

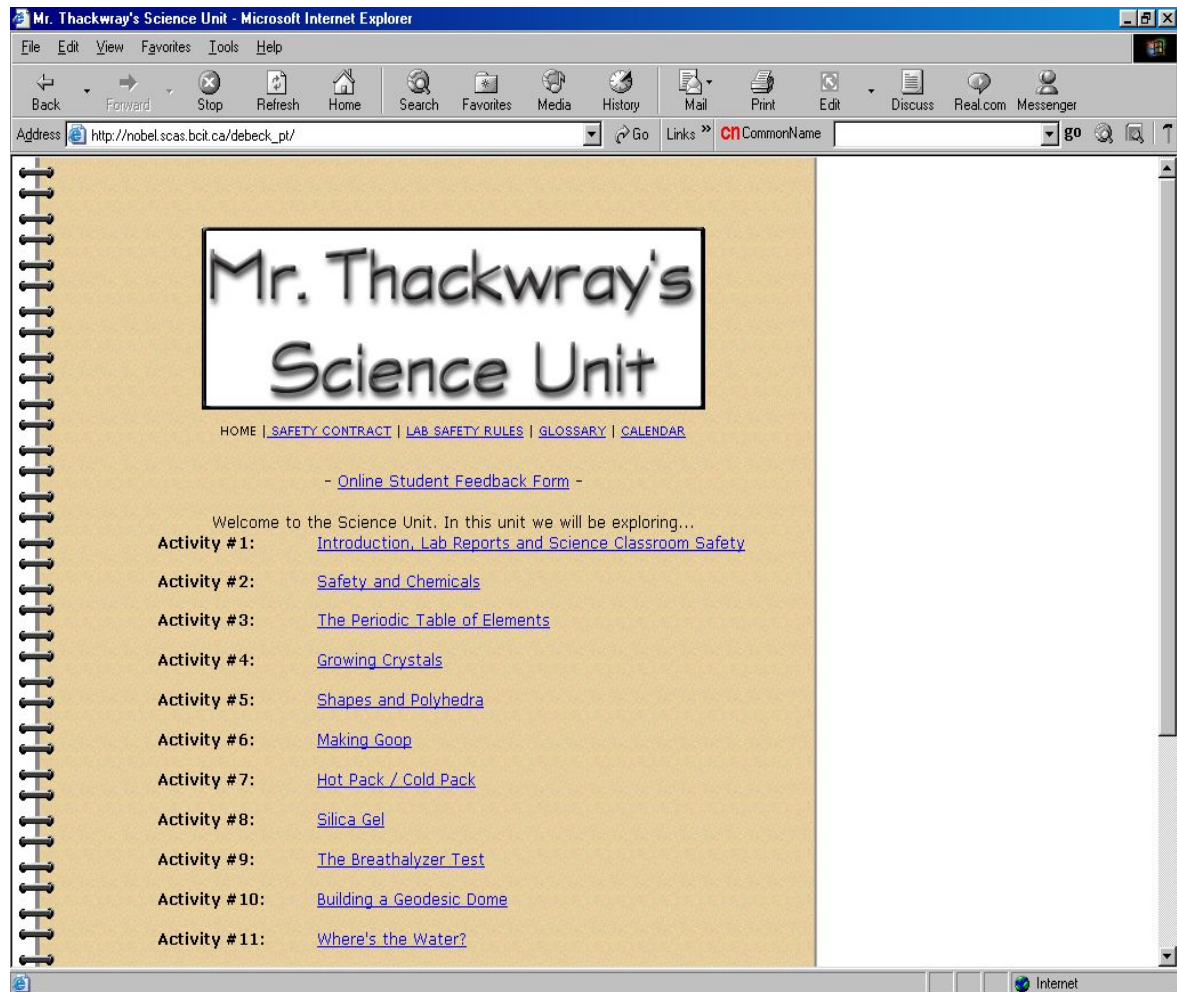
Integrating Technology into your Science Classroom

http://nobel.scas.bcit.ca/debeck_pt



- **What does this mean?**
- **Why integrate technology?**
- **Who can integrate technology?**
- **How can I do this?**
- **Conclusion**

