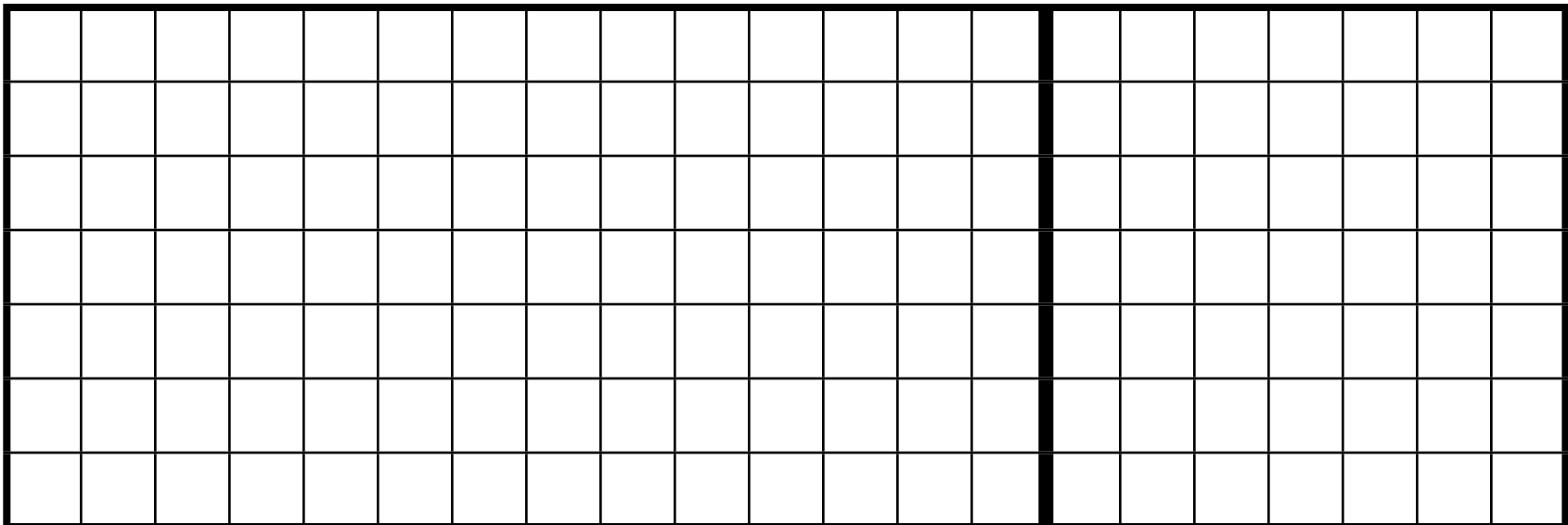
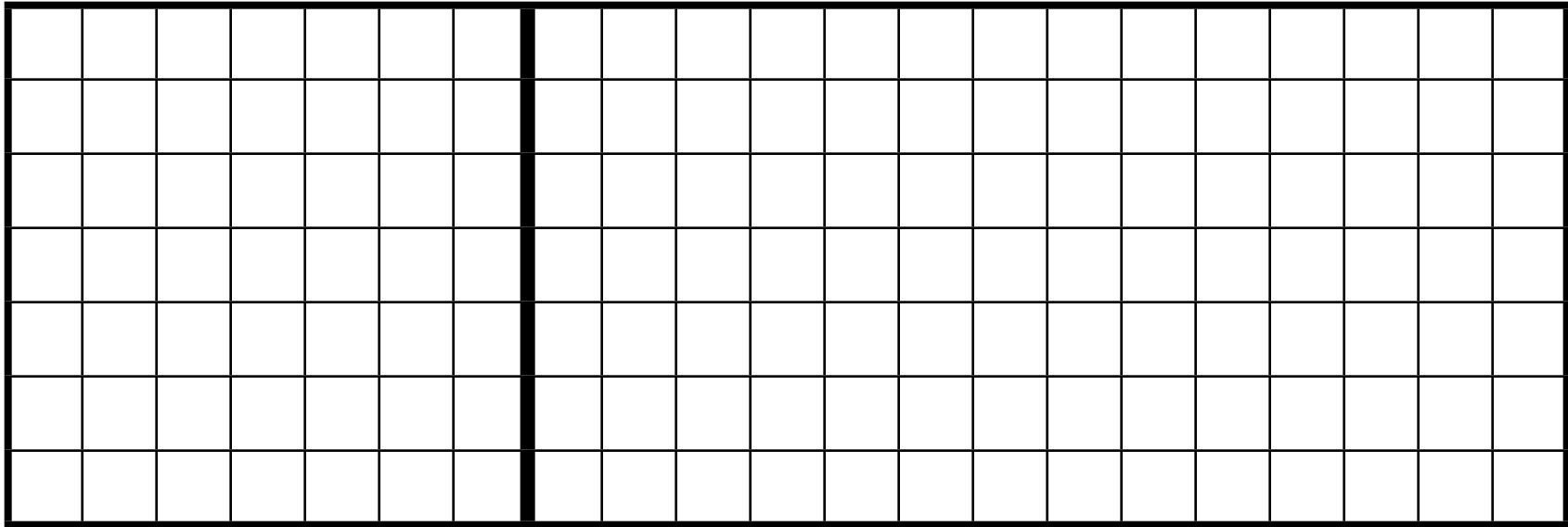
Convert your rough draft to the final version of the house.



You may also design the surrounding area, which would be considered the yard.

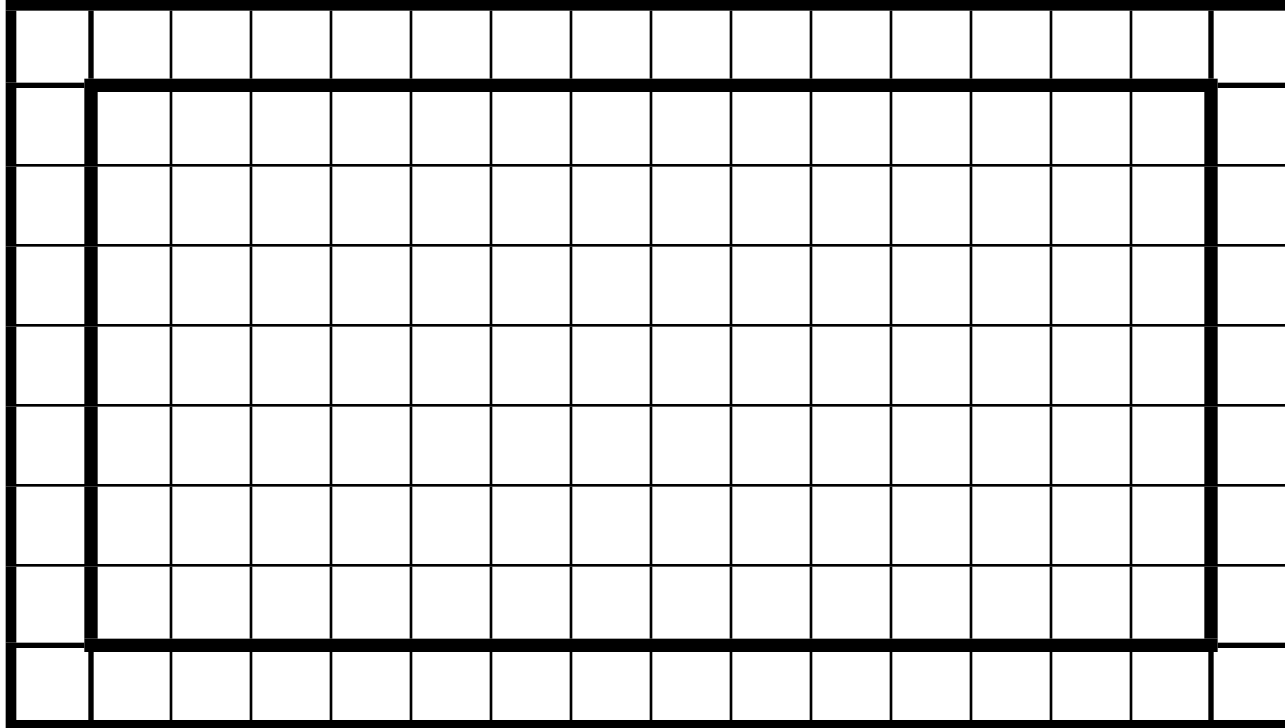
FINAL VERSION: WALLS

The inside walls of your tiny house are where you will add furnishings, create doors, windows, and finish out the design.



FINAL VERSION: ROOF & CEILING

Include any remaining items on the roof and ceiling.
Add other items you think would go on a house ceiling.



