

INTRODUCTION

The primary mission of the Davistown Museum is the study of tools - who made and used them, when and how they were made and used, and how they have changed. Museum founder and curator Skip Brack is convinced that “hand tools provide an opportunity to learn about local, regional, and American history. A study of the edge tools* and other hand tools used and made by Maine and New England ship carpenters, coopers, blacksmiths, and farmers provides a unique way to illustrate and understand the evolution of the Industrial Revolution and its impact on the society in which we live.” This is the approach of the Davistown Museum, offering a fascinating and rarely used window into history, science, culture, and economics. ***Tools Teach*, the first print and on-line publication in the museum’s education component**, opens that window for teachers and students. It presents resources and ideas for teaching and learning about tools, technology, simple machines, American history (with a focus on Maine and 19th-century rural/coastal New England), and how they all relate. Skip’s areas of interest and expertise include tools and their history and Maine/New England history; mine is literacy education, and one of my museum hats is director of education. We have joined forces to create the first offering of the museum education component.

I compiled and annotated a list of books and non-print resources and suggested activities to supplement them. Skip contributed editorial input and put together tool kits around which to center *Tools Teach*. The books and tools illustrate some of the main topics covered by the Davistown Museum: 19th-century hand tools—particularly edge tools*—used in Maine villages along and just inland from the coast and the history of that area leading up to the Industrial Revolution and beyond. *Tools Teach* is the first part of the museum education component to be completed and is geared to teachers interested in exploring tools as a pathway into history and science. It can be used in conjunction with a visit to the museum, but can also be used on its own. The second part, not yet available, is directed at student visitors to the museum and website, offering information and using museum resources directly.

Tools Teach includes a section geared toward preschool-primary teachers and students and one for the middle-secondary level, although, of course, users might draw from either or both for any age. I don’t call what I offer “lesson plans,” since I don’t make sequenced suggestions for a specific curriculum. Instead, I have gathered, listed, and annotated books and other resources that would facilitate the study of tools/technology, 18th and 19th century New England/American history, and the physics of simple machines. I also suggest activities to use in conjunction with, or separate from, the books and covering all content areas. The resources can stand alone or be used as supplements to others, e.g. a section in a science text or a unit on Maine/U.S. history. Skip has

put together tool kits to complement the books and other information. We trust users to navigate the information, choosing and using whatever suits their purposes, however they see fit.

Each section of *Tools Teach* centers around a book that depicts people using hand tools in ways and locations characteristic of 18th-19th century rural New England. For the preschool-primary section, it is [Mr. McGill Goes to Town](#), a picture book by Jim Aylesworth. Eric Sloane's classic, [Diary of an Early American Boy](#), is the main book for middle-secondary students. Each central book is accompanied by a list of other books and resources that explore the history of tools from prehistoric to contemporary times, with a focus on simple machines. I annotated each of the supplementary books and suggested ways in which they can be helpful and how they relate to the main book. I offer activities that can grow out of the study of the books or stand alone. I explain where the books can be found and mention problems in the books and ways to deal with them. I have also included an annotated list of non-print resources, with addresses of relevant websites and links to them on the web version. There is an appendix with resources from the museum and web sites and samples from the books cited. I plan to align the activities with the Maine Learning Results, which are similar to national and other states' learning standards, and I will post the results on the web version and include them in the next edition of the print version.

Mount Desert Island 8th-grade teacher Steve West's project offers an example of how these resources can be used with exciting results. Steve used our offerings to explore U.S./Maine history and the Industrial Revolution, combined with the study of chemistry via metals. He provided students with a set of tools, spanning 200 years of tool making and development, loaned from the Davistown Museum. He used the tools as a "jumping-off point for research on the technological developments of tools, changes in steel production, chemistry of the different alloys used, and the industrial revolution in New England." ([West, appendix](#)) His students used books loaned from the museum and the laptop computers, given to all 8th-grade students in Maine, for their research and final projects. They presented their findings as Appleworks slide shows. [Steve's project](#) is in the appendix, and a letter from Steve explaining his use of Davistown Museum resources, is also in the appendix in [Who We Are](#). We hope to post the results of his project on our website.