<http://nobel.scas.bcit.ca/catalyst2003>



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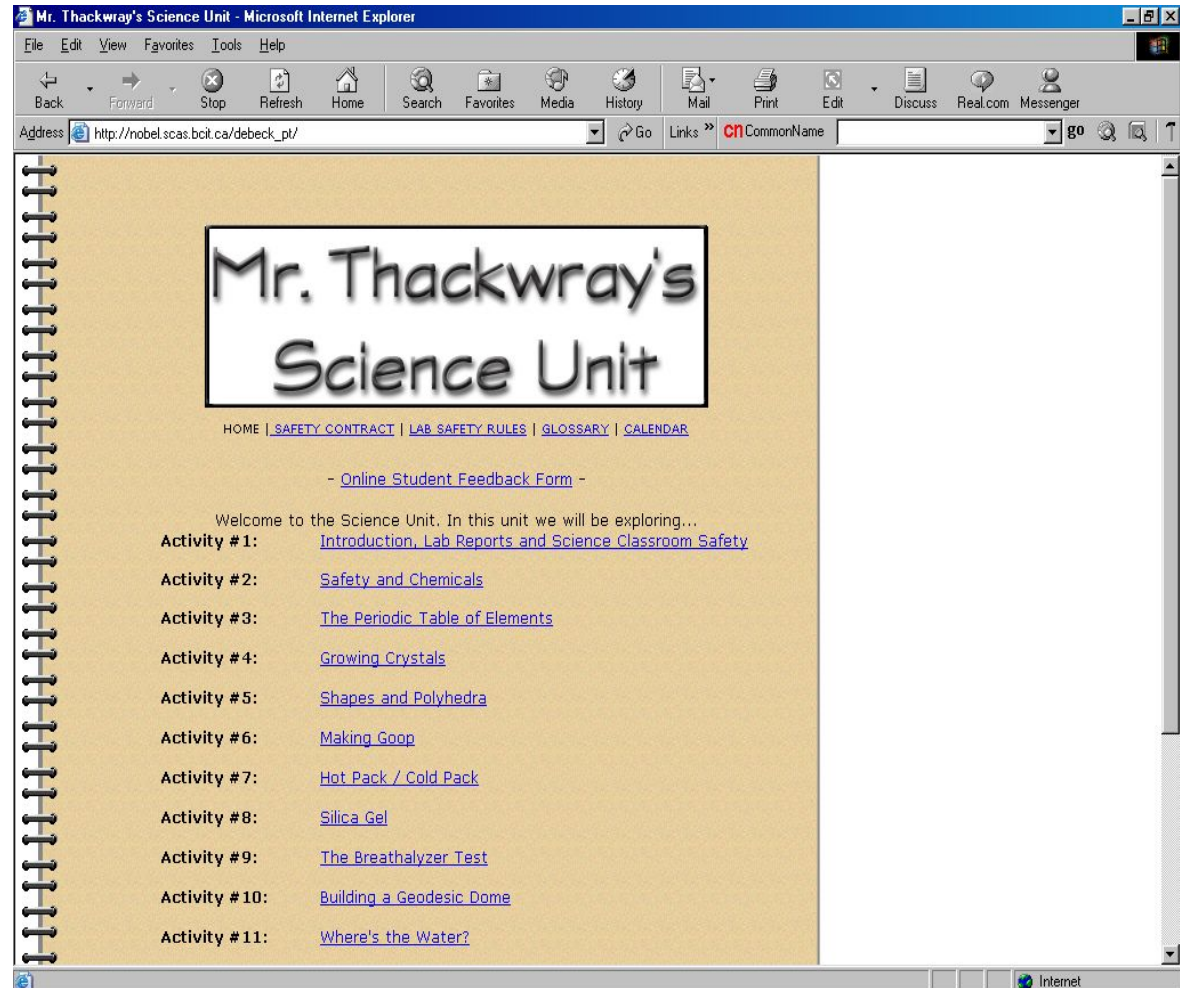
What does this mean? | Why integrate technology?

Who can integrate technology? | How can I do this? | Conclusion

What does this mean?

Integrating technology into the science classroom is a strategy used to employ the World Wide Web (WWW) and some of its many resources as an interactive tool to engage students in the curriculum.