The dark outline is inside your house.
There is a single row that will hang over
the side. You could add lighting or other
home decorations to it.

SPEC HOME

Find the AREA, PERIMETER, and SHAPE of each required item in your house.

Fill in the information below.

| ITEM | PERIMETER | AREA | SHAPE |
|------------------------|-----------|------|-------|
| shower or tub | | | |
| bathroom sink | | | |
| toilet | | | |
| bed | | | |
| table | | | |
| chair | | | |
| closet | | | |
| desk or side table | | | |
| couch/sofa or recliner | | | |
| counter | | | |
| microwave | | | |

SPEC HOME

Find the AREA, PERIMETER, and SHAPE of each required item in your house.
Fill in the information below.

| ITEM | PERIMETER | AREA | SHAPE |
|-----------------|-----------|------|-------|
| stove/oven | | | |
| kitchen sink | | | |
| TV or computer | | | |
| refrigerator | | | |
| front door | | | |
| window | | | |
| window | | | |
| light | | | |
| light | | | |
| picture/artwork | | | |
| mirror | | | |

SPEC HOME

Find the AREA and PERIMETER of the base, four walls, and roof/ceiling.

| ITEM | PERIMETER | AREA |
|------------|-----------|------|
| House Base | | |
| Wall One | | |
| Wall Two | | |
| Wall Three | | |
| Wall Four | | |
| Roof | | |

| ITEM | PERIMETER | AREA |
|------|-----------|------|
| Yard | | |

EXTERIOR DESIGN



Awesome!

You designed your house and the inside looks great!
But--you need to decorate the outside.
Make it look like a REAL house!

BE CAREFUL with your coloring!

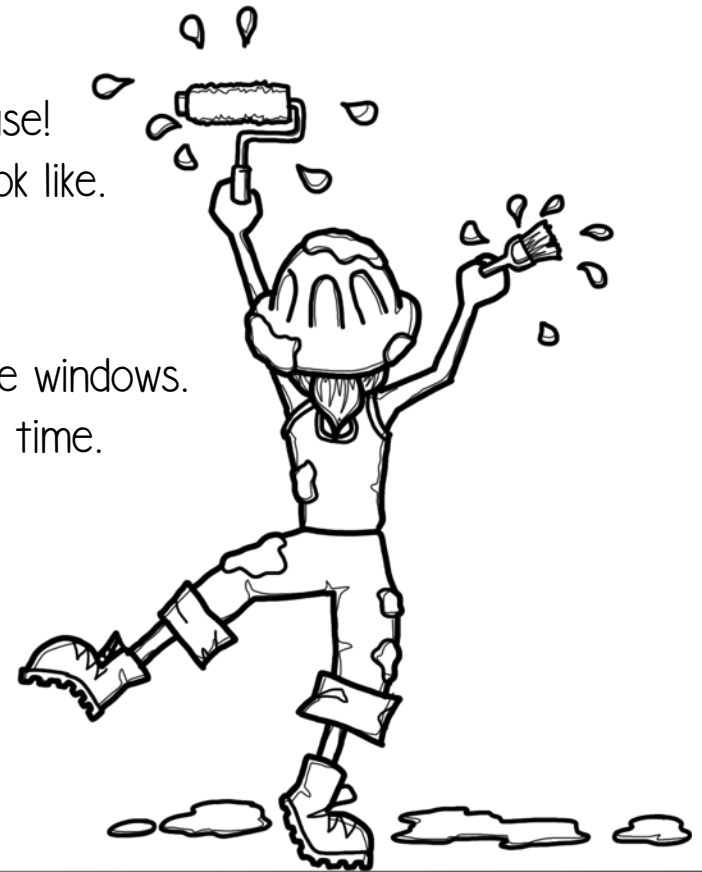
- ONLY USE crayons or colored pencils.
- Markers could bleed through and ruin the inside--no leaky house!
- Look at some pictures of houses to see what the outsides look like.

WINDOWS and DOORS

- If you are up to the challenge, try cutting out where you have windows.
- Be patient and work slow. Doors are easier, but windows take time.

OUTDOOR SIDING

- Decide what kind of exterior you want for your house:
wood, stucco, log cabin, or something else.
- Color it or add designs...just be creative.



NAME

STUDENT REFLECTION

| I CAN... | YES | NEEDS MORE WORK |
|---|-----|-----------------------|
| I completed steps 1-8 on the To-Do List. | | |
| I can find the area of an object. | | |
| I can find the perimeter of an object | | |
| I can find the area and perimeter of an object I create. | | |
| I can connect area, perimeter, and geometry to real-world situations. | | |
| I can use problem-solving techniques to complete this activity. | | |
| I can use collaboration techniques to complete this activity. | | |

THE MOST CHALLENGING PART OF THIS PROJECT WAS...

MY FAVORITE PART OF THIS PROJECT WAS...

ONE THING THAT REALLY SURPRISED ME WAS...

SOMETHING I LEARNED FROM A CLASSMATE WAS...

BUILDING FURNITURE

It's time to build your furniture by creating three dimensional shapes.
Use two provided graphing sheets with furniture included or create your own.

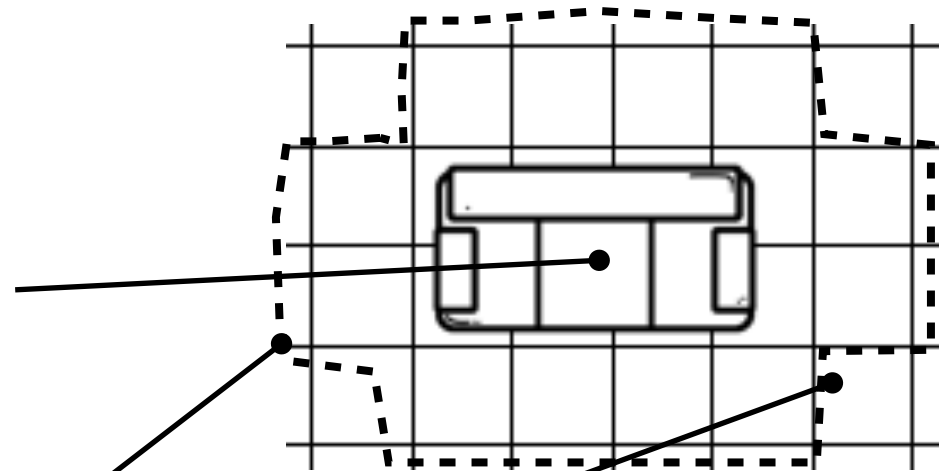
FIRST: Make sure your furniture size matches what you created in your house.

SECOND: 3D (three dimensional) means you'll have to design on all the sides. Minecraft and LEGOS are good examples.

THIRD: Don't cut out the net until you are sure you have enough. Map out what you need.

FOURTH: Tape your shapes together. You can try glue, but it might not work as well.

FIFTH: DON'T get discouraged! This is a very difficult element of design. It will take you a while to master it...but you can do it!



