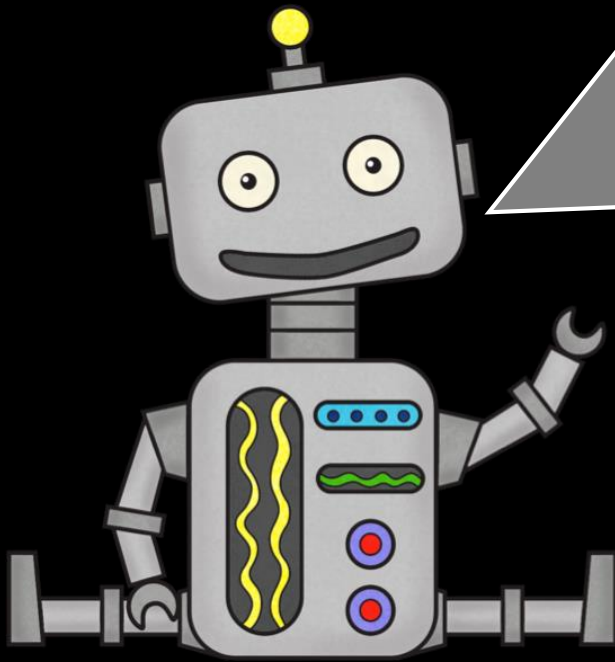


CALCULATE.

CLICK.

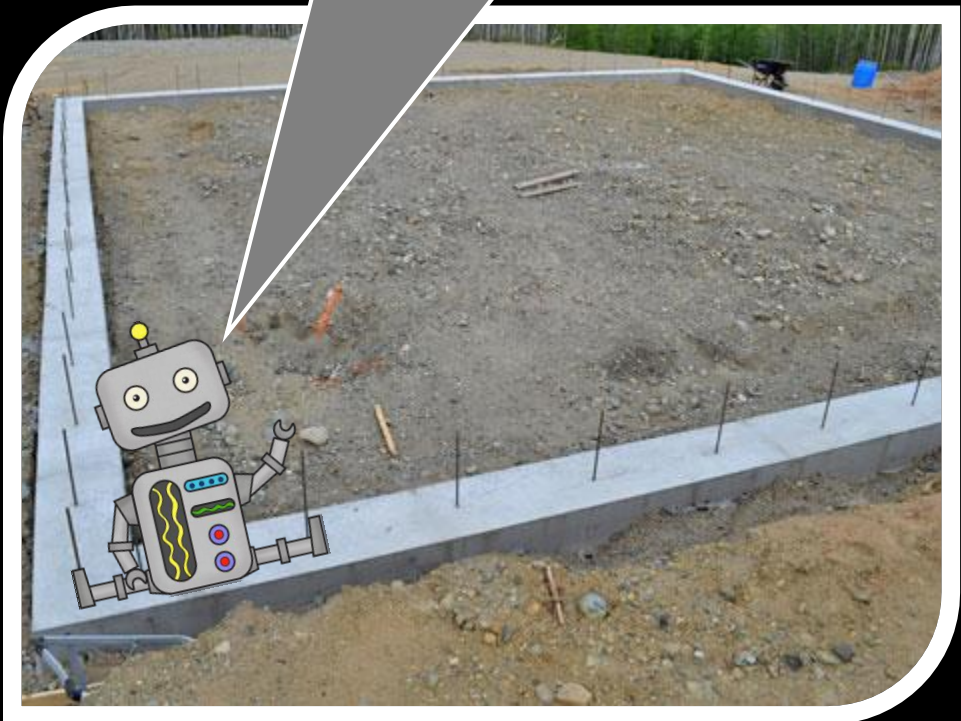
CASA.



Hi! I'm Carlos and just like you guys, I have been working on a Triple Bottom Line Company in Colombia. My company is going to use the open source technology created by Plastic Bank to provide homes for impoverished families. Like Plastic Bank, local people will collect plastic waste from surrounding riverbeds and coast lines and turn them in at our recycling centers. This plastic will be recycled into cartridges for a giant 3D printers. Participants in the recycling program will be able to "print" a small home made of recycled material on the giant printer. My company is called **Calculate. Click. Casa.**

But I need your help! Help us calculate the dimensions for various parts of the house so that we can print these homes! We have already collected thousands of pounds of plastic to convert to printer cartridges. Now we just need to program the printer with the correct dimensions.

First, we have to print footers to make the house nice and sturdy. Footers go *around* the base of the house.