It was prepared in response to students' enthusiasm towards using the the concept of hypermedia and the World-Wide Web as a learning tool.



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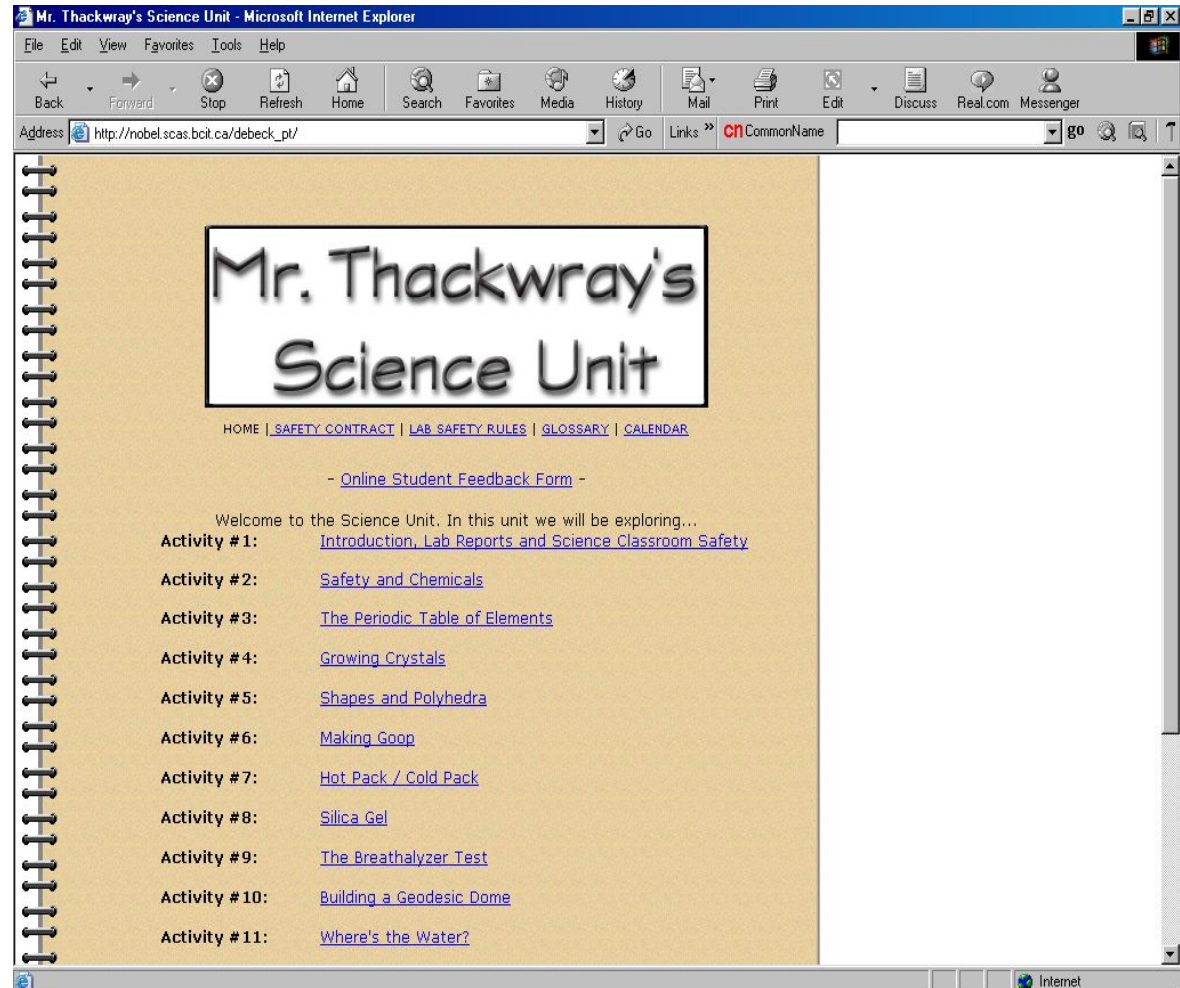


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Why integrate technology?