We look forward to adding experiences and projects that result from the Davistown Museum education component. Please contact me at judith@davistownmuseum.org with questions and send me anything you would like to share that results from or relates to *Tools Teach*.

Representative **TOOL KITS** AND ALL THE **BOOKS IN OUR BIBLIOGRAPHY** ARE **AVAILABLE FOR LOAN**. THEY MAY BE BORROWED BY SCHOOLS OR INDIVIDUALS. IF YOU ARE INTERESTED IN BORROWING A KIT AND/OR

PRINT RESOURCES, PLEASE CONTACT judith@davistownmuseum.org .
Books are also available from the Ivan O. Davis Liberty Library for those who live in the museum area or through interlibrary loan for those not near Liberty.

Many of the books listed in this publication are available from Amazon.com. If you choose to order the books that I suggest, or any other books, from Amazon.com, you can **HELP SUPPORT THE DAVISTOWN MUSEUM** by ordering through our website. A small percentage of your Amazon.com order will go to the Davistown Museum, if you go to their website from ours. Simply click on any Amazon.com button on our website or type in the name of a book in the Amazon screen on our home page and hit "Go." Thank you. We appreciate your help in supporting our website.

** For those unfamiliar with tool vocabulary, edge tools are those which are made to cut, e.g. axes, planes, chisels, etc.. They have to have special edge, with harder and higher quality steel than that used for other tools or the rest of the edge tool.. Their production involves an understanding of and expertise in the chemistry of iron-making.*

TOOLS TEACH:

Learning the World through the Study of Tools

Part I: Preschool-Primary Section

FOCUS BOOK:

Aylesworth, Jim. (1989). *Mr. McGill goes to town*. Henry Holt and Company, NY, NY.

OTHER BOOKS TO USE WITH/WITHOUT THE FOCUS BOOK:

Glover, David. (1997). *Levers*. Rigby Interactive Library, Chicago, IL. .

Glover, David. (1997). *Pulleys and gears*. Rigby Interactive Library, Chicago, IL. .

Glover, David. (1997). *Ramps and wedges*. Rigby Interactive Library, Chicago, IL. .

Glover, David. (1997). *Screws*. Rigby Interactive Library, Chicago, IL. .

Glover, David. (1997). *Springs*. Rigby Interactive Library, Chicago, IL. .

Glover, David. (1997). *Wheels and cranks*. Rigby Interactive Library, Chicago, IL.

Mandell, Muriel. (1968). *Physics experiments for children*. Dover Publications, Inc. New York, New York.

PICTURE BOOKS ABOUT TOOLS:

Awan, Shaila. (2000). *My toolbox*. Dorling Kindersley, NY, NY. .

Grimes, Nikki and Bryan, Ashley. (1999). *Aneesa Lee and the weaver's gift*. Lothrop, Lee and Shepard Books, NY, NY. .

Jeuness, Gallimard and Delafosse, Claude. (1999). *Tools: A first discovery book*. Scholastic Inc., NY, NY. .

Klitting, Lars. (1995). *Beaver the carpenter*. Douglas & McIntyre, Vancouver, Canada.

FOCUS BOOK:

Aylesworth, Jim. (1989). *Mr. McGill goes to town*. Henry Holt and Company, NY, NY.

Description/Annotation:

I chose *Mr. McGill Goes to Town* as the **centerpiece** for this unit after a long search for an appropriate picture book that met my criteria. The criteria included quality, attractive literary and artistic components, characters correctly using tools typical of the late 18th and 19th centuries, a rural setting that could be Maine, and evidence of simple machines in the pictures. This book fits the bill on all counts. It's a charming cumulative rhymed story, which the children with whom I've "tested" it enjoyed predicting and reciting after a few verses. "The blocky, cartoon-style illustrations done in warm, crayon textured colors are lively, amusing and suit the laborers well" (School Library Journal).