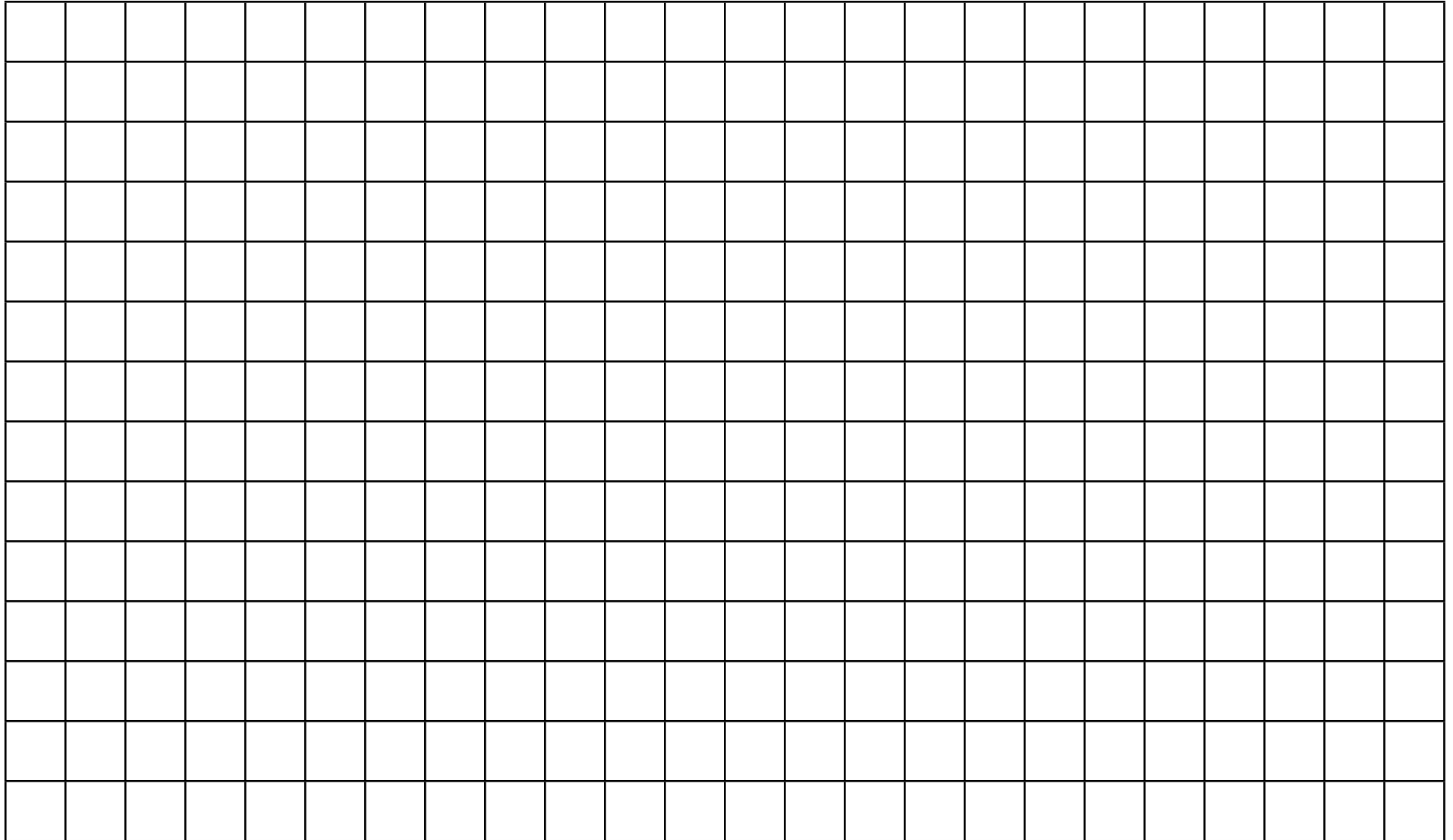
For this couch, I would cut out on my dotted line and tape the 4 sides together.

WALLS: If you created walls--add those!

**DON'T TAPE OR GLUE ANYTHING TO YOUR HOUSE,
UNLESS YOUR TEACHER SAYS YOU CAN!**

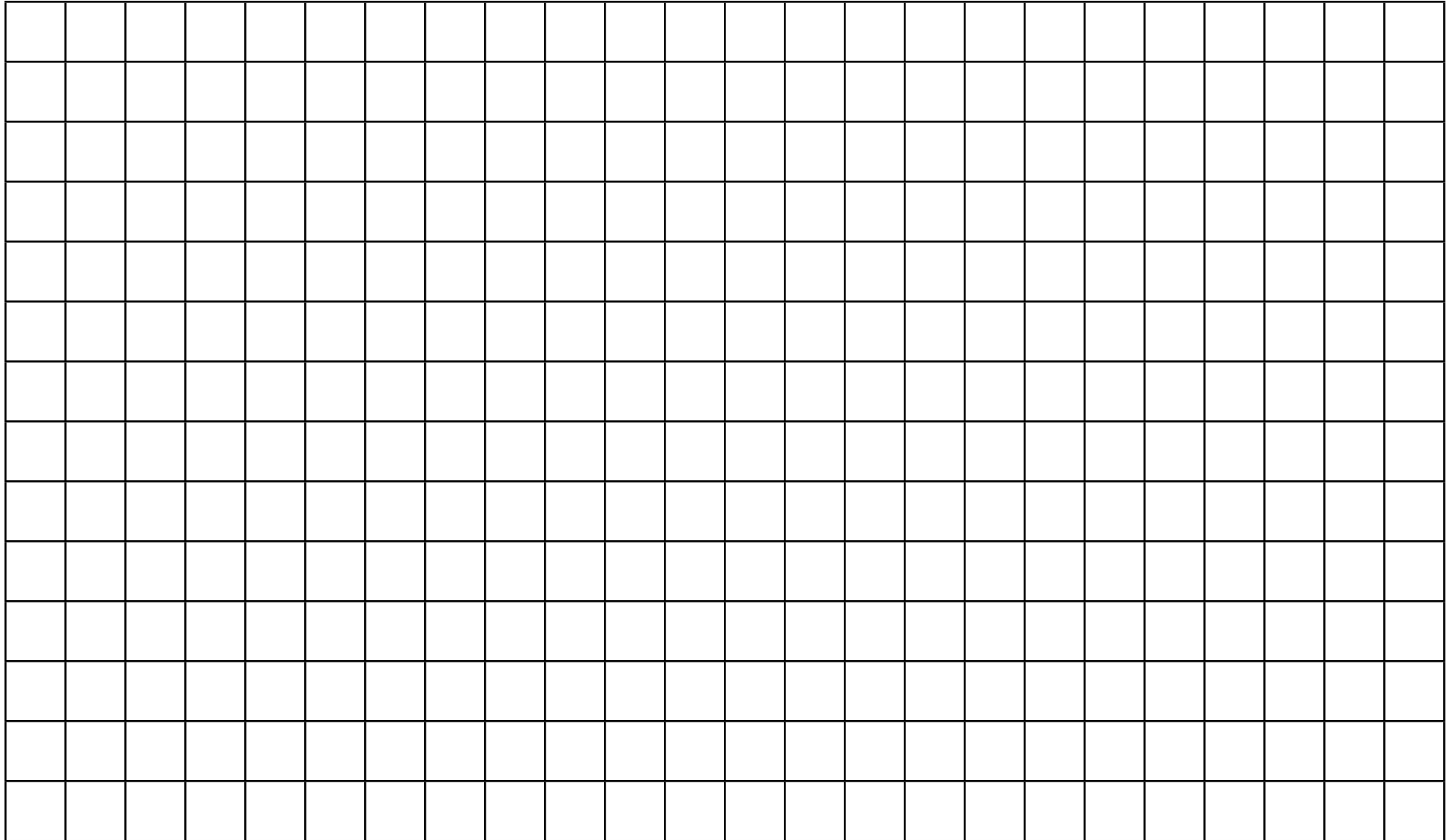
THREE-DIMENSIONAL PIECES

Use this graph paper to create your own three-dimensional furniture for the house.

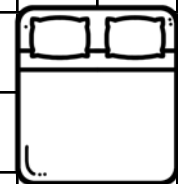
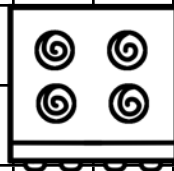
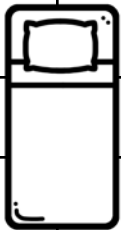
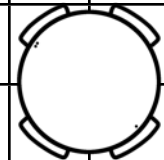
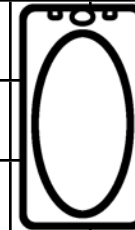
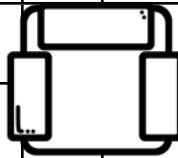
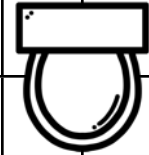
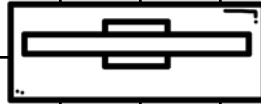
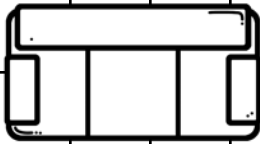


THREE-DIMENSIONAL PIECES

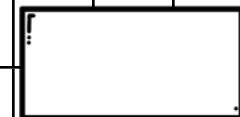
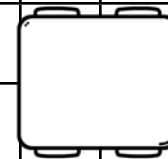
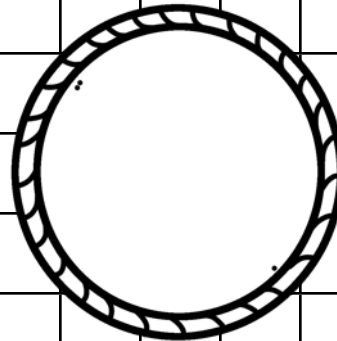
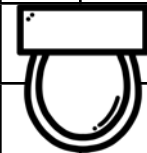
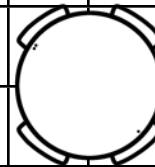
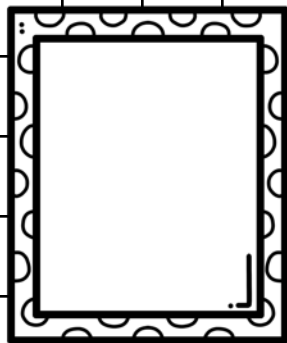
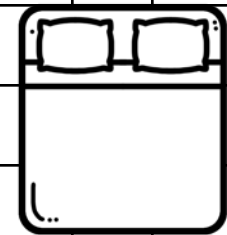
Use this graph paper to create your own three-dimensional furniture for the house.



