

**To:** Parents of next year's sixth-grade science class.

**From:** Mr. Bird, grade 6 science teacher.

**Re:** Sixth-grade insect project.

**Date:** May 2019



Dear Parents,

Your child will be required to complete an insect project in the first trimester of sixth grade science. Please take time to read the information here and in your child's handout. They both contain important information about the insect assignment.

While there is no science requirement over the summer (this project could be reasonably completed after school starts in August), I am sending this information now, so that your child can start collecting during the summer if they choose to do so. If so, the **students need *only* to work on collecting and storing** their insects during the summer (storage includes keep track of data: date, location, and collector). The rest of the project, including specific pinning procedures, will be attended to in the fall during regular science classes.

I encourage families and friends to help students with this undertaking, especially with regard to collecting. Parental involvement in an endeavor of this nature can be a wonderful thing, but please remember that your child is ultimately responsible for this project. Help them, encourage them, take them outside, but also allow them to have responsibility for the assignment. This is their project.

It is my hope that this project is fun, educational, and challenging for your child.

#### OVERVIEW:

During the course of this multidisciplinary unit, including both science and computer technology, the students will be required to turn in a collection of insect specimens. They will capture, mount and label the specimens in their collections. Collecting is commonly done through the summer and early fall when insect populations are abundant. The insects will need to be mounted with insect pins (provided by the school), and labeled according to specifications given in class. The labels used for the project will be produced at school in the computer lab. In order to do this the students will learn how to manage and print a database.

The insects in their collection will need to be classified into scientific Orders. This requires that students understand the basic system of scientific classification, and learn how to use insect field guides to identify their insects.

The students may use any resource materials available to them to complete this project. The students are allowed to get help from anyone while collecting for this project, and other people are allowed to collect for them. However, students may not

buy insects for this collection, nor use insects from an existing collection. Specimens must be collected for this project.

#### GOALS:

The goals of the project are as follows:

1. The student will become more aware of the diversity of the natural world (especially the world of insects).
2. The students will become aware of the important role that insects play in ecosystems worldwide.
3. The student will develop a working knowledge of a field guide.
4. The student will gain basic understanding of taxonomy (the scientific classification of organisms).
5. The students will be able to identify characteristics of insects and distinguish insects from other organisms. They will also be able to classify common insects into scientific Orders.
6. The students will understand that insects have developed a wide range of adaptations to better survive in their environment.
7. The students will experience facets of the curatorial work that professional entomologists do as they manage their collections.
8. The students will gain a working knowledge of a computer database.
9. The students will learn the importance of organization and planning while completing a long-term project.

If you have questions about this project, please call the school (303-756-9481 ext. 352), or you can reach me at my home (303-778-7838). Leave a message. You can also email me at [jbird@st-annes.org](mailto:jbird@st-annes.org) (probably best). I will get back to you as soon as I can. I hope you have a wonderful summer. See you in the fall!



#### IN THE BLEACHERS by Steve Moore





# Sixth Grade Science

**To:** Students in next year's sixth-grade science class.

**From:** Mr. Bird, grade 6 science teacher.

**Re:** Grade six insect projects.

**Date:** May 2019



Dear Student,

Please read this handout carefully. It contains directions about a project that you will turn in during the first trimester of sixth grade science. **KEEP THIS HANDOUT.** If you have questions, please call me (303-756-9481 ext. 352 school, or 303-778-7838 home) and leave a message. I will return your call as soon as I can. You can also email me at [jbird@st-annes.org](mailto:jbird@st-annes.org) (probably best).

**Introduction:** In the first trimester of 2019, you will turn in a collection of insect specimens. The specimens are to be correctly mounted and labeled. The information provided in this handout has been made available now so that you can collect over the summer if you wish. You are *not* required to collect over the summer, but you may like to get started early. Many students choose to take advantage of being in good “buggy” places during the summer to begin their collections.

There are several reasons why I feel this is an important unit of study. First, I believe that it is very important that you are given chances during your educational career to explore the natural world. I think that it is equally important that you develop an understanding, if not a true appreciation of the diversity of nature. It is my hope that this project will serve as a building block for environmental awareness that I believe is very important in today's society. This increased awareness is necessary if you are to make wise decisions about environmental issues in the future.