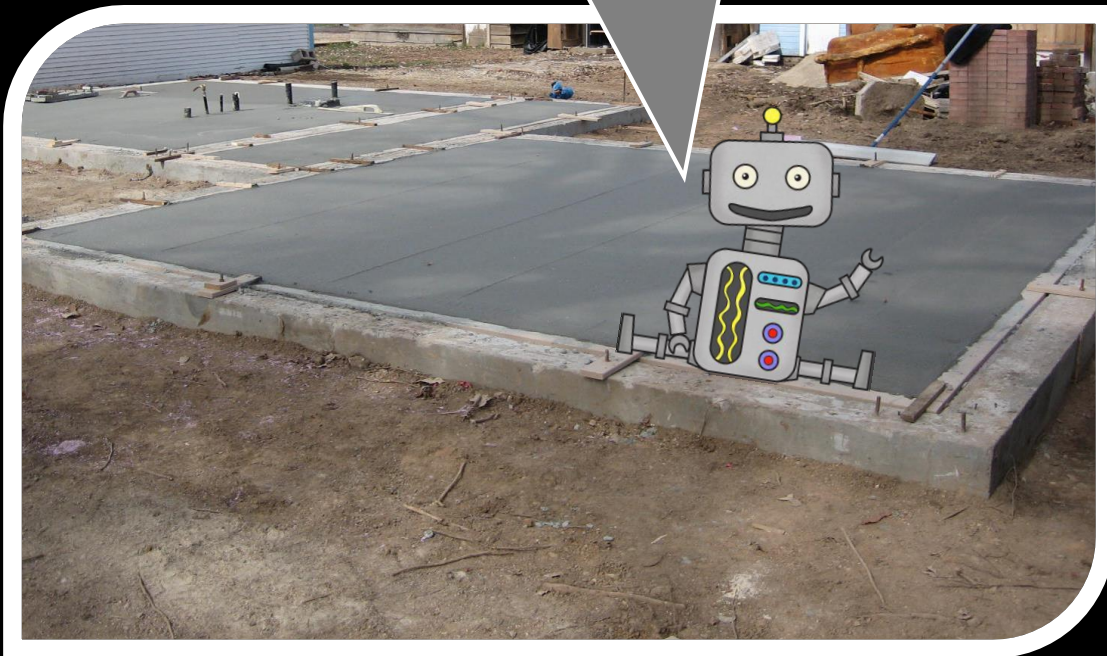
To find the distance around the house, are we calculating the area or the perimeter?

How do you know?

If the house is going to be 30 feet long and 25 feet wide, how many feet of footer will we need?

How do you know?

Next, we will print the foundation of the house.
This *fills in* the space within the footers.



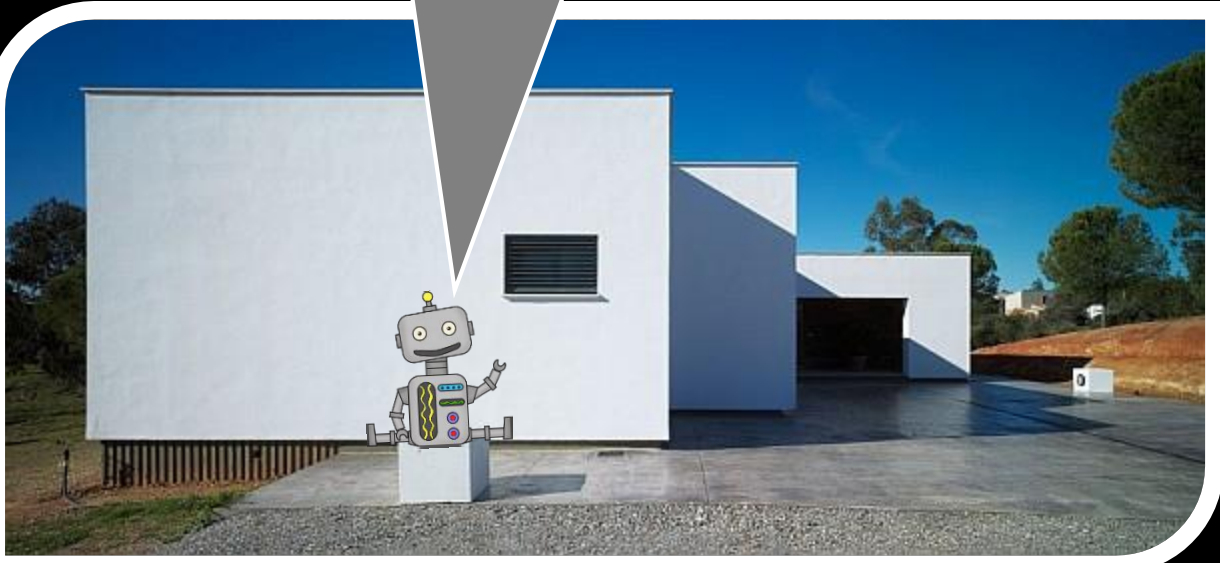
To find the space inside the footers, are we calculating the area or the perimeter?