The story takes place in a rural, probably New England, community (note the stone walls). Mr. McGill wants to go to town for the fair, but needs help repairing his mill. He seeks help from a neighbor who agrees to help him if Mr. McGill first helps him cut his hay. But they need help with that and it's on to the next neighbor. They and the subsequent neighbors are all engaged in 19th century livelihoods that involve hand tools and simple machines (water wheel, scythe, level for the stone wall, wagon wheel, lever, hammer, and clamp). I have worked with a group of children from 3-12 years old around the nicely developed theme of collaboration in the story with excellent results. With or without the Rigby series on simple machines, children can learn a great deal about history, tools/technology, and physics from reading and talking about this book. I've included ways to include all of the other content areas as well.

Where to find the book:

Unfortunately, the book is no longer in print. I first got it through interlibrary loan after a colleague recommended it, and I then found copies on Amazon.com (www.amazon.com) and eBay's Half.com. (<http://half.ebay.com>). The prices vary widely, so just keep checking till you find a reasonable price. The paperbacks were reasonable, the hardbacks unreasonable, so I got paperback and laminated one for safe-keeping. **Please note: you can help support the Davistown Museum if you go to our web site www.davistownmuseum.org and order from Amazon.com via our site. All you need to do is click on an Amazon.com icon next to one of the books or type in the name of ANY book in the screen on the home page, which will take you to their website and give the museum a percentage of the purchase price.**

Problems:

I would have loved to have more women in the story. There are none except in the last scene when the men get to the fair and two women are dancing in the

distance... and it's white males all the way. There may have been few women working at the jobs covered in that setting, but women of the period worked the fields, helped build the stone walls, were coopers, and weavers and did most everything that needed doing when men weren't around. I'd have gotten them in somewhere if I'd written the book, but I didn't. Consequently, it would be important to talk about the roles of women and where they might have fit and to discuss their absence and what it means about our culture now and then. The girls, ages 3-11, with whom I've read it, have found the book engaging and entered into the discussions and activities readily and with great success, in spite of the lack of women characters.

Suggested activities:

Social Studies

Discuss how life in the rural 19th century New England setting of the story was similar to and different from contemporary life.

- Tune in to and be led by the students' observations/questions. For example, when I read and discussed this book and did activities based on it with a mixed age group (pre-middle school), we spent quite a while discussing the stone walls in the story, the ones we see in our community, and how and why they got there. Since they weren't yet aware of them, the younger children were looking forward to finding them near their own homes. This was in Maine, and many New England states still have stone walls in rural areas. If your area doesn't, you could talk about why not.
- Ask students to list the different jobs that they see the people doing in *Mr. McGill Goes to Town*. Ask if people still do any of the jobs in the book. For example, ask them to look around and see what they see or what they remember about farms today. How, for example, do farmers bale hay compared to the bales in Mr. McRae's field?
- Talk about the tools that the students see the characters using. Discuss which we still use now, which we no longer use, and why they are no longer used or still used. You might talk about the history of a specific tool. See the section that suggests [cross-curricular activities around hammers](#).
- Ask students to choose a livelihood that someone in their area might have had in the early nineteenth century, similar to what they see in *Mr. McGill*. Have students research the livelihood chosen, working individually or in groups and (see activity in [Language Arts/Computer Literacy](#)) sharing their results.

For example, in the Liberty area, there were many coopers who made barrels like the wooden bucket in Mr. McRae's field. There were also blacksmiths, farmers, woodworkers (some of whom worked on boat building), millwrights, wheelwrights, and others. They might ask

grandparents or other senior citizens in your community what they remember people doing when they were little or what their grandparents or great grandparents did. For the Liberty area, you could visit the Davistown Museum and/or website and contact the Liberty and Montville Historical Societies. Outside the museum area, students could contact local historical societies. They may have information on and photos of people engaged in various trades in the 19th century and using tools/machines to do the work.

