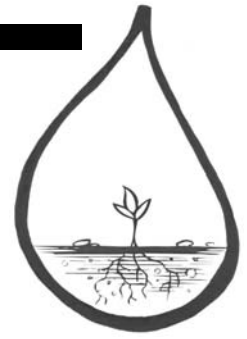


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TOPIC:

Background research

OBJECTIVES:

- Students will practice basic internet research skills.
- Students will explore the breadth of information available on the Duluth Streams website.

LENGTH:

30 minutes to 1 hour

ENVIRONMENT:

Indoor location with computers and internet access.

MATERIALS:

- Computers with internet access
- A computer projection screen
- Copies of the Duluth Streams Scavenger Hunt for all students
- A copy of the answer sheet
- Prizes such as candy or pencils for all students

Duluth Streams

Background:

The internet provides a powerful tool for students seeking background information for environmental service-learning projects. The Duluth area is fortunate to have the comprehensive Duluth Streams website, which includes a wide array of scientific and social statistics for the streams and surrounding landscape. This website also has links to real-time water quality data for some streams in the area watershed. Because of comprehensive nature of the site, however, it can be hard to locate specific pieces of information. Therefore, students explore the website in this activity through a scavenger hunt. Once oriented, they will find it easier to identify and locate information that might be found there.

Activity Outline:

Beforehand:

Because the Duluth Streams website is so comprehensive, it is imperative to spend 1-2 hours exploring the contents before beginning the activity. The *highlights for new users* link on the homepage connects to a concise summary of the website construction—*Explore Duluth, Understanding, The Streams, Citizen Involvement, and Stormwater Management*—and contents. The *Search, Glossary, and Sitemap* links located on the bottom of the homepage are also helpful means of exploring the site.

Complete any procedure necessary to secure access to an internet-connected computer lab. This activity will work best if the lab includes a computer connected to a projection screen, which can be used to guide students through the website. For added efficiency, all computers may also be set so the Duluth Streams website (www.duluthstreams.org) is the homepage.

Copy the scavenger hunt worksheet for all students.

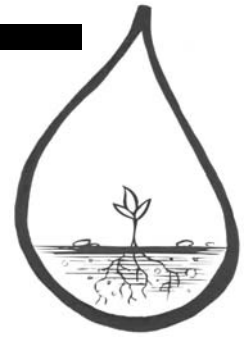
Searching the Site:

Instruct students to arrange themselves at computers in groups of 2-4. When all are seated, remind students of the objective of the activity. The internet, especially the Duluth Streams website, is a powerful tool for finding background information for their service projects. Provide a brief introduction to the Duluth Streams website, contents and navigation. If possible, demonstrate navigation around the site using a projector. Suggest that a challenge might help students explore the site more effectively. Plus, it will be more fun!

Make sure that all students are grouped for the activity—2 to 4 per group. Students will work in these groups to explore the site looking for answers to the scavenger hunt. They should record every step in navigating from the homepage to the answer, so they can describe how to get back later. Mention that

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students who can accurately tell the class how to find an answer at the conclusion of the hunt may win a prize.

To ensure that all questions on the worksheet are answered, assign half of the groups to begin with the front side of the sheet, and half to begin with on the back. Answer any questions. Then, provide students 15 to 20 minutes to work quietly on the scavenger hunt. Visit briefly with each group, noting any answers that seem to be particularly difficult to find.

Awarding Good Work:

At the conclusion of the work time, ask students to return to the Duluth Streams homepage. Ask if there were any answers that groups could not find. Select other groups willing to describe where to find each of these answers. If correct, award prizes to these students. Because there is often more than one path to the correct answer, it will be useful to allow multiple groups to describe the paths they identified. The entire group can discuss which paths are easiest. The answer sheet may also describe additional paths to answers.

Continue the process until all questions have been answered. Students should record paths to any answers they were unable to locate.

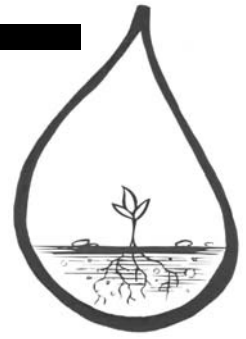
Make sure that all students receive a prize.