How do you know?

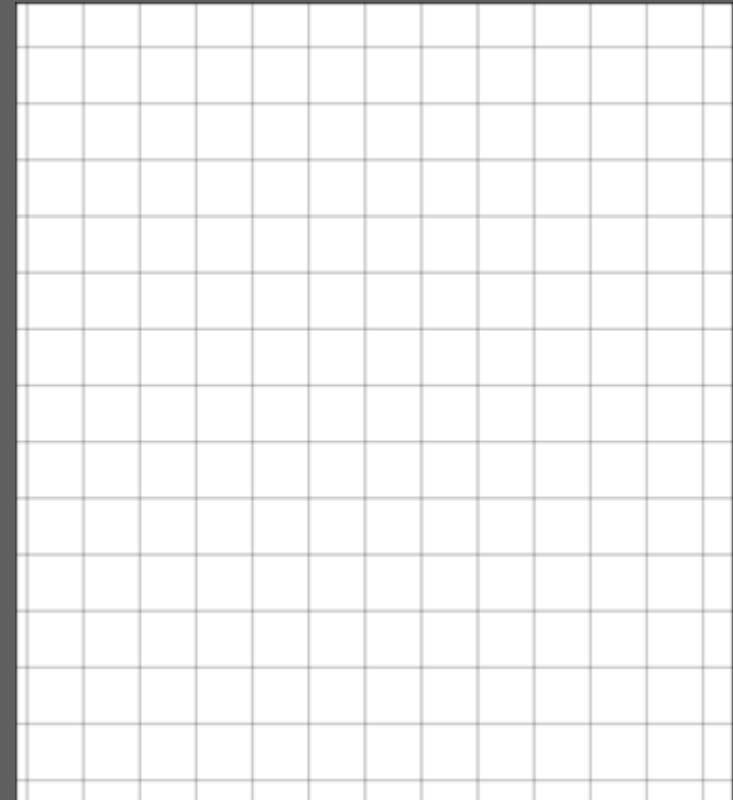
If the house is going to be 30 feet long and 25 feet wide, how many square feet of foundation will we need?

How do you know?

Now its time to build the exterior walls. This wall is 6 yards wide and 4 yards tall.

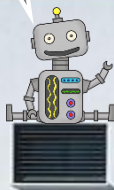


On the grid, draw a rectangle that represents the wall Carlos described.



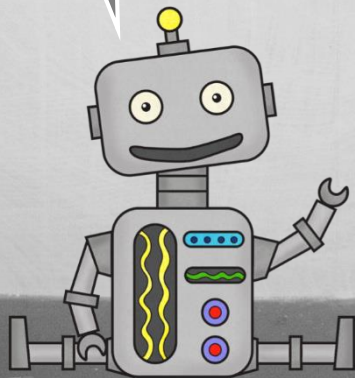
What is the area of this wall?

This window is 2 yards wide and 1 yard tall. It will *not* be made of recycled plastic.



How many square yards of recycled plastic will we need in order to make this wall? Write the steps you would use to solve this problem.

Our 3D printer prints out sheets that are 4 yards tall. If we need an interior wall with an area of 24 square yards, what will the length of the wall be?



Write a fact family of equations that can be used to solve this problem. Use l to represent the unknown length in your equations.

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} \div \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} \div \underline{\quad} = \underline{\quad}$$

Write the answer to Carlos' question as an equation.

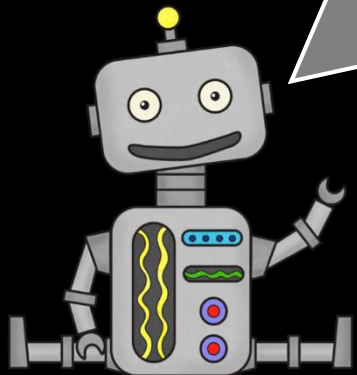
$$l = \underline{\quad}$$

Answer Carlos' question in a complete sentence.