Arrange for students to visit blacksmiths, carpenters, or someone involved in one of the other trades in *Mr. McGill*. They might also visit a boatbuilder; while there are none in *Mr. McGill*, they were important in 19th century Maine and use tools in the Davistown Museum collection. Ask them to compare what they find to the way the trade was done in the 19th century. Have them make a chart to compare and exhibit the differences and similarities. In the Liberty area, Mike Beaudry, author of *The Axe Wielder's Handbook*, built his own home with hand-hewn timbers and offers demonstrations of his trade; his e-mail is mudpond@midcoast.com. The Atlantic Challenge Foundation Apprenticeship in Rockland has a workshop and programs in shipbuilding; the contact there is K.C. Heyniger, kch@atlanticchallenge.com. John Sundberg, a Davistown Museum board member, practices blacksmithing and is a member of The Ancient Ones, a Maine 1640-1840 reenactment group that demonstrates blacksmithing in period costume is a good resource for finding blacksmiths in Maine. Another helpful resource for finding blacksmiths and information is ABANA, The Artist Blacksmith's Association of North America, Inc. at www.abana.org. The Ivan Davis family in Liberty has been involved in making barrel staves for many years.

- **Maine History:** Look at the wooden bucket in Mr. McRae's hay field, and discuss containers then and now. Barrels, similar to the bucket, were the major containers for many commodities in the 19th century. Many were made in the Liberty area and were then shipped around the world, carrying commodities such as molasses, wine, rum, water, salt, and fish oil, in ships built nearby. They were also important as trade items for the West Indies and other destinations.

Physical Science

- Read and talk about simple machines. [The Rigby series on Simple Machines](#) is a good place to start. See also the [activities related to simple machines](#) that follows the Rigby series annotations. If you have access to computers, I highly recommend the wonderful, interactive section of the Edheads website on simple machines at <http://www.edheads.org/activities/simple-machines>. Discuss how simple machines make work/life easier. Search with students for tools and

examples of simple machines in the illustrations. For example, we found levers and wedges (inclined planes) in every incident in *Mr. McGill*, as the characters worked on each task. See the [illustration in the appendix](#) for an example.

Physical Science /Social Studies

- Point out Mr. McGill's water wheel. Discuss the idea of water power and its evolution to our current sources of power. The first edition of Macauley's *The Way Things Work* has a good two page spread on "the wheel and axle at work," on p. 36-7 that juxtaposes an overshot waterwheel on one page with a hydroelectric turbine on the next. You might also discuss Mr. McNeil's wheel, how wheels have changed and remain the same, and their importance to our culture and previous ones.

.Language Arts

- The children with whom I've read *Mr. McGill* enjoyed the cumulative tale, with its repetition and rhyme. They loved reciting the repeated words/phrases when I paused (or even when I didn't!).
- Since collaboration is an important theme in *Mr. McGill*, you might have students talk about collaboration and what a cumulative tale is, and then have them write a cumulative tale collaboratively. They might write one that takes place now, with someone needing help with a project and going from person to person till all collaborate to get the tasks done. This works well with students brainstorming the story and then each contributing an episode. I've done a similar writing/drawing activity after reading Ashley Bryan's *It's a Wonderful World* with first graders with ... well, wonderful results.
- **Language Arts/Social Studies/Health Education:** In discussing/writing the cumulative tale, the activity suggested above, you might talk about the differences/similarities then and now in terms of community. Collaboration is a major theme in *Mr. McGill*. Talk about what that means and how it is evidenced in the story. You could discuss self-sufficiency and interdependence issues then and now, asking if workers now would be able to or need to leave their workplaces as the characters in the story did. You might use the writing of the cumulative tale as an example of collaboration and discuss what the students perceived its advantages and disadvantages to be.
- **Language Arts/Computer Literacy:** Have students write about what they learned about the livelihood they chose (see [Social Studies activity](#) above) to share with classmates. Groups could choose one livelihood and pool what they find. Students could produce an album or Power Point presentation that shows what they learned of the work that people did in your area in the 19th century. Students might share their results with

another class, post it on their class/school web page, send it to us at the Davistown Museum via snail mail, or arrange with us to post it on our website or to link to it. My experience has been that sharing and publishing provide important incentives for students, offering them a sense of pride and accomplishment that doesn't come from "writing for the teacher."