Lessons Learned:

Ask students to return to the homepage. In fact, it may be useful for them to switch off monitors in order to focus more fully on group discussion. Review again the objective of the activity. Discuss with students what information might be available on the site to aid their project research. Where might they look to find it? Ask for the keys to navigating the site. What is the best way of getting around the site? Finish review by expanding the discussion. What other organizations or websites might we explore for background information on the service project. What are some searches that we might do to find other websites? If time permits, try a few of these searches, and explore interesting links that turn up.

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Duluth Streams

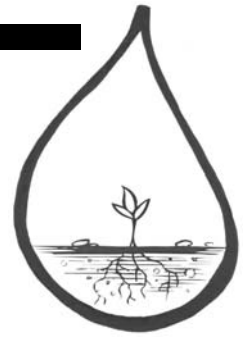
Scavenger Hunt

Test your knowledge of Duluth-Area streams! Work in teams to explore the website www.duluthstreams.org. Answer the following questions with information from the website. Raise your hand when you have finished the scavenger hunt.

1. What's new on the Duluth Streams Site?
2. What is the *average precipitation* for this month as recorded at Duluth International Airport?
3. How many streams are there in the Duluth Area?
4. What is an *impervious surface*, and what harm does it cause to a watershed? Which Duluth-Area trout streams are above the Stream Impact Threshold?
5. Where are good brook trout *fishing spots* on Miller Creek?
6. What *online data sheets* are available for St. Louis River Watch?

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7. What is the definition of *Eutrophication*?

8. How does the *central mudminnow* survive periods of low water?

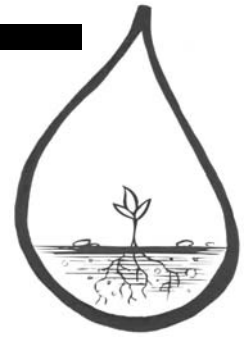
9. Which Duluth-Area streams have *real-time data* available? What is the name of the machine used to collect this data?

10. What are 2 steps that you can take today to *make a difference* in your watershed?

11. What is an *illicit discharge*? Why is Duluth concerned about illicit discharges?

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Duluth Streams

Scavenger Hunt Answers

Test your knowledge of Duluth-Area streams! Work in teams to explore the website www.duluthstreams.org. Answer the following questions with information from the website. Raise your hand when you have finished the scavenger hunt.

Answers in Italics. How to get there is in Bold Type.

1. What's new on the Duluth Streams Site?

Click the **WHAT'S NEW** link at the bottom right corner of the HOME PAGE. This will take you to a page that explains periodic updates on the website.

2. What is the *average precipitation* for this month as recorded at Duluth International Airport?

About 1.9 in. Click the **EXPLORE DULUTH** link on the HOME PAGE. Click the **CLIMATE** link on the next page. Then click **HISTORICAL WEATHER DATA**. Use the graphs to solve this problem. The **EXPLORE DULUTH** page includes information about the local environment and history.

3. How many streams are there in the Duluth Area?

42. This is stated on the HOME PAGE. You can also click the **THE STREAMS** link. Then select **STREAM LOCATOR MAP** under any of the **SELECT A STREAM** links

4. What is an *impervious surface*, and what harm does it cause to a watershed? Which Duluth-Area trout streams are above the Stream Impact Threshold?

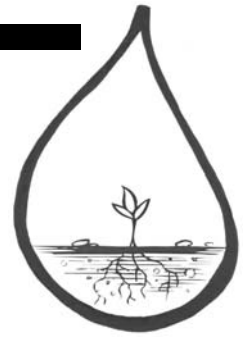
Land surfaces such as roads, parking lots, buildings, etc that prevent rainwater from soaking into the soil. The water increases in velocity causing more erosion; it warms causing potential heat stress for downstream trout; it picks up roadway contaminants; and the loss of vegetation removes a "sink" for dissolved nutrients - plant uptake. You can find this information in the **GLOSSARY** link located at the bottom of the HOME PAGE. Also click **UNDERSTANDING**. Then, click **WATER QUALITY IMPACTS** in the black box. Finally, click the **IMPERVIOUS SURFACES** link. Use the graph to answer the second question.