- have a 24-hour on-line tutoring service to improve student study habits through user-initiated learning.
- effective way for teachers to inform parents about what their children are doing in school.
- enables students to communicate to parents more effectively about what they are doing in school.
- can be very helpful for visual learners. You can use images of the actual items you are using.



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Who can integrate technology?

- anyone interested in investing a little time at the front end to save volumes of time down the road.
- if you have: a computer with internet connection, server space on which to display your site, and text writing (with some knowledge of HTML) or web building software.

YOU!
(If this guy can do it...)

The image is a composite. On the left is a screenshot of a web browser window titled "Mr. Thackway's Science Unit - Microsoft Internet Explorer". The address bar shows "http://nobel.scas.bcit.ca/debeck_pt/". The website content includes a header "Mr. Thackway Science", a navigation bar with links like "HOME", "SAFETY CONTRACT", and "LAB SAFETY RULES", and a list of 11 activities with hyperlinks. A red arrow points from the text "YOU!" to the list of activities. On the right is a photograph of a man, Mr. Thackway, wearing a white lab coat, a blue shirt, a tie, and glasses. He is smiling and standing in a classroom or lab setting, with a whiteboard and various lab equipment visible in the background.

May 3, 2003

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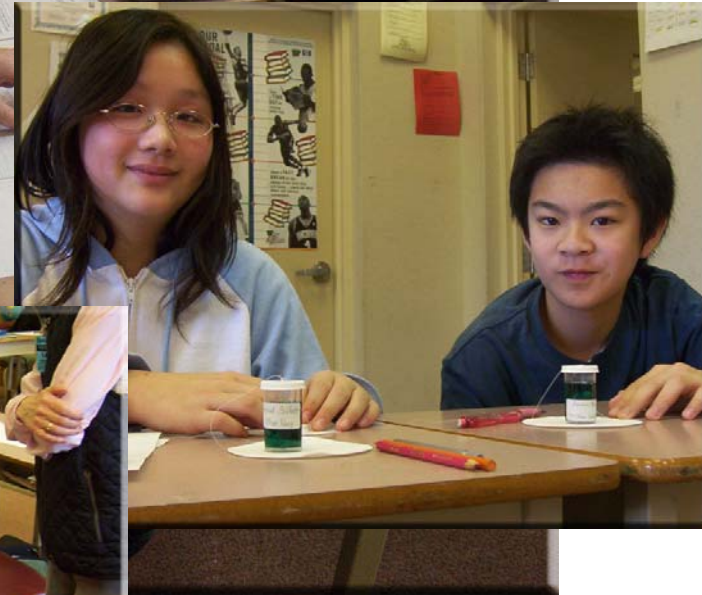
Who can integrate technology? | How can I do this? | Conclusion

How can I do this?

- Take a unit or lesson you have developed.
- Start with a simple plan or framework.
- Build from the simple.

Note:

Technology integration is not at the expense of student involvement and "hands on" learning.



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Example of a simple framework of headings:

- Ideas to be Developed
- Key Words
- Materials Required
- Procedure
- Observations
- Summary
- Questions
- WWW Links



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Ideas to be Developed

- Start with your objectives. Let the students know where you want to go with the lesson/unit.

Mr. Thackway's Science Unit - Microsoft Internet Explorer

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Address http://nobel.scas.bcit.ca/debeck_pt/ Links » CN CommonName go

Science Activity #4 - Growing Crystals

[HOME](#) | [SAFETY CONTRACT](#) | [CLASSROOM SAFETY](#) | [GLOSSARY](#) | [CALENDAR](#)

All experiments must be done in the presence of a parent or teacher.

● Ideas	● Key Words	● Materials	● Procedure
● Observations	● Summary	● Questions	● WWW Links

Ideas to be Developed

The study of crystals and their structure is a field called [Crystallography](#). A crystal is a solid that consists of the various [atoms](#), or [molecules](#) being arranged in a uniform repeating pattern based on its [unique shape](#). This results in the material having a specific shape and colour, and having other characteristic properties. Crystals may be big or little, but they all have the same "shape". Take a look at the display of crystals in the lab. Salt and sugar are examples of crystals. [Table salt](#) is NaCl and has a cube-shaped structure. [Snow crystals](#) form a six-sided structure. [Diamond](#) (used in jewelry, and cutting tools) is also an example of a crystal; it is made of pure carbon. [Graphite](#) (used in pencils and lubricants) is also a crystal made from carbon.