THREE-DIMENSIONAL PIECES



THREE-DIMENSIONAL PIECES



HOUSING PROBLEMS

The following pages include HOUSING PROBLEMS worksheets.
There are four different versions included for you to choose from.

HOUSING PROBLEMS

Create area or perimeter word problems based on the items in your house. Then give your problems to another student for them to solve.

1.

SOLVE

2.

SOLVE

HOUSING PROBLEMS

Create area or perimeter word problems based on the items in your house. Then give your problems to another student for them to solve.

3.

4.

SOLVE

SOLVE

HOUSING PROBLEMS

Create area or perimeter word problems based on the items in your house.
Then give your problems to another student for them to solve.

1.

SOLVE

2.

SOLVE

3.

SOLVE

4.

SOLVE

HOUSING PROBLEMS

Create area or perimeter word problems based on the items in your house.
Then give your problems to another student for them to solve.

1.

2.

3.

SOLVE

SOLVE

SOLVE

SPEC HOMES

The following pages include different variations of the SPEC HOME.

One version has included all requirements on a single page.

One version has removed the SHAPE column.

SPEC HOME

Find the AREA and PERIMETER of each REQUIRED item in your house.
Fill in the information below.

| ITEM | PERIMETER | AREA |
|------------------------|-----------|------|
| shower or tub | | |
| bathroom sink | | |
| toilet | | |
| bed | | |
| table | | |
| chair | | |
| closet | | |
| desk or side table | | |
| couch/sofa or recliner | | |
| counter | | |
| microwave | | |

| ITEM | PERIMETER | AREA |
|-----------------|-----------|------|
| stove/oven | | |
| kitchen sink | | |
| TV or computer | | |
| refrigerator | | |
| front door | | |
| window | | |
| window | | |
| light | | |
| light | | |
| picture/artwork | | |
| mirror | | |

SPEC HOME

Find the AREA and PERIMETER of each REQUIRED item in your house.
Fill in the information below.

| ITEM | PERIMETER | AREA |
|------------------------|-----------|------|
| shower or tub | | |
| bathroom sink | | |
| toilet | | |
| bed | | |
| table | | |
| chair | | |
| closet | | |
| desk or side table | | |
| couch/sofa or recliner | | |
| counter | | |
| microwave | | |

SPEC HOME

Find the AREA and PERIMETER of each REQUIRED item in your house.
Fill in the information below.

| ITEM | PERIMETER | AREA |
|-----------------|-----------|------|
| stove/oven | | |
| kitchen sink | | |
| TV or computer | | |
| refrigerator | | |
| front door | | |
| window | | |
| window | | |
| light | | |
| light | | |
| picture/artwork | | |
| mirror | | |

SPEC HOME

Find the AREA and PERIMETER of each REQUIRED item in your house.

Fill in the information below.

| ITEM | PERIMETER | AREA |
|-----------------|-----------|------|
| stove/oven | | |
| kitchen sink | | |
| TV or computer | | |
| refrigerator | | |
| front door | | |
| window | | |
| window | | |
| light | | |
| light | | |
| picture/artwork | | |
| mirror | | |

EXTRA PIECES

The following pages include extra and alternative pages you may want to use with your class.

PAGE : 3D BASE

If your students want to create a base that stands up, use this. All sizes are still the same, but the ends can be folded down to create a lid-top.

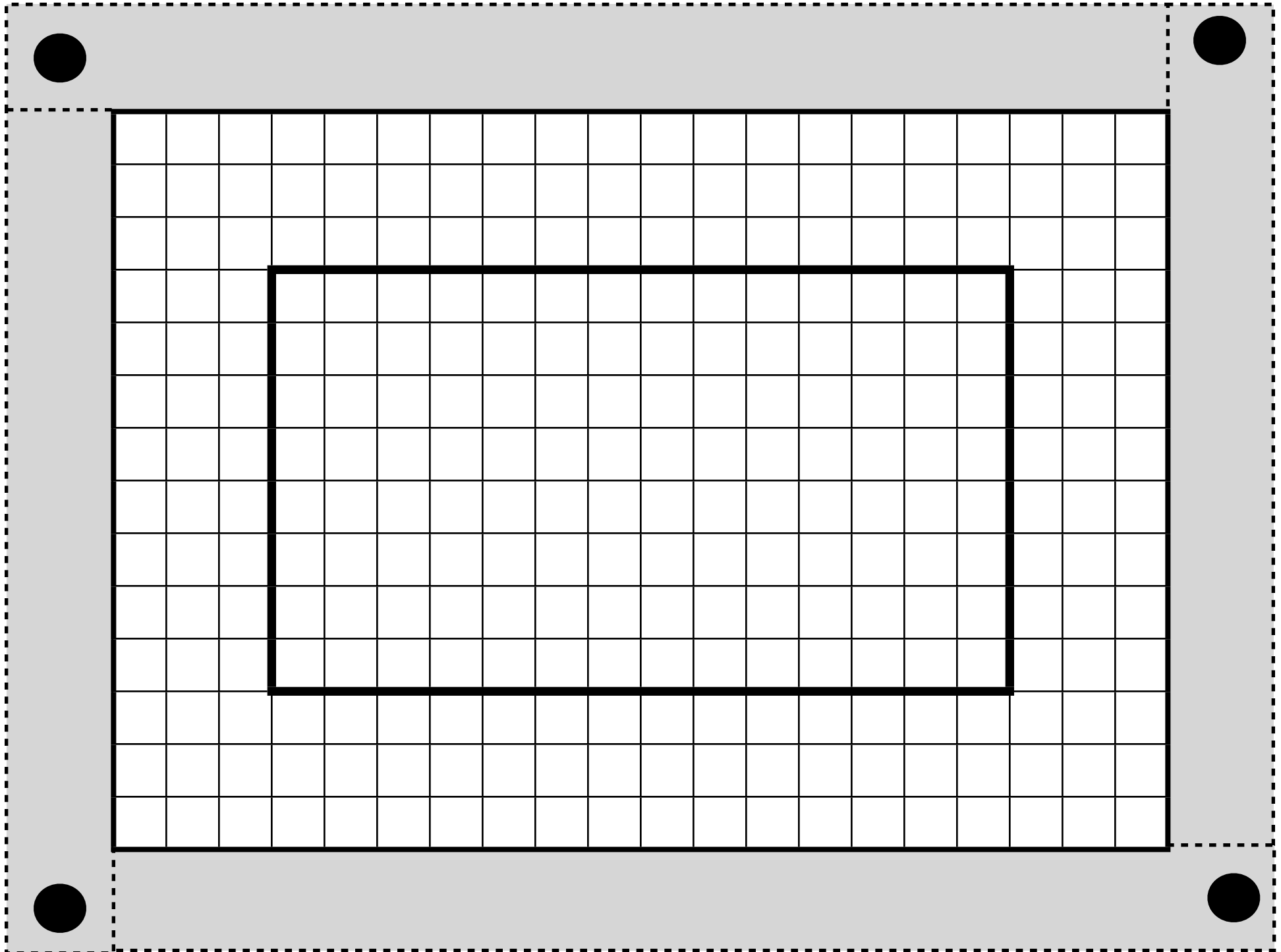
PAGE : LARGER ROUGHER DRAFT GRID

This can replace the smaller one in the packet. It does not include all items from the Requirements List.