Another reason why this unit is valuable is that it gives you experience managing a long-term project. You may not have had a lot of practice at this in the past. This project will also give you valuable practice using a database, as you will use the computers to input data and print labels.

Finally, this unit requires that you work with field guides while you classify the insects in your collection. Hopefully, you will become aware of the value of field guides of all kinds. I hope that you will continue to turn to these resources throughout your life.

**Text:** You will need a copy of *Insects: a Golden Guide* by Herbert Zim and Clarence Cottam. You will also need a copy *4-H Entomology* printed by the Colorado State University Cooperative Extension. It contains great information about collecting and preserving insects. These books will be provided by the school when classes resume at the end of summer.

**Collecting Insects:** In the United States, the number of described insect species is approximately 91,000. You should not have trouble finding insects if you look! A good place outdoors to look for insects is on plants. Areas with diverse plant populations will attract more species. Insects are also found in various concealed areas, such as leaf litter, under stones or other objects, in fungi, under bark, in dead logs, in decaying materials, and in the ground. Many insects live in water, either throughout their lives or



during their immature stages, and may be found in most aquatic environments. Insects that live in water during their immature stages are usually found near water as adults. Many insects are attracted to lights at night.

Insects can be captured in a number of ways. Nets are commonly used to capture insects. Various types of traps may also be constructed to capture insects. Please note that while most insects are harmless, and can easily be handled, there are a few kinds of insects that can bite or sting. Please be especially careful when collecting bees or wasps.

**Killing Methods:** A humane way to kill insects is by putting them in the freezer. Simply put the specimens in a sealed container and place them in the freezer. Leave them overnight. The freezer works very well, but if one does not have easy access to a freezer killing jars are used. Killing jars are of various sizes and shapes, depending on the use they will receive. Wide mouth jars are best. All killing jars should be labeled POISON. Jars can be made with nail polish remover and cotton (or some other absorbent material). Moisten the cotton with water then place a few drops of nail polish remover on the cotton, put the cotton in the jar and cover. Do not use too much liquid as some types of insects make poor specimens when wet. New nail polish remover should be added every 3 or 4 days. Be sure to use the nail polish remover in a well-ventilated area. Insects can also be dispatched in rubbing (isopropyl) alcohol. About 2 centimeters of rubbing alcohol in a jar is sufficient. Remove and pat the insects with a paper towel to dry before storing in the freezer. Do not use this method for fuzzy insects (such as bumblebees), butterflies, or moths.

**Mounting:** Most insects are mounted with insect pins, which will be provided by your teacher. Insects must be properly pinned for you to receive full credit for your project! **If you have access to safe freezer space, I recommend you wait until school starts to pin your insects so that you can receive good pinning instruction first.** Unpinned insects store well in the freezer provided that they are frozen before they dry out. **Be aware that frozen insects are brittle.** Frozen insects can be thawed and then easily pinned. When you return to school in the fall, you will receive instruction on proper pinning. You will then use the following instructions to get your insects mounted.

Most insects are pinned vertically through the thorax (the thorax is the section with the legs attached to it). Please note that **the distance between the top of the pin and the top of the insect (points included) is 1 centimeter.** It is best to pin your insects very soon after they are dead. **If the insects are allowed to dry out they will become brittle and difficult to pin.** Store the pinned insects on a block of foam or some other material until you are ready to assemble the final project.

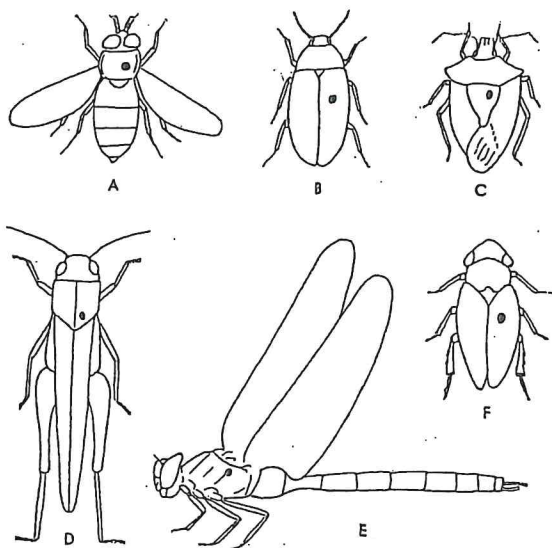
**Keep your pinned insects in a safe place!**

It is a good idea to collect a few extra insects in case something happens to some of the specimens in your original collection.