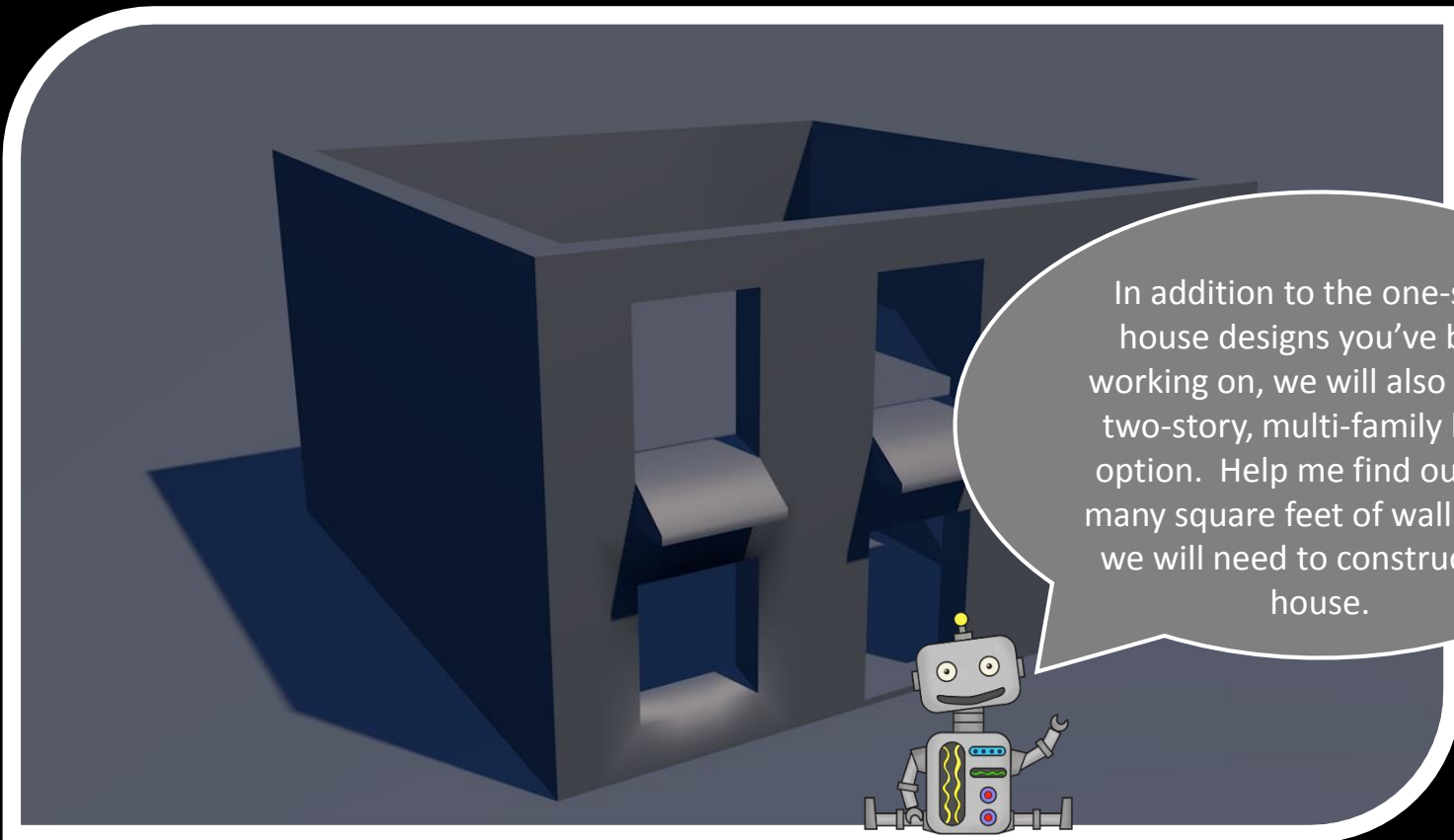
CONGRATULATIONS

You have completed all of the dimensions necessary to provide a home for a local family!

Next, go to Study Island and do the Area Check-Up on your own to show what you know!



COMPUTE CLICK CASA CHALLENGE



In addition to the one-story house designs you've been working on, we will also have a two-story, multi-family home option. Help me find out how many square feet of wall plastic we will need to construct this house.

On the following page...

Fill in the missing information in the chart.

You may use a calculator but should write it out also.

Draw pictures to help you visualize how to solve.

