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## High School Arthropod Display Case

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Master's Project Proposal  
High School Arthropod Display Case  
Daniel Taylor

Background:

I teach at a high school in Northfield, Minnesota. I love teaching kids science and getting them excited about it. Unfortunately, I currently only teach chemistry and there are almost no elective science classes at our high school. I would love to get students interested in learning about entomology with me or on their own. Few students have ever been exposed to insect in a positive light ever before.

I have had some success at our school with entomological engagement. Each year during the zoology unit I go in to the biology classes as a "guest lecturer" and give a presentation on insects. It is fun and exciting, but that is the current extent of entomology at our high school. Next year our students are going to have a short "free time" class for twenty minutes a week and I will be doing it on insects.

Goal:

The overall goal of this project is to get high school students interested and engaged in the study of entomology. There is a display case that I will be in charge of in a hall at the high school. In years past there have been a lot of different things displayed there, but I would like to create high quality scientific displays. This should get students asking questions and hopefully interested in attending my "free time" classes. I don't want too much written in the display, I want students to ask questions.

The focus of each of the displays will be on Minnesota insects and generally on the positive aspects of insects. I want half of the display to be pretty much set, showing the classification of insects. Then the other half I want to have nine different displays, so that I can rotate between them each month.

The topics to be discussed are listed below.

Life Cycles

In this display I want to show the difference between incomplete and complete metamorphosis. I would like to show the difference between a grasshopper and polyphemous moth from my collection.

Silk Production

This will mostly be showcasing arachnids. I want to build a model showing the different types of silks. I want to show different types of webs that are produced.

Decomposition

I want to get some live dermestid beetles cleaning skulls in there for this. It would be awesome to have time lapse photography of them cleaning some of the skulls I have in my freezer.

#### Pollination

This one may include some things that are not insects as well, but graphs showing what percent of different flowering plants are pollinated by different animals would be good.

#### Migration

Map highlighting the monarch migration across North America.

#### Social Structures

Models of paper wasp hives and ant farms. It would be really cool to show the complexity of the genetics of a colony. I may also include army ants, even though they aren't in Minnesota, they are kind of the most incredible insects alive.

#### Invasive Species

A look at the emerald ash borer, gypsy moth, and Japanese beetle.

#### Wetland Monitors

Comparisons of what healthy and unhealthy wetlands look like in terms of diversity. A few maps or graphs of the wetlands in town that I help monitor would be good too.

#### Pest Insects

A short discussion of what IPM is. Examples of pests, and some examples of beneficial insects for agriculture.

#### Plan:

Each of these displays will have some of the following in them (at this point each display is not completely planned out yet):

- Video/Automatic PowerPoints – There is a way to hook a monitor into the display and be consistently running videos or PowerPoints.
- Display posters – I want to be able to print some of the images from textbooks blown up very large so students can see small things up close (ex. Spider spinnerets)
- Physical Models – For some things (ex. Aphid masses on plants) I want to build a three-dimensional model of what is happening, so students can kind of see the scale of numbers of insects.
- Physical Specimens – I have a large collection of insects (>1,000 pinned) and I want to use them as educational tools.

- Live Insects – In my classroom I have several living insects (tarantula, vinegaroon, mealworms, dubia roaches) that I would like to use in the displays.
- Old Textbooks – I have several old (and new) entomology texts that I really like and would like to use them to put on display, the posters may be excerpts from these texts.
- Interactive Activities – I want to have one space where there will be an insect of the month or week features, where if they can come and tell me the name and a new fact about them I will give them some candy or something.

Timeline – I need this to be done before school starts, so the deadline for the actual displays will be August 30<sup>th</sup>.

Outcomes:

Initially I want to engage with students and get them to come to my “free time” classes during next school year. This is the immediate outcome I am looking for. I want to students to have questions, and do their own research.

The outcomes of this project have extremely high aims. I want to change the science culture of our high school and community. Northfield is home to two liberal arts colleges and the fine arts are always on display for our community. Electives are seen as the interesting and exciting topics at the school (combined the music and art departments are as large as the science department is, no music/art is required, 3 science classes are required per student). I want this to be the beginning of a shift to get more of our students into and engaged in science at our high school.

My hallway is a well-traveled hallway at our school and many community members will also pass by the display. I hope to show the public that our science department is capable, knowledgeable, and applicable. Positive community support is essential when we are asking for more money from them.