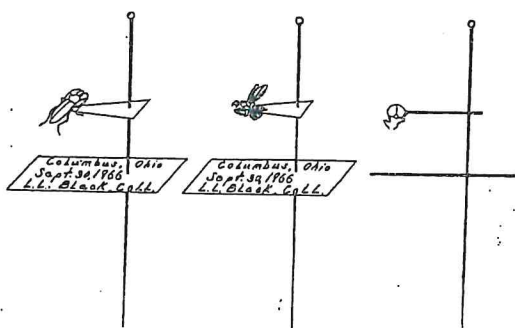
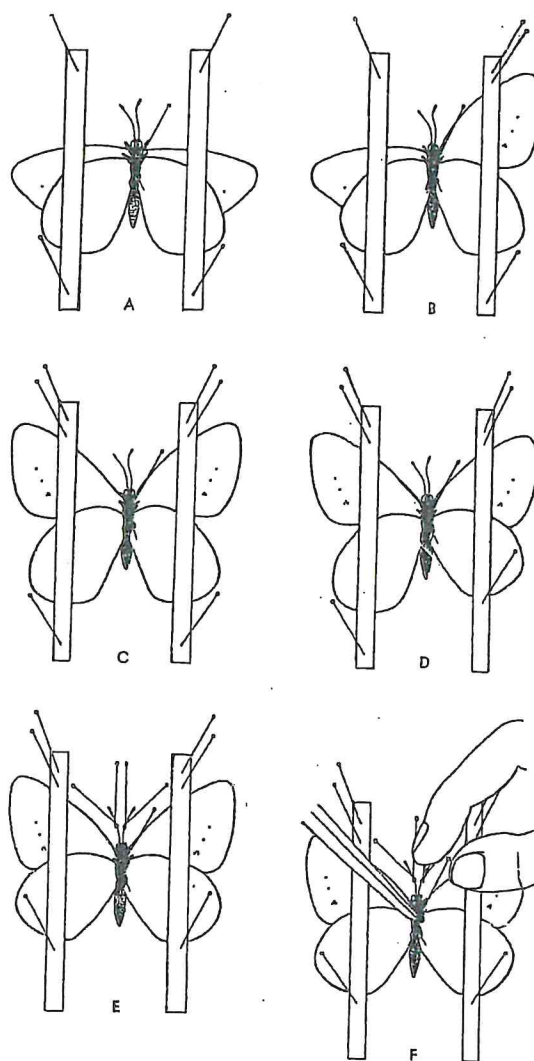
Remember, **Dry or frozen insects are brittle and will break easily!**

If unpinned insects become dry, they can be relaxed in a sealed jar containing a few cotton balls soaked in rubbing alcohol (isopropyl alcohol). Leave the insects overnight, but no longer than two nights. Pin the insects when they are relaxed.

The illustrations on this page and on the last page of this handout give you more information on proper pinning techniques.



How insects are pinned. The black spots show the location of the pin in the case of flies (A), beetles (B), bugs (C), grasshoppers (D), dragonflies and damselflies (E), and leafhoppers, frog hoppers, and planthoppers (F).



Insects that are too small to be pinned are mounted on small "points" using a small amount of glue. A point is a small, triangular piece of heavy paper no longer than 1.3 cm (1/2 inch) long.

Proper  
Point Size

Follow the steps above to spread the wings of moths, butterflies, and other insects with "interesting" wings.

**Labeling:** Your labels will be printed in the computer lab. Insects labels should include the following information: the common name of the insect, the scientific name of the order the specimen belongs to, the



location where the insect was collected (city or town or county and state), the name of the person who collected the specimen, and the date the insect was collected. **For the summer you only need to keep track of the location, date and collector.** We will work on identification and insect orders in the fall. The computer-generated labels will be similar to the example shown:

The labels you produce in the computer lab will be similar to this.

