



3Doodler<sup>®</sup> EDU

Design Challenge

# The Well-Dressed Bug Bot

**Participant's Guide**

## 🚩 The Challenge

After studying the natural design of insects, create an exoskeleton for your bug bot using the 3Doodler pen and plastic strands.







## Present & Redesign: (⌚ 25 min.)

 Notes

**Step 1:** Pair with another team to show and explain your design ideas. Listen to each other's questions and feedback as you consider how to improve your initial designs.

**Step 2:** Go back to your stations and incorporate any feedback necessary to tweak your design before you begin to build with the 3Doodler.

## Classes 3 & 4: Build, Present & Reflect

⌚ Total Time: 100 min.

### Build (⌚ 80 min.)

**Step 1:** Assemble the main components of the bug bot, which includes all wires, batteries, brushes and motor.

**Step 2:** Test the bug bot to make sure that it vibrates before attaching the other body parts.

**Step 3:** Begin creating the exoskeleton, legs, antennae, wings and eyes.

**Step 4:** Assemble all of the parts together. Make sure that the battery can be easily removed. (This may mean that the exoskeleton can be attached with a clip or using FLEXY strands.) Use the 3Doodler pen to attach the plastic strand components by warming up the metal tip and welding them together.

**Step 5:** Attach any other body parts using an hot glue gun or duct tape.

**Step 6:** Test the bug bot to make sure that it moves once fully assembled.

### Present & Reflect: (⌚ 20 min.)

Now it's time to present your bug bot. Take 5 minutes to prepare your presentation.

Bug Bots will be evaluated on the following criteria:

- Application of your insect investigation on the design of your bug, including how you named your bug and which family of insects has inspired it.
- Description of how the bug's features help with mating, camouflage and communication.
- Demonstration of how your bug bot moves and how your team created the overall design.

## 🔗 More Information:

For further information and inspiration about insect design, visit:

- <http://www.backyardnature.net/bugbody.htm>

For further information and inspiration about insect biomimetrics, visit:

- <http://goo.gl/czzkD0>

For further information and inspiration about insect design, visit:

- <http://goo.gl/TU97hW>

## 🖼️ Images:

Cover Page:

Fig. 1: [https://c1.staticflickr.com/3/2050/1585685158\\_d82b088cac\\_b.jpg](https://c1.staticflickr.com/3/2050/1585685158_d82b088cac_b.jpg)

Fig. 2: <https://goo.gl/ZgwgSO>

Fig. 3: <http://www.redtedart.com/wp-content/uploads/2011/11/mini-robot-materials.jpg>

Fig. 4: <http://www.instructables.com/id/Make-a-very-simple-insect-robot-toy/?ALLSTEPS#intro>