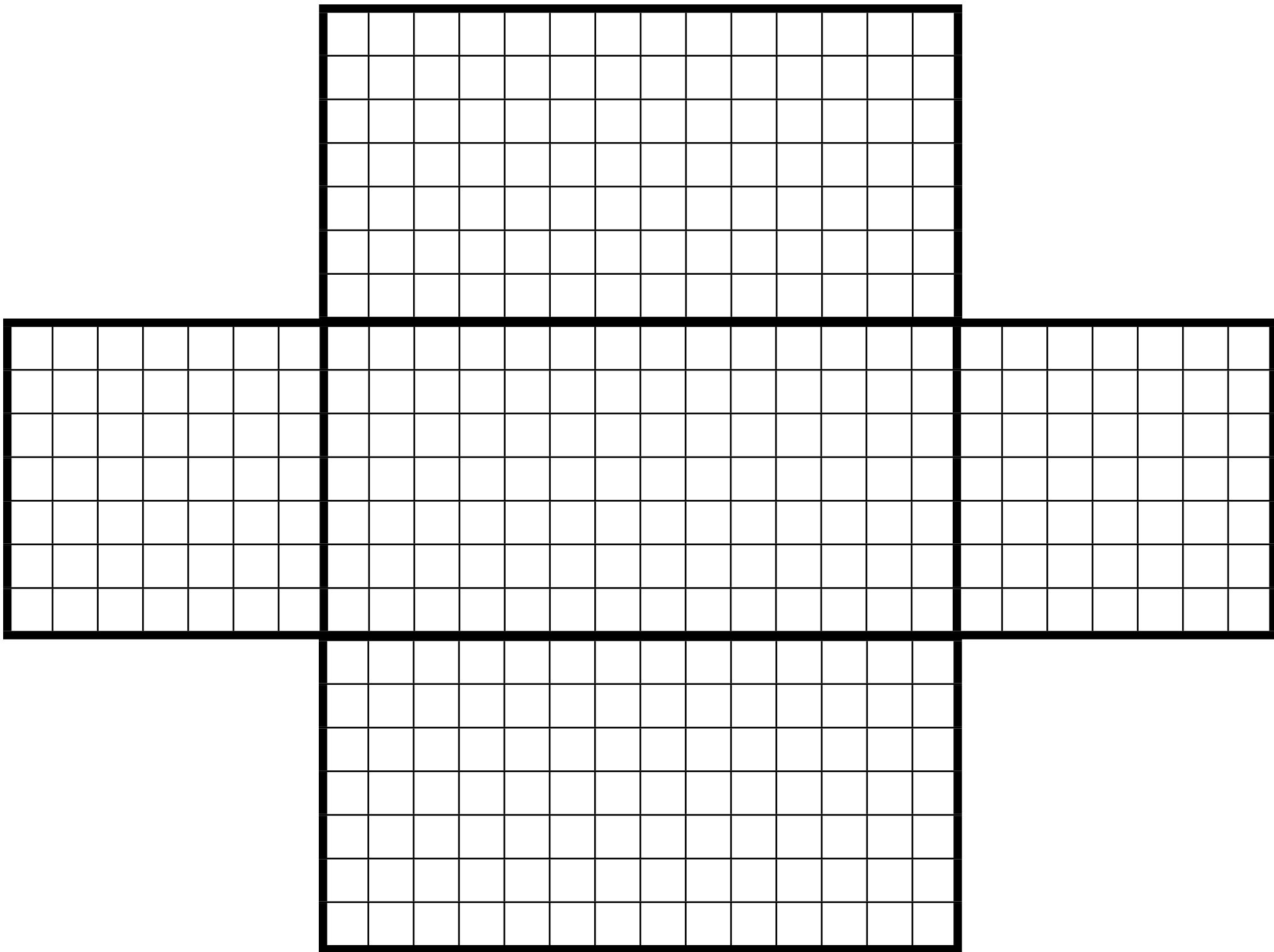
PAGE : FLOOR PLAN LAYOUT EXAMPLE.

Include or project this image to give students a sense of what the house might look like. It doesn't include all parts.

USE THIS IF YOU WOULD LIKE TO CREATE A 3D BASE FOR YOUR HOME.

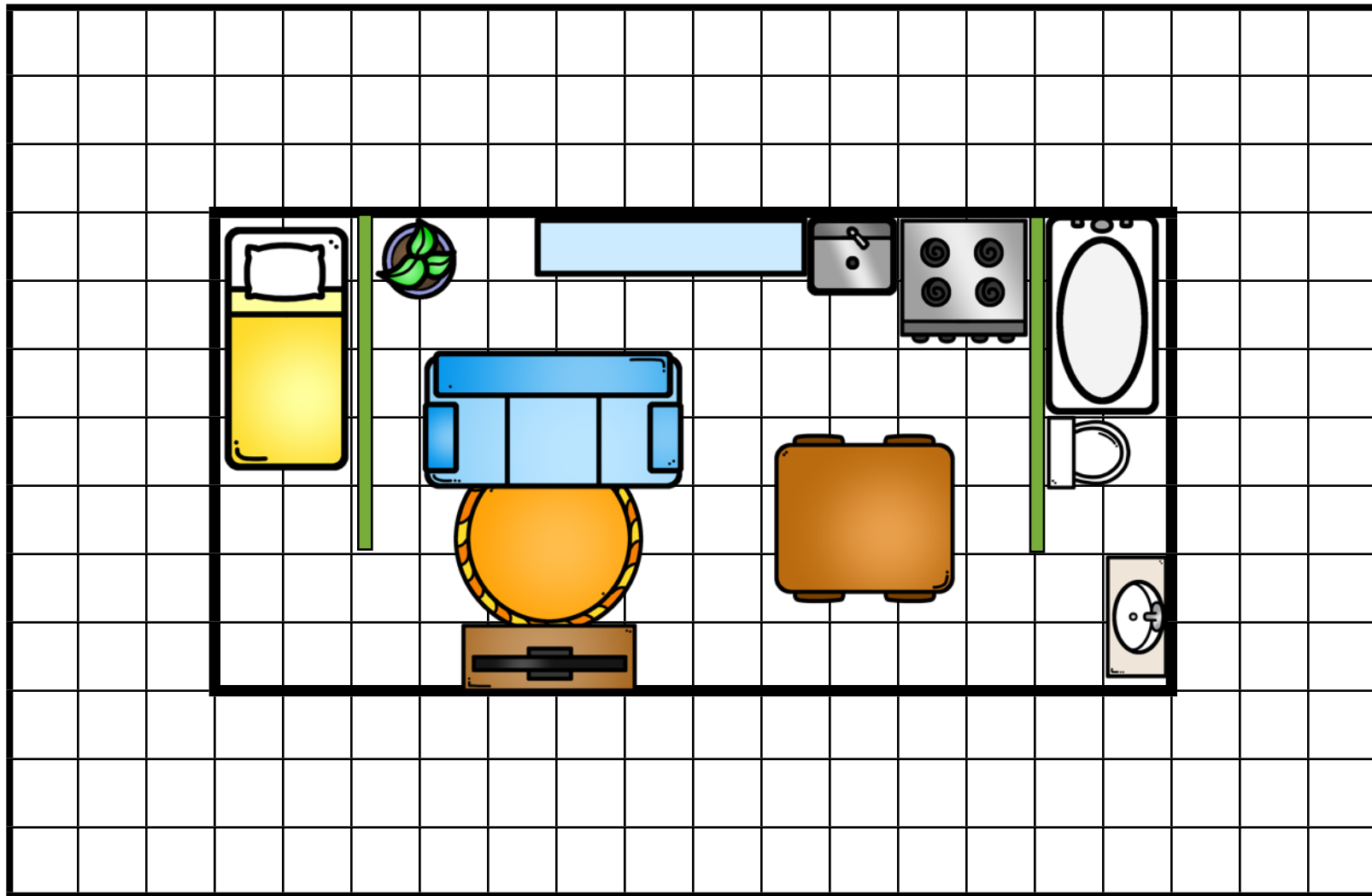


CUT ON DASHED LINE. FOLD DOWN ON BOLD LINE. GLUE EDGES WITH CIRCLES ON THE FOLD NEXT



BASE & FLOOR PLAN

EXAMPLE



TEACHER RUBRICS

Included are two versions of rubrics.
Choose the version that works best for your class.

The first is a **single-point rubric**. If students are proficient in each category (running down the middle) you can circle the criteria. If they exceed or need more work with each criteria, there is space for you to give a specific example. This version requires more writing (from the teacher), but works well if your school is not using traditional grading systems.

The second rubric is more **traditional using a 5-point scale**. Teachers determine the scoring based on how they performed with the project, which is totaled at 25 points. The two final criteria options are based on problem-solving and collaboration. Those do not have a score. Students either exceed, meet, or need more work. Extra space is provided to write in, too.