Antlion  
Neuroptera  
Complete  
COLORADO: Denver  
8 July 2017  
Grant Mahon

**Requirements:** The basic assignment is to collect, mount, identify (to scientific Order), and label different insects. Be aware of the following perimeters:

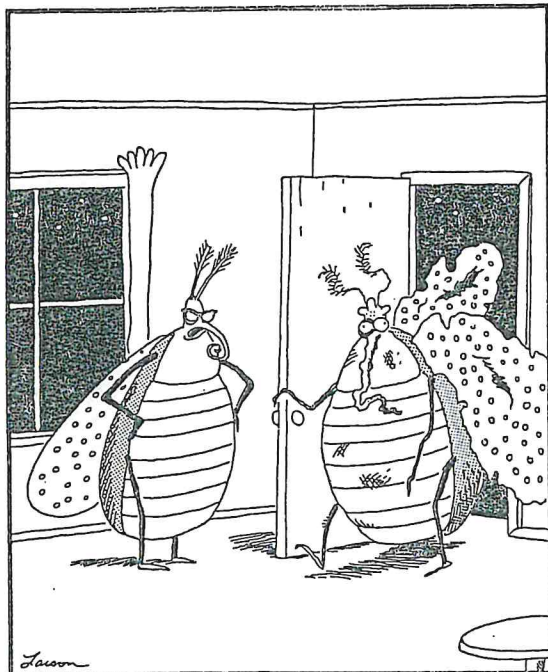
- In order to be eligible for an 'A', you must turn in at least 25 different insects, and 7 different Orders (groups) must be represented in your collection.
- In order to be eligible for a 'B', you must turn in at least 21 different insects, and 5 different Orders (groups) must be represented in your collection.
- In order to be eligible for a 'C', you must turn in at least 16 different insects, and 3 different Orders (groups) must be represented in your collection.

**Rules regarding your specimens:** All insects must be different species. This collection should contain adult insects only, so please avoid collecting nymphs and larvae (caterpillars for example are not mounted on insect pins). **All insects must be collected for this project.** You may not use insects from an "old" collection. You may not buy insects for this collection. You may ask other people to collect for you, and you may trade with classmates.

**Due date:** The due exact date for this project will be determined in the fall. It will probably be due sometime in early October (late September at the earliest). Your collection ***is not due*** when you return to school in August, so all you need to think about over the summer is collecting and storing your insects (with data).

**A note regarding environmental impact:** I know that some students worry about killing insects. Scientifically collecting insects virtually never impacts their populations. The real threats to insect populations are habitat destruction (like when the land that is bulldozed to build roads, houses, and shopping malls) and pesticides that often impact non-target species of insects (such as those applied to our fruits, vegetables, grains). Moreover, we routinely and inadvertently kill thousands of insects when we drive our cars (take a look at the grill of your car), but that does not even put a dent in any population of insects. Insects are extremely diverse (well over 1,000,000 species have been identified), and insect individuals are extremely abundant (the number of individual ants is estimated at over 100 trillion!). The few you collect for this project will have little impact. I would never assign a project of this nature if I felt it threatened the environment.

**A final note:** I encourage you to get help for this project. Ask your family and friends to help you. You may work with other people to complete this project, but **remember that this is your project.** In the end, you are the one who is responsible for its completion. You are responsible for keeping track of your progress, and for turning in a completed project on the due date (to be announced in the fall). Start now! Don't wait till the last minute. Have fun!



"Good heavens—just look at you! You've been down at the Fergusons' porch light, haven't you?"

## THE FAR SIDE



"Johnson, back off! It's an *Armandia lidderdalii*, all right — but it's rabid!"