Art

- Students with whom I worked enjoyed drawing pictures based on the story or on their lives in relation to the topics in the story. I didn't suggest that they do so, but it grew out of their experience of the story and led to more great discussion.
- Suggest that students draw something in their lives that reminds them of the simple machines that they've learned about and/or that appear in *Mr. McGill Goes to Town*, e.g. a bicycle, wagon. Discuss the simple and complex machines involved.
- Students with whom I worked enjoyed making machines/sculptures with objects that I gathered in our used tool stores and around our house and workshop. See the activity described in detail in the [Suggested Activities section of the Rigby Simple Machines series annotation](#).
- Have students make collages out of pictures of simple/complex machines cut out of magazines and catalogs or that students draw. This is a good activity to do as a group, with the result posted on a wall or bulletin board, but also works well as an individual project. Ask students what kind of simple/complex machine they used to make the collage. (Hint: what do they use to cut out their pictures?)
- **Art/Science:** Discuss the tools that artists use. Visit the Davistown Museum and/or its website for examples to discuss. There are many [sculptures](#) made with tools of the trade/craft e.g. glassblowing, welding, carpentry, as well as [sculptures made out of tools!](#) Suggest that when students do an art project they be aware of the simple and complex machines they use, such as the scissors they might use for the collage above.

Math

- Students with whom I worked enjoyed practicing "scientific observation" by finding things that appear often in the illustrations, e.g. Mr. McGill's dog, hammers, stones. You might have them count these things or others as they appear in the story.
- More ambitious and knowledgeable teachers than I might incorporate the simplest mathematics concepts involved in the physics of simple machines.

Cross-curricular Activity

You can use specific **tools as vehicles for learning** in many content areas, e.g.

HAMMERS

- **Social Studies:** Explain to students that hammers are the oldest tool used by humans and that even animals use hammer-like tools. Research the history of hammers. See how many hammers students can find around them, both hammers people made and other forms such as stones, at home and other places, used by humans and/or by animals. Ask if/how they are similar to the ones in Mr. McGill? Discuss whether they are used for the same things.
- **Science:** Discuss hammers as simple machines, as levers, and the physics of making it possible to do jobs that would otherwise be difficult or impossible. If you have access to hammers, from the Davistown Museum collection or other sources, you might let students examine them to help them think about this and talk about the differences between the old, blacksmith-forged tools, and the more modern cast hammers. You could talk about how tools were made in Mr. McGill's time, how they are made now, and how they are similar and different. You might also touch on the chemistry of iron/steel. [A Visit to the Ironworks](#) is a narrative about two 17th century American children who accompany their father to the nearby ironworks and describes the process of taking iron from ore to bars and iron pots.
- **Language Arts:**
 - **Compare and contrast:** Are there different kinds of hammers? If so, **list &/or draw** them and describe how they are different. Make a chart of similarities and differences. Ask students why think they are different? Have them describe the tasks that hammers help perform? Using the chart and discussion, have students write about what they now know about hammers.
 - Students might enjoy **writing a story** about the life of a hammer that has existed from Mr. McGill's time to now, describing what it does and who it encounters in each generation. They might write it as a diary from the point of view of the hammer, as it moves from its origins, perhaps in a 19th-century forge somewhere nearby, to its current status, maybe used by a boat builder at the Apprentice Shop in Rockland or rusting in a shed behind someone's house. Suggest that they tell about who's owned it, what it has been/is used for, its feelings about what it helps to create. We have hammers in the museum that were in families and used for hundreds of

years. Younger children could dictate their story. Older children could take theirs through a writer's workshop process from brainstorming through publication, with our website as a possible publisher.