SCORING RUBRIC

STUDENT NAME: _____

| AREA NEEDS MORE WORK | PROFICIENT | EVIDENCE OF EXCEEDING STANDARD |
|----------------------|--|--------------------------------|
| | Student completed steps 1-8 on the To-Do List | |
| | Demonstrates an understanding of finding area and applying it correctly. | |
| | Demonstrated an understanding of finding perimeter and applying it correctly. | |
| | Demonstrated an understanding of identifying geometric shapes correctly. | |
| | Connected the concepts of area, perimeter, and geometric shapes to real-world settings (building a house). | |
| | Applied problem-solving skills to complete the activity. | |
| | Applied collaboration skills to complete the activity | |

SCORING RUBRIC

STUDENT NAME: _____

| CRITERIA | MET STANDARD | | | | AREA NEEDS MORE WORK |
|---|-----------------------|---|-----|---|----------------------|
| Student completes steps 1-8 on the To-Do List | 5 | 4 | 3 | 2 | 1 |
| Demonstrates an understanding of finding area and applying it correctly. | 5 | 4 | 3 | 2 | 1 |
| Demonstrates an understanding of finding perimeter and applying it correctly. | 5 | 4 | 3 | 2 | 1 |
| Demonstrates an understanding of identifying geometric shapes correctly. | 5 | 4 | 3 | 2 | 1 |
| Connects the concepts of area, perimeter, and geometric shapes to real-world settings (building a house). | 5 | 4 | 3 | 2 | 1 |
| Applies problem-solving skills to complete the activity. | EVIDENCE OF EXCEEDING | | MET | | |
| Applies collaboration skills to complete the activity | EVIDENCE OF EXCEEDING | | MET | | |

MAKING A TINY HOUSE

ROOF



WALL



WALL

BASE



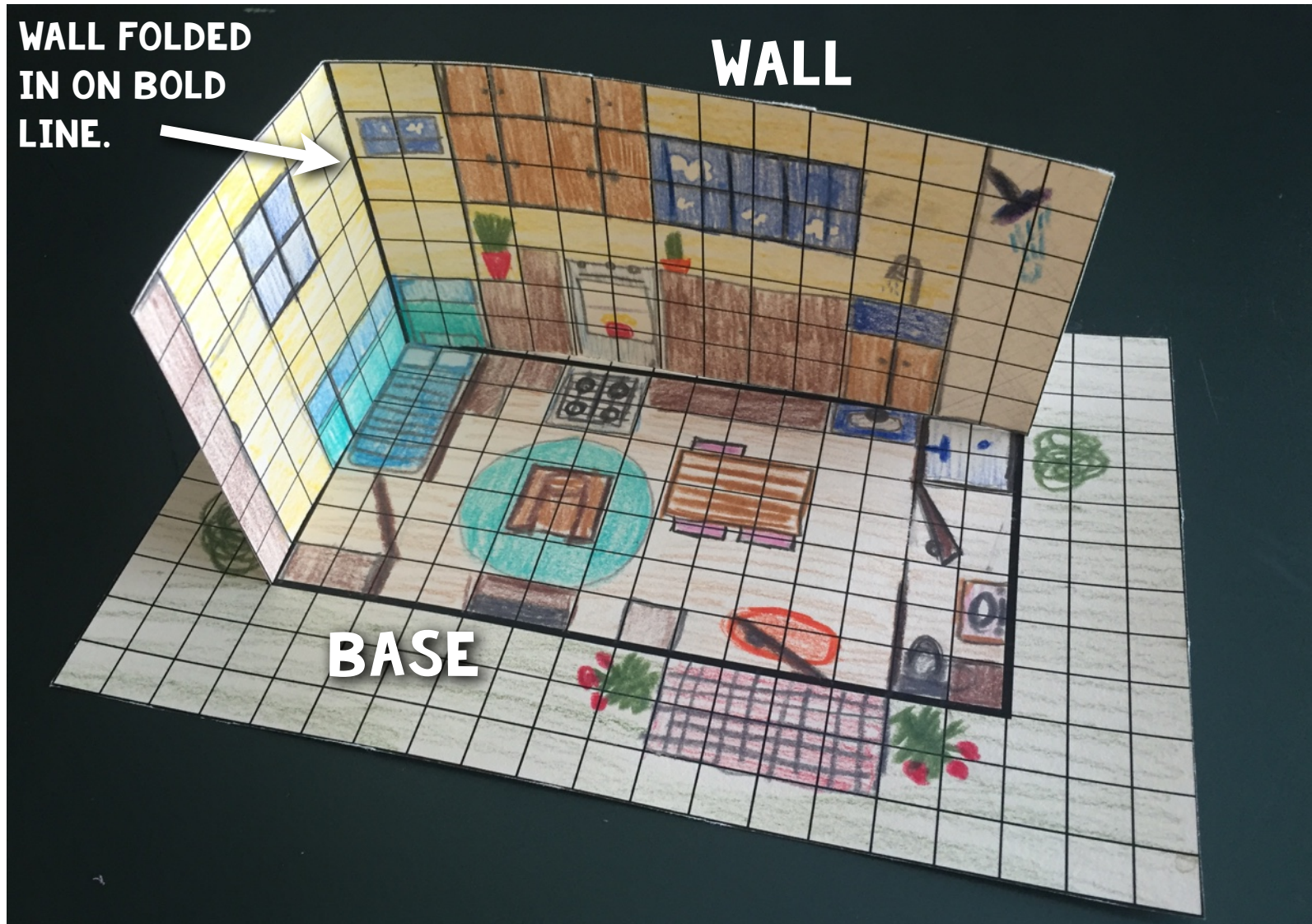
Cut out each of the FOUR major parts once you have fully finished designing them.

MAKING A TINY HOUSE



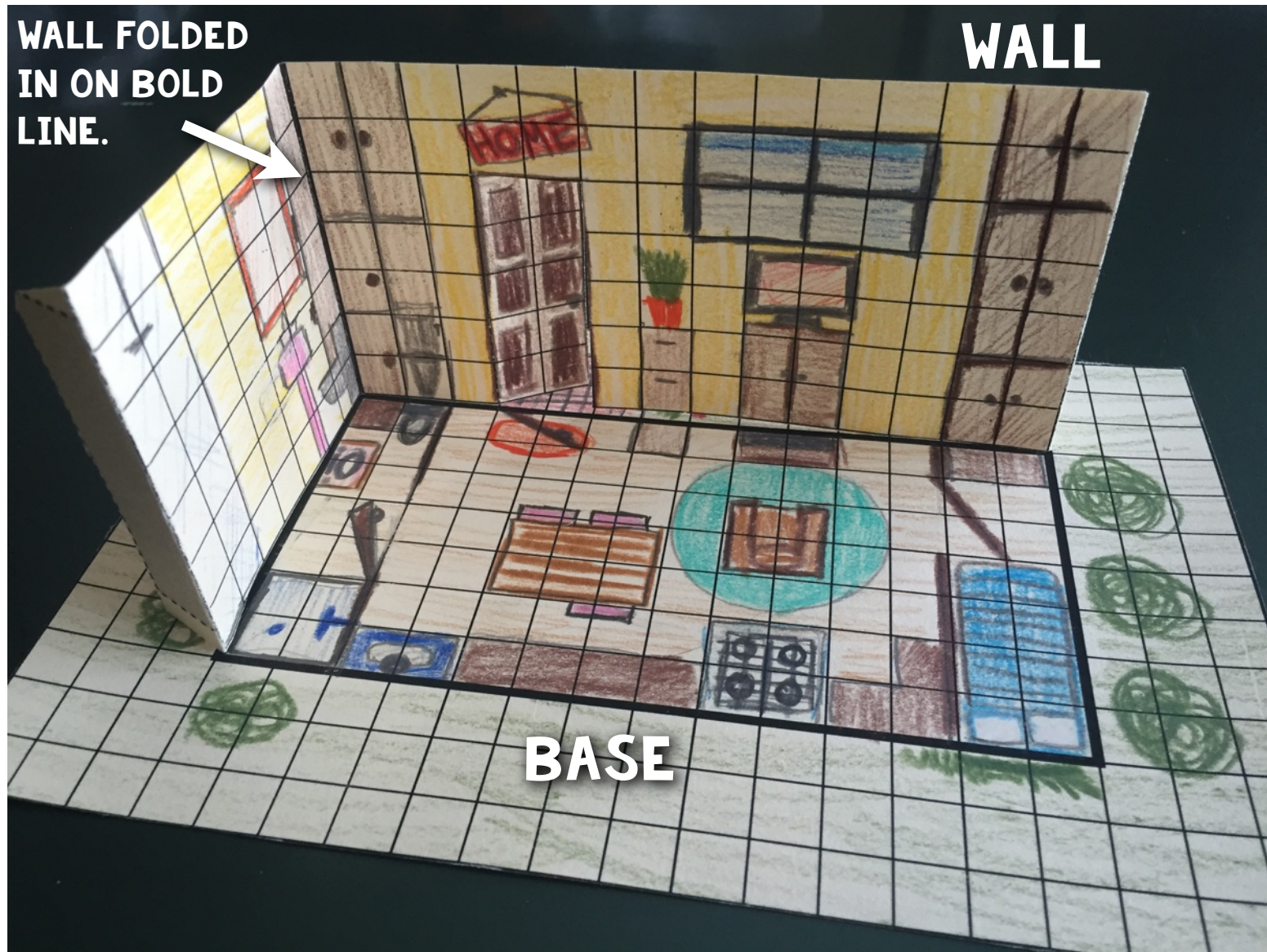
Make sure all the pieces line up with each other.
You won't need to add the roof until the end.

