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# Lesson Plan: Insect Architects - Design and Build a Bug Hotel

## Materials Needed:

- **For Research & Design:**
  - A notebook or sketchbook (to be your "Architect's Field Journal")
  - Pencils, colored pencils, or markers
  - Access to the internet or library books about local insects
- **For Construction (Gather from your yard or craft supplies):**
  - A frame for the hotel (e.g., an old wooden box, a small crate, a large tin can with both ends removed, or several pieces of scrap wood to nail together)
  - Various natural "filler" materials (the rooms for your hotel!):
    - Hollow stems (bamboo, reeds, sunflower stalks)
    - Pinecones and seed pods
    - Small logs or pieces of wood (you will need a drill for these)
    - Rolled-up cardboard or paper straws
    - Dry leaves, twigs, and bark
    - Small terracotta pot pieces
  - Gardening gloves
  - Safety glasses (especially if drilling)
  - (Optional) A drill with various bit sizes to make holes in wood blocks
  - (Optional) Twine or wire to bundle materials

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## Learning Objectives

Hello Victoriafipadair! Today, you're not just a student; you're an architect and an ecologist. By the end of this lesson, you will be able to:

1. **Identify** the habitat needs of at least three different beneficial insects found in our local area (like solitary bees, ladybugs, or lacewings).
2. **Design** a "bug hotel" blueprint that provides suitable "rooms" for your chosen insect guests.
3. **Construct** a sturdy and functional bug hotel using a variety of natural and recycled materials.
4. **Explain** your design choices, connecting them directly to the needs of the insects you want to attract.

## Lesson Activities

### Part 1: The "Client" Research (1 hour)

Every great architect needs to know their client! In our case, the clients are beneficial insects. They help pollinate flowers and protect our gardens from pests.

- **Your Mission:** In your Architect's Field Journal, research at least three different beneficial insects

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that live in your region. Good candidates include Mason Bees, Leafcutter Bees, Ladybugs, Lacewings, and Spiders.
- **Guiding Questions for Your Research:**
  - What does this insect do that is helpful? (Is it a pollinator? A pest-eater?)
  - Where does it like to live or lay its eggs? (In hollow stems? Under bark? In rotting wood?)
  - What size and shape of space does it prefer? (Tiny holes? Cracks and crevices? A cozy bundle of leaves?)
- **Helpful Tip:** Search online for "[Your State/Region] beneficial insects" to get started. University extension websites are excellent resources!

Part 2: The Blueprint (30 minutes)

Now that you know your clients, it's time to design their dream home. A good bug hotel has a variety of "rooms" to attract different guests.

- **Your Mission:** In your journal, sketch a design for your bug hotel. Don't just draw it—label it!
- **Design Checklist:**
  - Did you choose a strong outer frame?
  - How will you divide the inside into different sections or "apartments"?
  - Label which materials will go in each section.
  - Next to each material, write down which insect "client" you are hoping to attract with that room. For example: "*Hollow bamboo stems for Mason Bees.*" or "*Pinecones and twigs for Ladybugs to hibernate.*"

Part 3: Construction Zone (1.5 - 2 hours)

Time to bring your blueprint to life! Put on your gloves and safety glasses—it's time to build.

- **Step 1: Prepare your Frame.** Make sure your box, crate, or frame is sturdy and clean.
- **Step 2: Cut and Prepare your Fillers.** Cut your hollow stems so they are slightly shorter than the depth of your frame. If you're using a wood block, drill holes of various sizes (between 3mm and 10mm is great for bees), making sure not to drill all the way through. The back must be closed.
- **Step 3: Pack the Hotel.** This is the most creative part! Tightly pack your different materials into the sections of your frame according to your design. Make sure everything is snug so it won't fall out. Use twine to bundle sticks or stems together if it helps.
- **Step 4: Choose a Location.** Find a good spot for your hotel. The best place is a sunny, sheltered spot (facing south or southeast is often ideal), about 3-5 feet off the ground. It should be protected from strong winds and rain.

Part 4: The Grand Opening & Observation (Ongoing)

Your hotel is now open for business! The final step is to observe and document who checks in.

- **Your Mission:** Create a new section in your journal called "Hotel Guest Log."
- Once a week, visit your hotel and record your observations.
  - Do you see any activity?
  - Have any of the hollow tubes been plugged with mud or leaves? (This is a great sign that a solitary bee has moved in and laid eggs!)
  - Can you identify any of the visitors?
  - Take sketches or photos of your guests.

Assessment & Wrap-Up

Let's review your amazing work as an Insect Architect!

- **Show and Tell:** Explain your finished bug hotel to a family member. Point out the different "rooms" and explain which insects they are designed for, using the research from your journal.
- **Journal Review:** We will look through your Architect's Field Journal together. The goal is to see your process—from your initial insect research and design sketches to your first entry in the "Hotel Guest Log." Your thoughtful connections between insect needs and your design choices are what matter most!

Extension & Challenge Ideas

- **Create a "Welcome" Sign:** Design a small, weatherproof sign for your hotel that explains its purpose and introduces a few of the potential guests.
- **Plant a Buffet:** Research and plant a small container garden of native flowers near the hotel to provide a food source for your new residents.
- **Biomimicry Challenge:** Pick one insect guest and research one of its amazing abilities (like a bee's navigation or a spider's silk). Brainstorm an invention that mimics that ability to solve a human problem.

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