How are crystals grown?

In a [solution](#), a [solvent](#) (water) can only hold a certain amount of [solute](#). This is called the [solubility](#) of a solution. When the temperature of the solution is increased, hot water can dissolve more solid substance than cold water. This is because heated water molecules move farther apart, making room for more solid substance to dissolve. When no more of the solid substance can be dissolved, the solution is said to be [saturated](#). As this solution cools, the water molecules move closer together again and there's less room for the solution to hold onto as much of the dissolved solid.

Crystals begin to form and build on one another as the water lets go of the excess solute. This process is called [recrystallization](#) and, depending upon conditions, one may obtain a mass of many small crystals or one large crystal.

How do crystals form and how do we control its rate of growth?

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Key Words

- Provide important vocabulary. This will be a quick reference to assist with reading comprehension.

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Key Words

Crystal - A crystal is a solid with a definite geometric shape. The shape consists of smooth, flat surfaces that meet in sharp edges or corners.

Crystallography - A branch of Chemistry that studies crystals and their structure.

Nucleation - When solute molecules in a [saturated solution](#) encounter a dust particle or a solid surface (like a string or a [seed crystal](#)), they will tend to adsorb and aggregate on the surface. The solid surface provides the nucleation site for the formation of crystals.

Recrystallization - Recrystallization is a process that has been used to purify solid material by dissolving the solid substance in an appropriate liquid and then having the material come out of solution in crystalline form.

Saturated solution - Solution where the maximum amount of solutes is dissolved in the solvent.

Seed crystal - A starting surface for a growing crystal.

Shape of Crystal - The atoms in a crystal occupy positions with definite geometrical relationships to each other. This structural arrangement of its atoms. is uniquely defined by the chemistry of the substance and determines the shape of the crystal. In crystallography, the shapes of crystals can be grouped into seven systems:
♦ Cubic ♦ Tetragonal ♦ Hexagonal ♦ Trigonal ♦ Orthorhombic ♦ Monoclinic ♦ Triclinic
These are covered in more details in [Activity #5 - Shapes and Polyhedra](#).

Solubility - The maximum amount of solute that can be dissolved in a certain volume of solvent at a given temperature is known as the solubility of the solute. The solubility of the solute usually increases with an increase of temperature.

Solute - Dissolved substance in a solution.

Solution - A uniform mixture of two or more substances. For example, sugar dissolved in water is a solution.

Solvent - The liquid into which the solute is dissolved. The solvent of choice in this lab is water.

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Materials Required

Procedures

Observations

Summary

- The basic components to this lesson. You may have handouts that include this information.

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Materials Required

The crystals that we will be growing in this lab are:

- copper
- nickel
- sodium
- potassium

You will be assigned to grow crystals from the bottom of the solution.

Procedure

- Obtain a vial from the bottom of the solution.
- Obtain a seed crystal and make your observations.
- Cut a piece of string and tie it to the seed crystal.
- Tie the thread so it does not touch the bottom of the vial.
- Your teacher will provide a saturated solution to grow. Your teacher will assign you to grow crystals from the bottom of the solution.

Observations

- Sketch and describe the shape of the seed crystal before you add it to the saturated solution.
- After your crystals grow, describe the crystals that form on your string? Look at the shape again. How does their shape differ from the shape of sugar crystals that are on display?