MAKING A TINY HOUSE



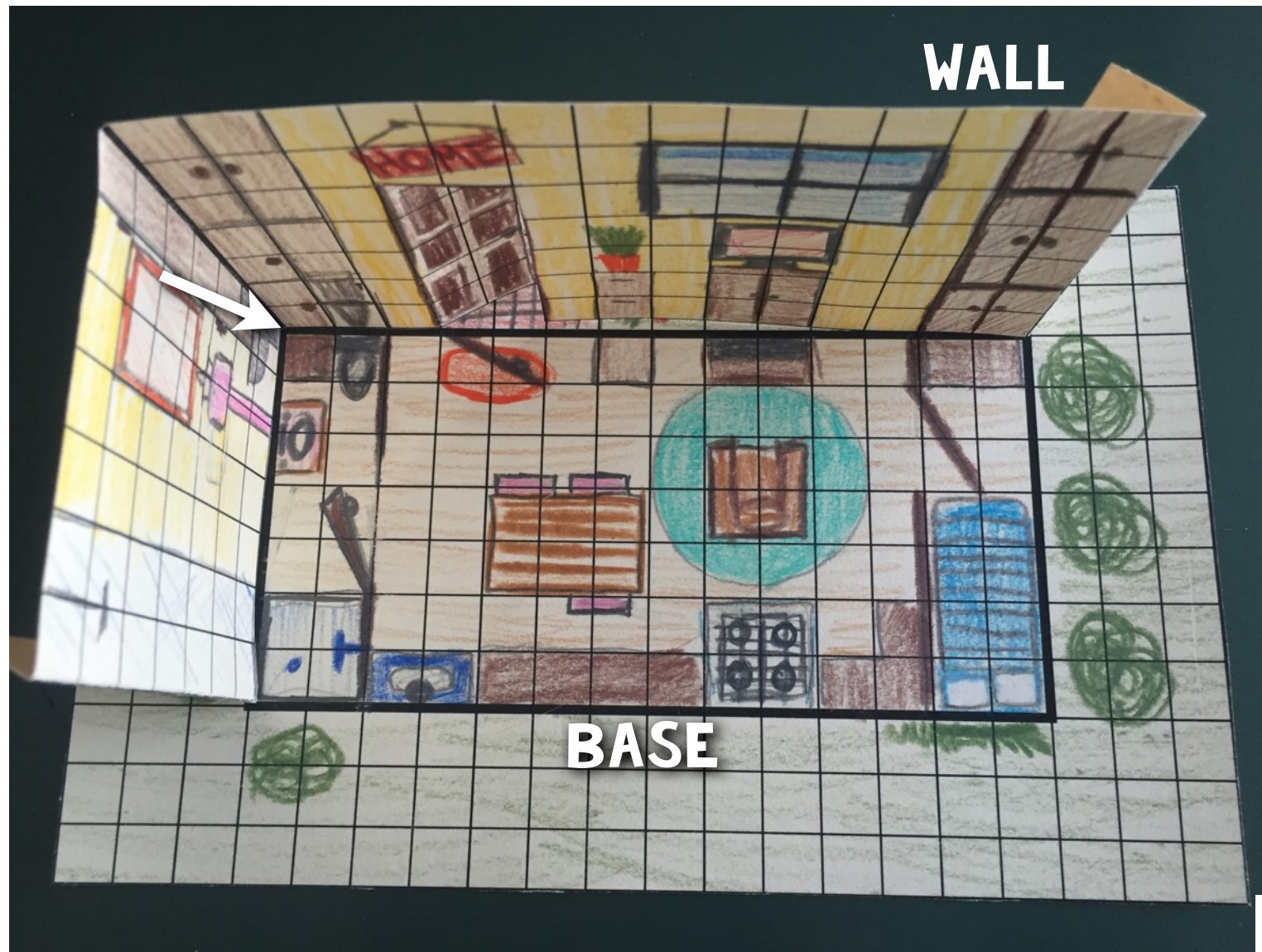
Make sure all the pieces line up with each other.
You won't need to add the roof until the end.

MAKING A TINY HOUSE



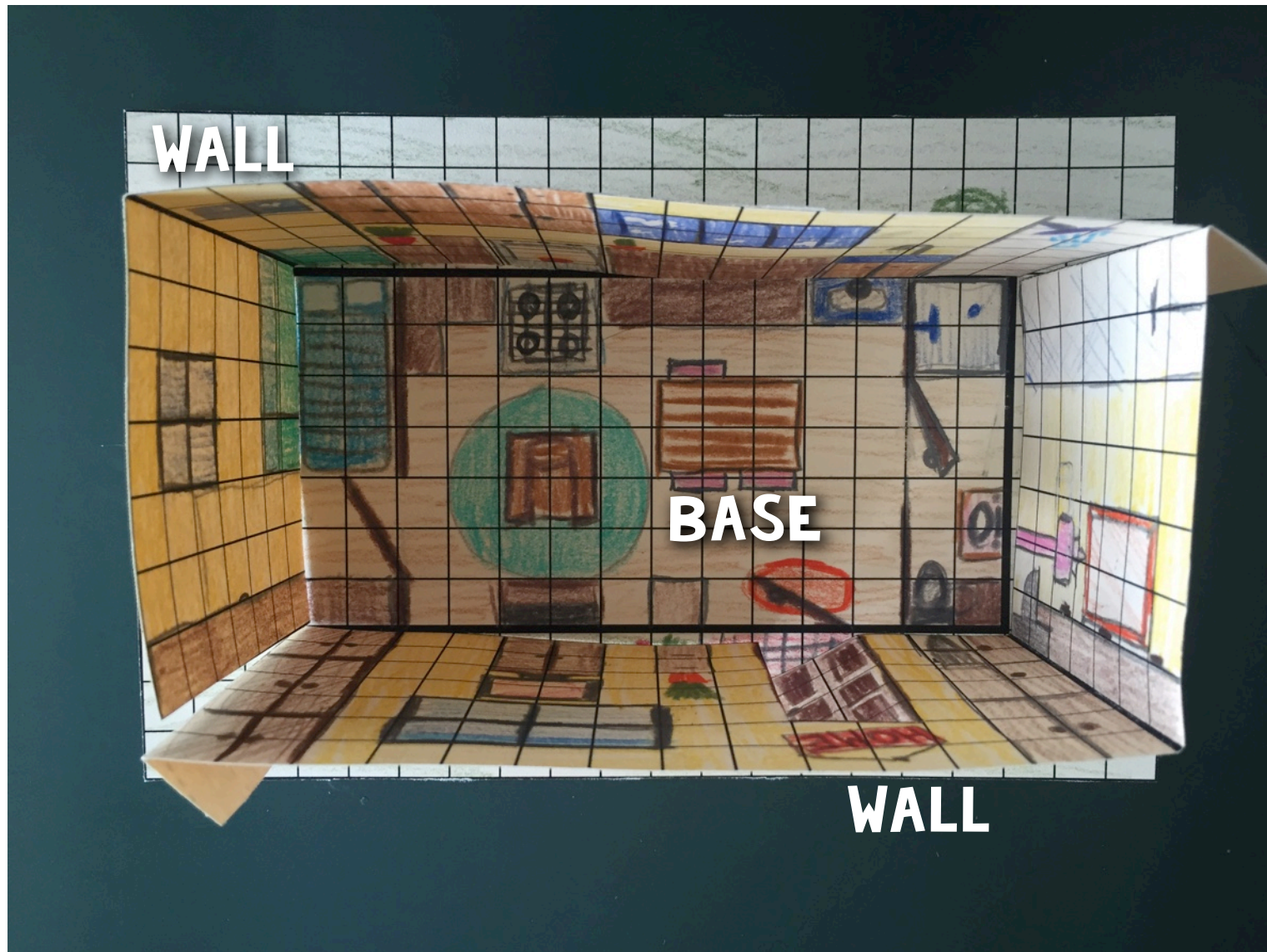
This is the same house, but opposite wall side is shown.

MAKING A TINY HOUSE



There is no need to tape or glue the wall down.
They should stand on their own once the paper is folded.