- **Art:** Make a piece of art using a hammer, either as a tool or material in the piece.
- **Math:** Count the hammers in *Mr. McGill Goes to Town*.

OTHER BOOKS TO USE WITH/WITHOUT THE FOCUS BOOK:

Simple Machines series:

Glover, David. (1997). *Levers*. Rigby Interactive Library, Chicago, IL.

Glover, David. (1997). *Pulleys and gears*. Rigby Interactive Library, Chicago, IL.

Glover, David. (1997). *Ramps and wedges*. Rigby Interactive Library, Chicago, IL.

Glover, David. (1997). *Screws*. Rigby Interactive Library, Chicago, IL.

Glover, David. (1997). *Springs*. Rigby Interactive Library, Chicago, IL.

Glover, David. (1997). *Wheels and cranks*. Rigby Interactive Library, Chicago, IL.

Description/Annotation:

The Rigby Simple Machines series of six books includes one each on levers, pulleys and gears, ramps and wedges, springs, screws, and wheels and cranks. I love these books and children do, too. The books are geared for primary school, but I learned or relearned some physics concepts from this excellent series.

Each book begins with a two page "What are....?" spread with clear, simple explanations for each machine, excellent illustrations, and important vocabulary highlighted and labeled on the illustrations. The subsequent 20 pages or so follow the pattern of simple explanations, accompanied by illustrations from everyday life and history. Here's what it says on the back of *Levers*:

- How are wheelbarrows, can openers, and bicycle brakes alike?

- Why is it easier to hold a bolt tight with a pair of pliers than with your bare hands?
- Why is it easier to bite a carrot with your back teeth than your front?
- Why is a seesaw considered a machine?

Levers answers these questions and shows you how different kinds of one simple machine are all around you to make your work and play easier.

Each two page spread has a “fact file” box that offers definitions, historical snippets (e.g. Archimedes and ancient galleys), and answers to the above questions. Topics covered in *Levers* include: Openers, wheelbarrows, tools, balances, rods and oars, et al. There is a short glossary, as well as index and suggested reading at the end of each book.

In this series, the illustrations tend to be either gender and race neutral or feature females, males, and people of different races and ages doing the tasks illustrated. They offer a contrast to the strictly white male characters in *Mr. McGill*, and one might ask students to note and discuss the difference between the books.

Problems:

There is **no book or section** in each book in the series **that explains the concept of simple and complex machines in a general way**. I would have liked one. The series is titled “Simple Machines,” but in none of the individual books is there a discussion of exactly what simple machines are, how they move the world, singly and in combination, and how the book’s topic fits that larger picture. There is, for example, a book about ramps and wedges and one about screws, but nowhere is there any mention that both are examples of the inclined plane and what that is. One would need to put together an explanation from other sources or from one’s own knowledge to pull the concepts of each book together. See the annotations of the middle-secondary level books; much of the information in these books could be easily adapted for use with pre-school/primary age children. The online resources cited also offer help with introducing the general concept of simple machines. I find the glossary from the Edheads website to be **one of the best explanations of simple and complex machines and of the different types**, e.g. it defines and illustrates an “inclined plane” and then explains that a “wedge” is “two inclined planes joined back to back” and a “screw” is an inclined plane wrapped around a shaft or cylinder.” My only concern with that information is the order in which it is presented; since it’s a glossary, the terms are listed in alphabetical order, so the definition of simple machines doesn’t come till toward the end and “complex machine” is the first in the list. If/when I have time I would like to take their information and rearrange it in an outline format with simple machines as the main topic. Also, check the other resources listed below.

Where to find the books:

This series is available at www.heinemannlibrary.com/spring2003/simple-machines.asp

Suggested activities:

These books pair nicely with *Mr. McGill Goes to Town* (I've mentioned tie-ins with each activity), but can be used on their own, with other books (see some suggested titles in the bibliography), individually, or as a series.