Use STEM Talk!

| | Length of One Wall | Width of One Wall | Area of One Wall | Area of Both Walls | Length of One Window | Width of One Window | Area of One Window | Number of Windows on Each Wall | Area of Plastic Needed for Walls (Without Windows) |
|------------------------|--------------------|-------------------|------------------|--------------------|----------------------|---------------------|--------------------|--------------------------------|--|
| Walls 1 & 2 | 24 ft. | 20 ft. | | | 4 ft. | 3 ft. | | 4 | |
| Walls 3 & 4 | | 20 ft. | 320 ft. | | 6 ft. | | 12 sq. ft. | 2 | |

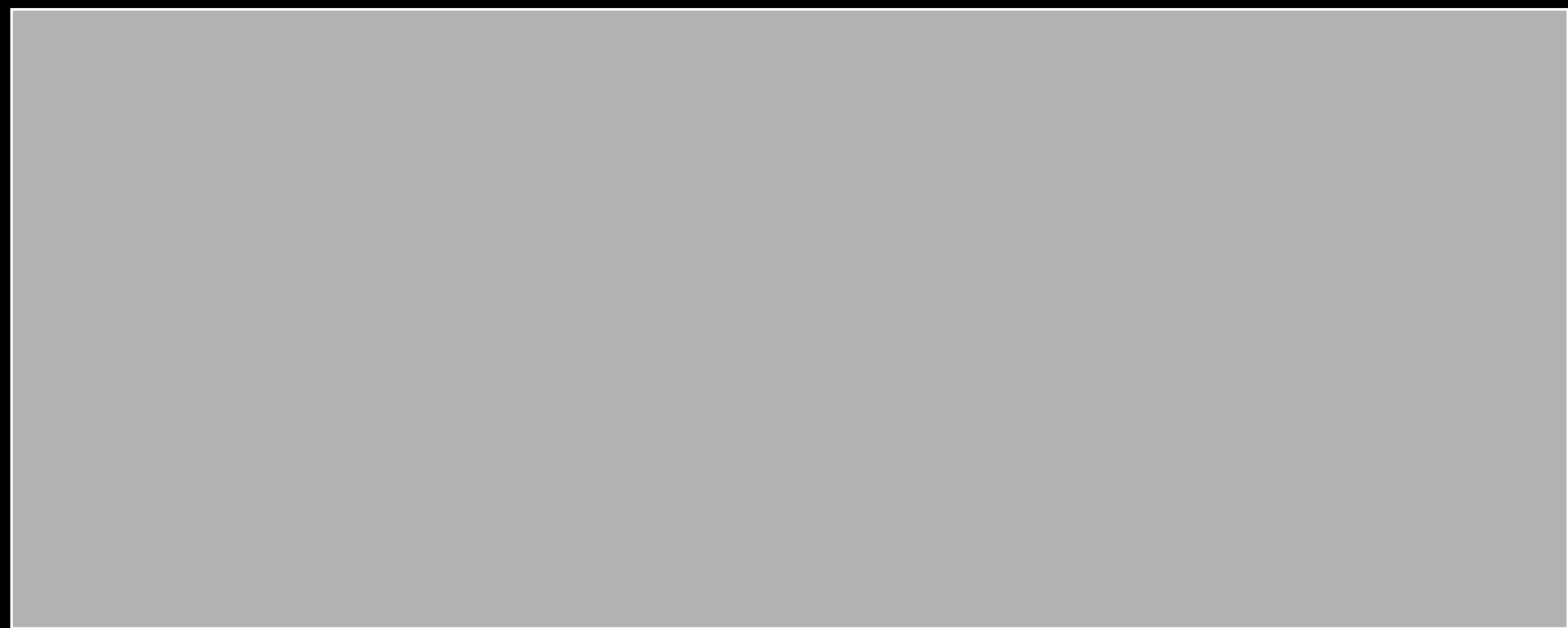


Photo Sources:

- 3D Printed House: <http://www.businessinsider.com/3d-printer-builds-house-in-24-hours-2014-1>
- Robot: <http://www.clipartpanda.com/categories/robotics-clipart>
- Footers: <http://ana-white.com/2011/08/momplex/starting-walls>
- Foundations: <http://revandy.org/2011/09/>
- Exterior Wall: www.decoist.com
- Grid Paper: www.mycutegraphics.com
- White Wall: www.martin-lewis.org
- House without Roof: www.develteam.com
- Printed House: theunboundedspirit.com