



# Habitat Engineering Design Challenge

**Research Objective:** Environmental Factors and Variables

## Description

In this engineering design challenge, you'll become an insect habitat engineer! First, choose an insect and research or brainstorm what it needs to survive, such as food, water, shelter, and space. You'll create a blueprint of your ideal habitat, labeling each feature and explaining how it helps your insect survive.

Next, you'll bring your blueprint to life by building a prototype of your habitat using air-dry clay and natural materials. Think like an engineer as you turn your ideas into a model designed to meet the needs of pollinators and other beneficial insects. When you're finished, take your prototype home and use it to create a small habitat for insects in your community!

## Procedures

1. Choose an insect and design its ideal habitat. Draw your habitat from a top-down view and label important features such as food, water, shelter, and space. Think about what your insect needs to survive and how you can include those needs in your design.
2. Look at the blueprint you created. Think about the features you want to include in your prototype, such as tunnels, shelter, sticks, or leaves. Your prototype should bring your blueprint to life!
3. Start by rolling your air-dry clay into a small ball. Work the clay in your hands to warm it up and make it easier to shape.
4. Shape your ball of clay into a cube. Make sure your cube is large enough for small insects to enter and use as shelter.
5. Use wooden skewers to carefully make tunnels and holes in your clay. Try making tunnels of different sizes to create spaces for different insects.
6. Add the sticks and leaves you collected outside. Think about your blueprint as you decide where to place each material.
7. Compare your prototype to your blueprint. Does your prototype include the features you designed? How will each feature help your insect survive?
8. Place your finished prototype on the drying rack. A sheet of plastic can be placed over it while it dries to help prevent cracks.
9. Your prototype may take up to 24 hours to fully dry. Once it is ready, you can take it home and use it to create a small habitat for insects in your community!

## Materials

- Air-dry Clay
- Drying racks
- Sheets of plastic
- Paper towels & Clorox wipes
- Wooden skewers
- Sticks and leaves

## Tips

- Think like an insect! Ask yourself: Where would my insect find food, water, shelter, and space?
- Use your blueprint as a guide! As you build, look back at your blueprint to help decide where to place your tunnels, sticks, leaves, and other features.
- Make different-sized tunnels. Different insects need different sized spaces, so try making some tunnels wide and some narrow.
- It's okay to change your design! Engineers often change their prototypes when they discover something that could work better.



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## Student Investigation

Pick your favorite insect and design the blue-print for their ideal home

A blank 10x10 grid of squares, intended for drawing a 3D object. The grid is composed of 10 columns and 10 rows of squares, with a thicker border around the perimeter.