

Creating a Herbarium Classroom Collection

Sharing This Collection with other Elementary Schools in the State

Overview:

This activity is designed to encourage every classroom in the state to have their school become familiar with the University of Montana Herbarium website. By participating in this activity, your students will gain an understanding of the importance of herbariums, their uses, and comparisons with herbarium specimens from other areas of their state. These activities have been developed for elementary students but could easily be adapted to meet the needs of middle school students. Our school yards are great classrooms for learning, and our hope is that every school will seize this opportunity to explore and discover the treasures in their own school yard.

Objective: Students will be able to identify plants native to their own school yard. They will also become familiar with plants native to other parts of the state. This allows students to compare their herbarium specimen to those from other areas. They will then start a classroom herbarium that they will share by sending power points, pictures or journals to other schools in their state.

Time Required: This activity is designed to begin the first or second week of school and be completed in two and a half to three months.

Grades: third through fifth with modifications made for optimum learner outcomes.

Note: Soon after beginning this activity a copy of this lesson plan and a letter inviting other schools to participate should be mailed to schools in your state that you want to include. Schools in northern, eastern, western, southern, and middle Montana were chosen to be a part of this activity. A sample letter is attached at the end of the lesson.

Materials:

- Journals for every student. These can be purchased inexpensively at big box stores and will be used extensively throughout the lesson.
- Plants collected from the school yard.
- Gloves, shears and trowels for collecting specimens.
- Small plastic bags for collection containers
- Paper, newspaper, blotting paper, good cream or white cartridge paper – preferably 100% rag or chemical wood pulp, small and large envelopes,

stamps, peel off labels, old phone books for pressing, and cardboard pieces about 12"x18".

- Pins, glue – preferably water based woodworking adhesive, library paste, latex adhesive, linen or cotton thread, and string.
- Map of your state
- Journals for every student to record
- Pencils, pens, markers, colored pencils and watercolors for recording date
- Digital camera to record work
- Computer and printer for herbarium research, addresses of other schools in the state, and power point creation
- Books for reference and identifying plants

Lesson 1

Question: What is an herbarium?

Materials: Samples of herbarium specimens, website visits, books, journals

Time: approximately three or four 30 minute class periods.

The students will spend time researching herbariums on the web and pass sample herbarium specimens around the classroom. Books will also be distributed and students will become familiar with what a herbarium is and why it is important. Samples can be recorded in journals.

Lesson 2

Question: Will other schools in the state have the same plants in their schoolyards as we do?

Materials: Map of Montana, journals, paper, envelopes, stamps, computers

Time: Approximately 45 minutes, possibly two 30 minute classes.

We will discuss what we think school yards in other parts of the state look like compared to our own. We will then decide which school in the different areas of our state we would like to invite to participate in our project. Each student will then prepare the letter for mailing to his or her chosen school looking up the address on the computer and marking the area on the map with a label. The letters will be mailed. This information will be recorded in the journal.

Lesson 3

Question: How do we identify plants?

Materials: Plant identification websites, journals and a computer.

Time: Approximately two to three class periods of 30 – 45 minutes.

We will begin by going over the plant identification worksheets together. We will look up different plants on the computer and try to identify their parts. These will be recorded in the journals.

Lesson 4

Question: What will we find in our schoolyard?

Materials: Gloves, shears, plastic bags for collections, computers and printers.

Time: Approximately two 45 minute class periods.

Students will work in pairs in the outdoor school yard and gather at least two different specimens each. They will then use the skills they learned in the previous lesson to identify the specimens and decide if they are native or exotic. When all the specimens have been collected they will be recorded in journals.

Lesson 5

Question: How do we prepare our specimens for pressing?

Materials: cardboard pieces, blotting paper, phone books for pressing or other heavy objects.

Time: Approximately 15 minutes a day for four to five days or until the specimens are thoroughly dried.

Use the cardboard and squeeze the specimens between layers of newspapers or blotting paper. Use the heavy objects to weigh the pressed specimens changing the paper daily for 4 – 5 days or until the specimens are thoroughly dry. Record the process in journals.