MAKING A TINY HOUSE



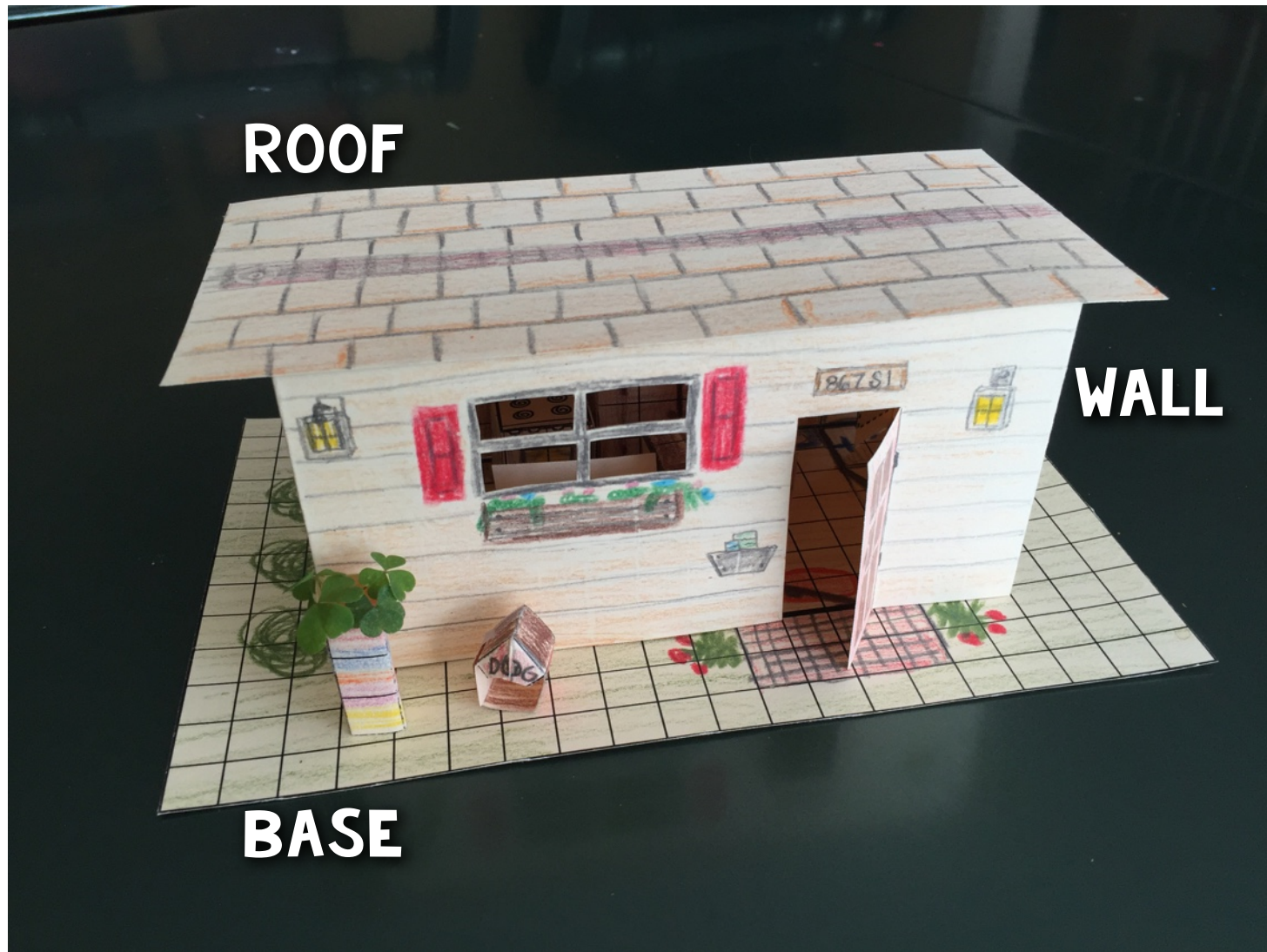
Overhead view of the house pieces placed together.

MAKING A TINY HOUSE



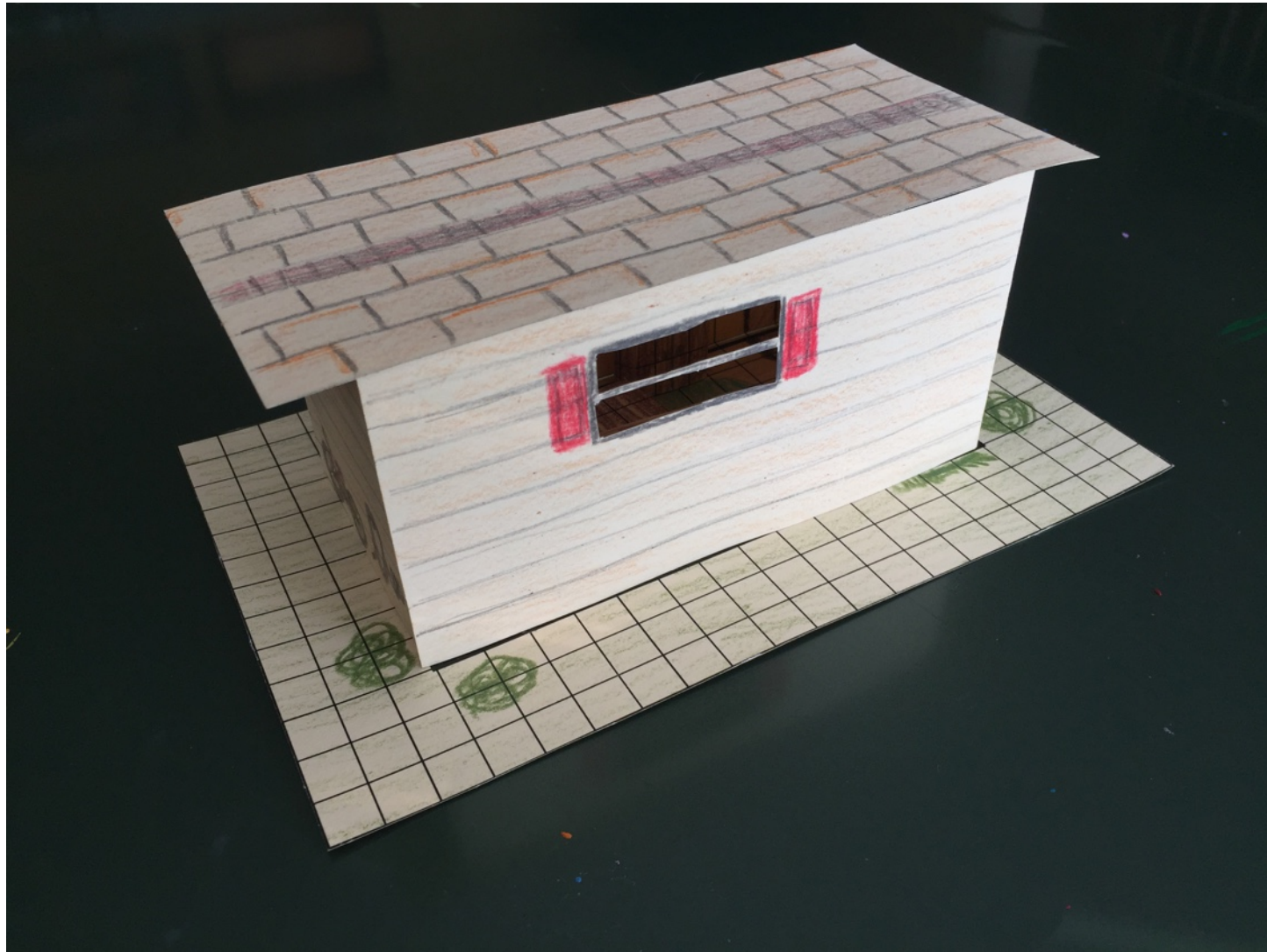
Roof/ceiling added to the top.

MAKING A TINY HOUSE



Designing the outside of the house brings the entire project together.
Crayons and colored pencils are your best choices!

MAKING A TINY HOUSE



A view from the back of the house.

MAKING A TINY HOUSE



Make sure you furnish your house with 3D objects.
There are cutouts included, but you can create many on your own.
It takes practice and patience, but your ideas are unlimited.

Mail box, bunk beds, flag pole, chimney, A/C, fence, walls, stool, washer/dryer, holiday lights hanging off the house....so many ideas!

MAKING A TINY HOUSE

Place your 3D furnishing in the house. You can remove walls to see how it looks.



You will begin to see how much space they take up. This gives you a better idea of how important it is to be a designer.



MAKING A TINY HOUSE



Take a peek inside your house once you have cut out all the windows.



GO AND BUILD YOUR TINY HOUSE!



TPT

IF YOU'RE LOOKING FOR SOMETHING TO ENGAGE STUDENTS, EXPAND THEIR THINKING, AND PUSH CREATIVITY-- CHECK OUT MY ASSORTMENT OF...

Project Based Learning Activities.

CLICK ABOVE!





Click on any image for a direct link.

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Email: digitaldivideconquer@gmail.com.

CREDITS