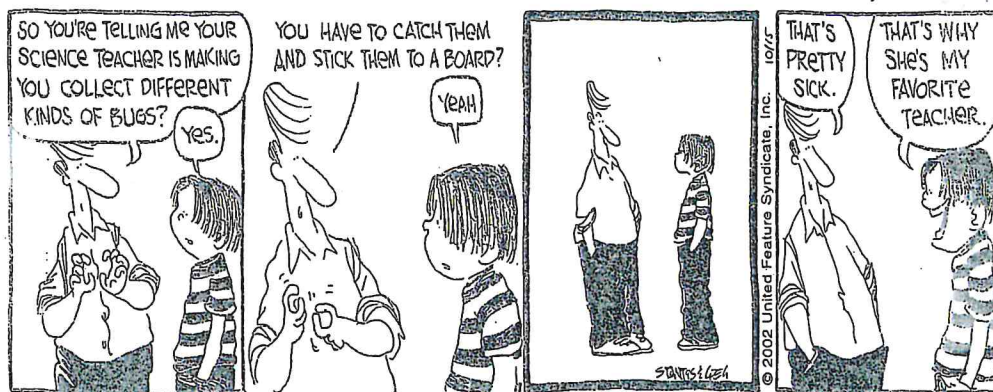
## The Buckets

by Scott Stantis



## The Buckets

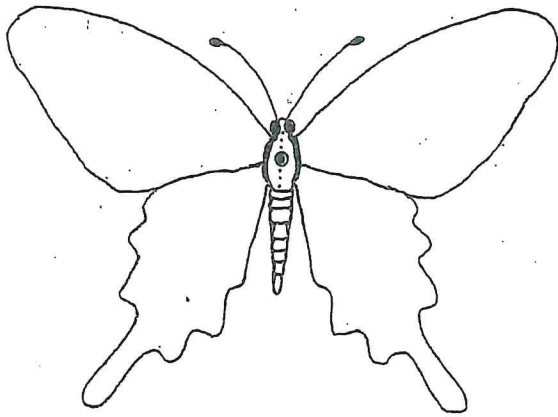
by Scott Stantis



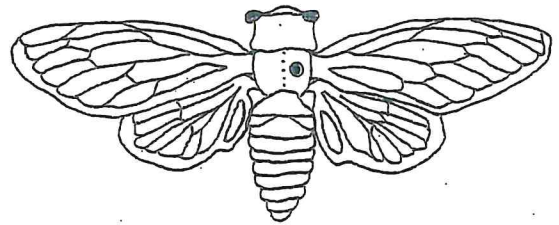


# WHERE INSECTS ARE PINNED

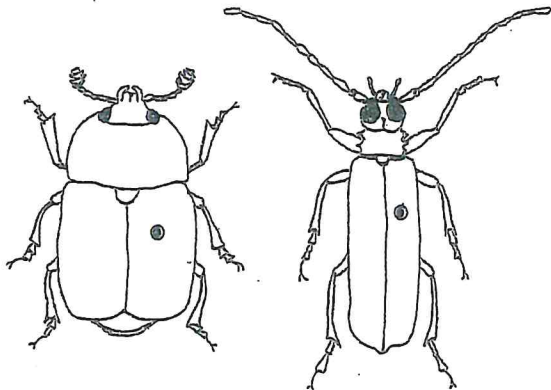
● = PIN LOCATION



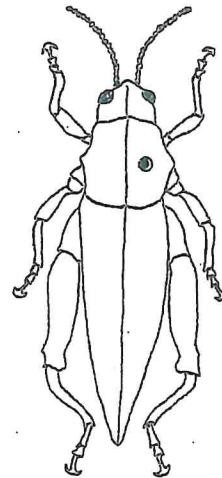
BUTTERFLY



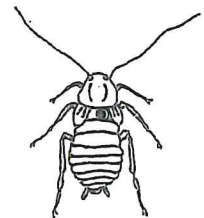
CICADA



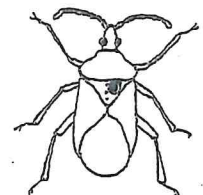
BEETLES



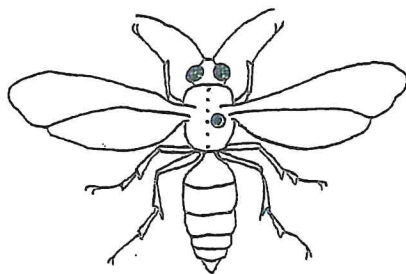
GRASSHOPPER



ROACH



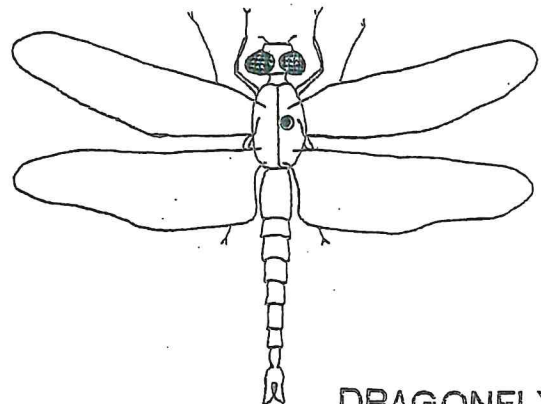
STINK  
BUG



WASP



FLY



DRAGONFLY