5. Where are good brook trout *fishing spots* on Miller Creek?

Fishing spots for wild brook trout include Lincoln Park, Lake Superior college campus and the Chambersburg area. Click **EXPLORE DULUTH** on the HOME PAGE. Then click **RECREATION** in the black box. Finally, click the link for **FISHING HOLES** on the left hand side of the page. The **RECREATION** page also includes information about trout fishing, hiking and skiing.

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6. What *online data sheets* are available for St. Louis River Watch?

Invertebrate Collection Protocol, Invertebrate Tally Worksheet, Stream Discharge Worksheet, Water Quality Worksheet and Monitoring Site Sketch Worksheet. Click CITIZEN INVOLVEMENT from the HOME PAGE. Then click VOLUNTEER ACTIVITIES in the black box. Click the link for ST. LOUIS RIVER-RIVER WATCH on the left side of the page. Finally, click the link for DATA SHEETS on the left side of the page.

7. What is the definition of *Eutrophication*?

The process by which lakes and streams are enriched by nutrients (usually phosphorus and nitrogen) which leads to excessive plant growth - algae in the open water, periphyton (attached algae) along the shoreline, and macrophytes (the higher plants we often call weeds) in the nearshore zone. Click GLOSSARY at the bottom of the HOME PAGE. Then click "E". Finally, scroll down the page to find the definition.

8. How does the *central mudminnow* survive periods of low water?

Central mudminnows survive periods of low water levels by "burrowing" into soft sediments. They can also breathe air. Click UNDERSTANDING from the HOME PAGE. Then click ORGANISMS in the black box. Click the FISH link on the left side of the page. Finally, click CENTRAL MUDMINNOW under FISH IDENTIFICATION on the right half of the page. Scroll the information for your answer.

9. Which Duluth-Area streams have *real-time data* available? What is the name of the machine used to collect this data?

Chester, Kingsbury and Chester Creeks and the St. Louis River. Click THE STREAMS from the HOME PAGE. Then select the STREAM LOCATOR MAP under the SELECT A STREAM menu in the black box. Use the DATA AND INFORMATION AVAILABLE FOR DULUTH STREAMS table to find information available about Duluth Streams—including real-time data.

Stream Monitoring Units (SMUs). Click THE STREAMS from the HOME PAGE Then click ABOUT DATA in the black box. Finally, click the MONITORING EQUIPMENT link on the left side of the page. The ABOUT DATA section discusses how data is collected and controlled.

10. What are 2 steps that you can take today to *make a difference* in your watershed?

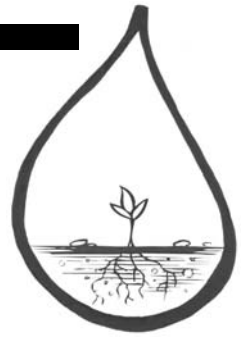
There are 10 Steps You Can Take Today on a Citizen Fact Sheet. Click CITIZEN INVOLVEMENT from the HOME PAGE. Then click CITIZEN ACTION in the black box. Finally, click TEN STEPS YOU CAN TAKE TODAY along the left side of the page. This section provides information about how you can help maintain watershed health.

11. What is an *illicit discharge*? Why is Duluth concerned about illicit discharges?

An Illicit Discharge is the result of an illegal and/or improper waste discharge into storm drainage systems and receiving waters. The City of Duluth contains 42 creeks, 12 of which are protected trout streams. The citizens of Duluth have repeatedly demonstrated that the quality of the environment is extremely important. As such the City of Duluth has made a commitment to protect and preserve the quality of the creeks within its jurisdiction. Click on STORMWATER MANAGEMENT on the HOME PAGE. Then click on STORMWATER

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MANAGEMENT PLAN in the black box. Finally, click on **ILLICIT DISCHARGES** on the left side of the page. Scroll the information.