Chemical name of your crystal:	Chemical name of your crystal:

Chemical name and formula of Crystal:	Chemical name and formula of Crystal:

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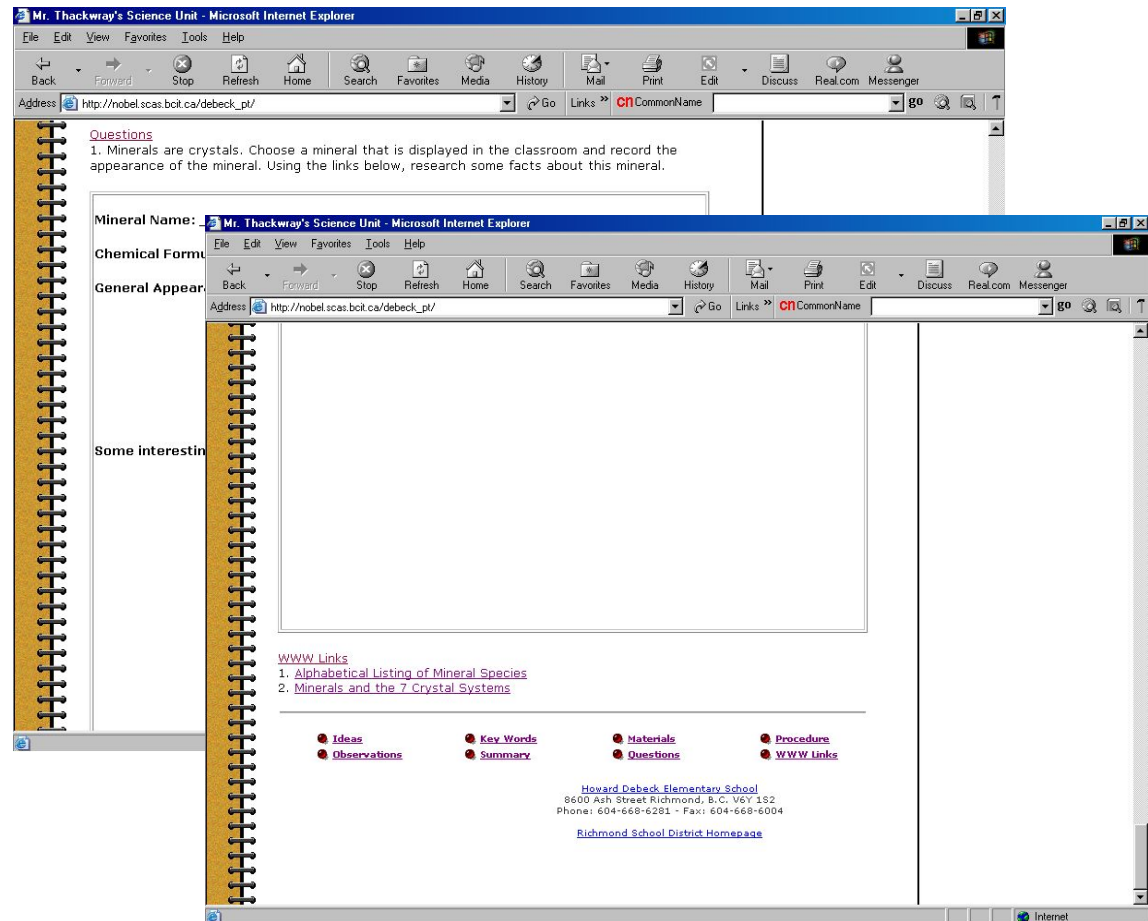
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Questions

WWW Links

- Perhaps, the most important part of the site/page. Here you challenge the students to research sites you have carefully selected, and respond to questions that reflect their understanding of the lesson objective.



The screenshot shows a Microsoft Internet Explorer browser window displaying a web page titled "Mr. Thackway's Science Unit". The address bar shows the URL http://nobel.scas.bcit.ca/debeck_pt/. The page content includes a section titled "Questions" with a prompt: "1. Minerals are crystals. Choose a mineral that is displayed in the classroom and record the appearance of the mineral. Using the links below, research some facts about this mineral." Below this, there are input fields for "Mineral Name:", "Chemical Formula:", and "General Appearance:". A large text area labeled "Some interesting" is also present. At the bottom, there are "WWW Links" including "1. Alphabetical Listing of Mineral Species" and "2. Minerals and the 7 Crystal Systems". A sidebar on the right contains links for "Ideas", "Key Words", "Materials", "Procedures", "Observations", "Summary", "Questions", and "WWW Links". The footer of the page provides contact information for Howard Debeck Elementary School and the Richmond School District.

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Conclusion

The important thing is to **get started**. There are many resources available to assist you with your web page development - just give it a try.

