**Build a Bodacious Bug**

  This activity demonstrates an important part of natural selection and adaptation. The idea is that organisms that are best suited to an environment will have more babies. This means that over time their genes will become more common within a species. The species will adapt to its environment both physically and behaviorally. In order to survive in an environment, an animal needs to adapt, to develop traits that fit it to where it lives. If the environment changes, so will the organism, or it may die out.

For example, mountain goats have padded hooves to grip the rocks on which they climb, giraffes are tall to reach the leaves of tall trees, and frogs have long, sticky tongues to catch insects to eat, and are colored brown or green to match their environments so that predators do not notice them. In fact, nearly everything about an animal is an adaptation of one kind or another. Think of a trait that an animal has, and then think of how that trait helps it to survive or reproduce in its environment. Different adaptations are helpful for different environments. For a rabbit living in the Arctic, white fur would be helpful to avoid being seen by predators. For a rabbit living in the woods, being white would make it more conspicuous, but being brown would be helpful.

We have been studying insects. This activity is about creating insects with useful adaptations. The insect’s environment is given and will be picked randomly (as an insect cannot choose the environment it is born into). You will develop an imaginary insect that could survive in that environment.

**Materials:**

One 8-sided die

Blank paper (one per person)

Procedure:

1. Roll the die for each category listed on the back of this page.
2. On the back of the paper list the five criteria for your environment.
3. On the front of the blank paper, draw an imaginary “insect” that would be adapted to this environment.
* The insect MUST have the required structures to be an insect.
* The insect should utilize biomimicry by using bits and pieces of the different Orders of insects we have studied. These insects have already adapted to a variety of environments.
1. Indicate/explain how your insect is adapted to each of the five criteria you got from rolling the die. This can be in sentences or with arrows & brief labels.

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| **Grading Rubric** |
| **Category** | **1** | **5** | **10** | **Points** |
| **Criteria** | No criteria are listed or shown. | Criteria are difficult to find OR they may only be implied by drawings. | All 5 criteria are written out and easy to find. |  |
| **Adaptations** | Adapting to the environment is not addressed. | It is unclear how the insect’s adaptations address the criteria OR not all criteria were covered. | The insect has a clear, specific adaptation to deal with each of the 5 criteria. |  |
| **Biomimicry** | No biomimicry was used in creating the insect | Only one or two aspect of the new insect mimics a real insect | Three or more traits of the new insect mimic different real insects. |  |
| **Extra Credit** Potential (not guaranteed) for creativity, drawing the background, or drawing your predators and food. |  |  |  |  |
| **TOTAL POINTS** |  |

A) **WHERE DOES IT LIVE?**
1 – mountains/pine forest 5 – near a volcano
2 – flatlands/grasses 6- in a cave
3 - rocky, harsh 7- in thorny bushes
4 - small island 8- maple forest

B) **HOW MUCH WATER IS THERE?**
1 or 2 - almost none; dry and barren
3 or 4 - monsoon part of the year, drought the rest (monsoons involve several months of rain)
5 or 6 –Average, seasonal precipitation happens (more spring & fall, but no monsoons)
7 or 8 – rains or snows every day

C) **WHAT IS THE CLIMATE/WEATHER LIKE**?
1 or 2 – always hot
3 or 4 – seasons change from hot to cold
5 or 6 – always cold and windy
7 or 8 - sub-zero temperatures

D) **WHAT IS AVAILABE TO EAT?**
1 - leaves from tall plants 5 – small animals (mice-like)
2 - fungus growing under rocks 6 - birds
3 – berries and roots 7 – swift runners (deer-like)
4 – small plants 8 – other insects

E) **WHAT PREDATORS ARE HERE?**
1 - Stompsuckers squash the insect flat & lick up the squishy mess.
2 - Vampire bacteria infect the insect and digest all of its blood.
3 - Buzzbugs lay eggs that burrow under the insect’s exoskeleton and then hatch out.
4 - Web devils set gooey traps of slime to catch the insect.
5 – Sunnysloths are slow moving animals that glow like lightning bugs to attract insects to them.
6 - Megaworms leap out of the ground and swallow the insect whole.

7 – Bomber birds herd the insects into groups then eat the swarms.

8 – Sleeping fungus that give off an ooze that puts the insect to sleep then digests it alive