Lesson 6

Question: How do we mount our specimens on paper?

Materials: examples of already mounted specimens using either the strapping method or by gluing, cartridge paper, glue, paste adhesives, pins labels, and small envelopes or baggies.

Time: Approximately a week of 30 – 45 minute class periods.

Carefully arrange prepared specimens on cartridge paper. The specimens should be mounted according to the examples shown by using either the strapping method (use linen or cotton thread) or by gluing. Special mounts may be made with pins. Next the specimens need to be labeled which should include the taxonomic denomination of at least family, genus, and species. It should also include the date and place of collection. More details may be included. Label information may be found on the U of M herbarium website. Lastly the mounted specimens should be placed in bundles which should be kept together with string. The bundles should then be labeled with geographic origin or taxonomic level – whatever will identify the bundle. All of these steps should be recorded in the journals. Watercolors, markers, pens or pencils may be used for these entries.

Lesson 7

Question: How do we arrange our finished product?

Materials: computers, journals, books, and possibly an expert in the field.

Time: Approximately two or three days of 30 minutes class periods depending on how in depth you make this lesson.

Specimens may be divided by their families, alphabetically, or geographically. Use the website, experts in the field, and/or books to find how species and families are arranged. Use all this knowledge to divide the specimens into groups which will reflect the systematic arrangement. Record this information into the journals.

Lesson 8

Question: How do we share our results with the other schools?

Materials: digital camera, journal entries, computers, printers, paper, envelopes, stamps, and blank CD's.

Time: Approximately two or three days of 30 minute class periods.

Ideally a power point will be made of the classroom herbarium samples. This could be done using older students as mentors or with a class proficient in making power points. If this is not an option copies of journal entries and/or labeled digital photos could suffice. Make sure each pair of students sends a CD, complete journal entry or photos to each school they originally invited to participate in this activity.

Lesson 9

Question: How do we compare to the other areas?

Materials: information gathered from the participating schools, computers and printers, journals.

Time: Depending on how many projects we receive approximately one to two weeks of 30 -45 minute class periods.

For the culmination of this project we will view all the materials we receive and compare and contrast them with our own herbarium specimens. We make note of which plants are native to all areas and which are not. We will record the finding in the journals.

Special Note:

We plan to make our classroom herbarium user friendly by inviting other classes to view our finished product and hopefully become excited by our findings. We will invite other classes to find more and varied specimens in our outdoor school yard and help them start their own classroom herbariums.

The following Montana Content Stands for Science were addressed:

Content Standard 1 - Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate results and reasonable conclusions of scientific investigations.

Content Standard 3 - Students, through the inquiry process demonstrate knowledge of characteristics, structures, and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

Assessment: On the following pages you will find a checklist to use for evaluating and grading this activity.

Herbarium Project Assessment Checklist

Possible Points

Your Score

(10)

Lesson 1

Good participation, knowledge of what an herbarium is, and good journal entries

Lesson 2

Appropriate participation, proper letter composed, understanding of places on a MT map. Journal entries complete.

Lesson 3

Demonstrate understanding of the plant identification process and research methods to obtain information. Journal entries complete.

Lesson 4

Correct amount of specimens collected and identified. Journal entries complete.

Lesson 5

Species properly prepared for pressing and paper changed daily. Journal entries complete.

Lesson 6

Specimens mounted, labeled, and bundled correctly. Journal entries complete.

Lesson 7

Specimens arranged properly by families, alphabetically,

or geographically. Journal
entries complete.

Lesson 8

Classroom herbarium samples properly
gathered, recorded, copied and sent
to the school originally contacted.
journal entries complete.

Lesson 9

Materials gathered from other schools
and accurately compared to our own
with likenesses and differences noted
in journal entries.

Lesson 10

Overall impression of project materials,
participation, and journal entries.

Possible Total

Your Score

(100)

Comments:

90-100 Points = A

80-90 Points = B

70-80 Points = C

60-70 Points = D

Below 60 = F

References

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