## Earth Day Engineering Project: Insect Hotels

**Objective**: We can encourage beneficial insects to our yards by making them an insect hotel.

**Difficulty Level:** **Easy (all ages)**

**Materials:**
A large plastic bin or box
Pine needles, Pine cones
Sticks, Bark
2 or 4 bricks
Empty 2 liter bottles
Soil
Paper towels
A trowel or shovel
Scissors
Toilet paper tubes (Or paper towel tubes)
Thin cardboard from cut up boxes
Garden litter -- weeds, greenery
Fruit peels/Vegetable scraps
Assorted cardboard boxes (cereal boxes, shoe boxes, other small cardboard boxes)

**About:**
Entomologists are scientists who study insects. They estimate that there are over 10 quintillion insects crawling, flying, buzzing, and hopping on our planet!

Just in the average back yard or garden, there may be over 2,000 different species of insects. Most of these insects help us by pollinating plants, feeding birds and animals, and helping to clean up rotting plant matter and dead organisms.

## Procedure

1. Find a flat, quiet spot outside that isn't right up next to your house. Good places to make an insect hotel are near bushes, plants, or trees.

Your insect hotel can encourage beneficial insects to populate your garden. Think about what insects might want in their habitat: shade? A nearby water source? Food sources?

2. Lay the bricks down on the ground, about 12 inches apart. Make a solid nest of pine needles in between them. If you can't find bricks, think about what you could use to raise the base of your insect hotel up off the ground.

3. Place the boxes or containers you will use for your insect hotel on top of the foundation of bricks or other items. Try to use a waterproof outer container-- a large plastic storage bin works well. If you want it to look more like part of the environment, think about how you could disguise it with natural materials. Could you cut soda or water bottles, fill them with soil, and hot glue them to the sides, so when the plants bloom they will disguise the box? Think of different ideas you can try.

4. Put shoe boxes, cereal boxes, or other cardboard boxes inside the outer container.

5. Put flower pots or 2 liter bottles cut in half into the boxes.

6. Fill the flower pots or bottles with paper towel tubes or toilet paper tubes. Stack the tubes on top of each other-- you can use a little tape or a drop of glue on each tube to hold them in place, if you need to.

7. Put your organic materials like fruit rinds, grass, or leaf cuttings into the cardboard tubes. Be sure you don't pack the tubes so tight that insects can't get inside.

8. Cover the top of your box with mulch, pine needles, lightweight sticks and bark. You may want to put down a layer of wet soil to hold them in place.

9. Add a layer of pine cones on top of the sticks and bark. This will help keep everything in place.

10. Fill in gaps between the flower pots or bottles with natural materials like lawn cuttings or mulch.

## What Next?

Leave your insect hotel alone for a few days, without disturbing it. You want to give the hotel guests time to settle in.

After a few days, you can start making your observations. Take your science notebook, and go out each day to check on your hotel. Record what time of day you checked, and what the weather was, and whether you saw evidence of insects.

The bark and sticks will attract beetles, who will lay their eggs, which will hatch into grubs. After a few weeks, you may find creatures like fat white worms. Don't bother them-- they are wood beetle grubs. See if you can observe how long it takes them to turn into beetles.

You also may find 'roly polies' (harmless woodlice), eating the bark as it decomposes. You may find centipedes, ants, worms, ladybugs, or even caterpillars.

Ladybugs and worms will be beneficial to your garden, ladybugs eat pests, and worms help compost soil.

Record how many days it took from the time you made your insect hotel until the time the first guests moved in. If you throw some Pollinator Packets (link to activity) near your insect hotel, you may attract even more beneficial guests to your garden ecosystem.

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