- **Physical Science:** Children might go through each book, find, and use/experiment with examples of the simple machines being discussed e.g. while reading *Levers*, one might use a lever to lift a load, pull a nail out with a claw hammer, or open a bottle with a bottle opener (if you happen to have a bottle without a screw top... if not, you can always use the screw top bottles when you do the screws book). The levers experiment from the Marvelous Machines website is excellent. The Simple Machines Learning Site at www.coe.uh.edu/archive/science/science_lessons/scienceles1/finalhome.htm also suggests experiments to illustrate how simple machines work. The characters in *Mr. McGill Goes to Town* are using a lever when they fix the wheel and mount it on the wagon.
- **Physical Science/Math:** Have students find examples of simple machines around them. Counting, listing, and contests for more than one child are fun. This is a good activity for car/bus trips, a welcome variation on the "I Spy" or license plate games. Students might compare the number of each kind of machine they see and discuss which are more evident and older students might discuss ratios and make charts and/or graphs.
- **Physical Science/Art:** After reading the story, discussing simple machines and the collaboration aspect in the story, the children with whom I've worked, have enjoyed [creating their own complex machines from simple machine parts](#) that I collect in our tool stores and house. Working in collaborative, multi-age teams has yielded excellent results for children with whom I've done this activity, but it works equally well when one student creates a machine, as we invite children to do when they visit the Children's Corner of the museum. I suggest that they can make a machine that does something, is a sculpture, or a combination of the two. In the museum, there are bins for "wheely things" (spools, washers, anything small that could function as a wheel, as well as possible axles), "inclined plane things," "screwy things," "connecty things" (rubber bands, twist ties, string, wire, etc.), and "leverish things." Once completed, we talk about what we've done, what simple machines it uses, how it works, what we might change if we did it again, and, if done in a group, how the **collaboration** worked. Students could

also write (**Language Arts**) about their process in the project above and the final result. They could compare what they've done to other machines they see around them. In the museum (on site as well as on line), we invite visiting children to explore the many examples of simple and complex machines in the tools and in art that uses them in various ways. Websites offer examples and suggestions for inventing and creating machines. For machines as art I love: <http://www.cabaret.co.uk/start.htm>, the page for a museum of automata, which is a kind of mechanical sculpture; there are animated examples and suggestions and resources for making automata. Another site that is fun and links to numerous other sites is "The Amazing Web Page of Alexis Great links on Science, Rube Goldberg, and other fun things" at <http://www.geocities.com/EnchantedForest/Cottage/6102/>. Alex is a 12 year old boy who has won a Rube Goldberg invention contest, and his site takes the visitor to numerous other websites that give ideas and suggestions for making machines and inventions.

- **Physical Science/Social Studies:** Students can explore and examine tools to see how and why they work and make our lives easier and more efficient. **We offer kits of early and more contemporary tools for loan for students to examine and compare to those they see around them.** We have wooden tools and wooden animal tools for exploration in the museum. Depending on the age of the child, either wooden or actual small tools in a kit provide unlimited and entertaining learning experiences.
- **Language Arts:** For these or any of the books, children or their adults, can make and solve word search, crossword, and other kinds of puzzles. I use and love <http://puzzlemaker.school.discovery.com/> to make all kinds of puzzles. All you need to do is type in the terms you want to use, and the puzzlemaker makes a printable puzzle for you and generates the answers. There are programs that do this, but if you don't have access to one, there are a number of free sites online, such as the one mentioned above, that will generate puzzles. I have *included two puzzles* that I've generated. Feel free to download and print them from our website, and we would love to add your creations, if you send them to me at judith@davistownmuseum.org.

Other Helpful Resources:

For more information about the trades in *Mr. McGill* and/or simple machines, many of the **resources in the middle/secondary unit** could be used either as is or adapted for any age.

TOOLS TEACH:

Learning the World through the Study of Tools

Part II: Middle-Secondary Section

FOCUS BOOK:

Sloane, Eric. *Diary of an Early American Boy: Noah Blake, 1805*. New York, New York: Ballantine Books. (1965)

OTHER BOOKS TO USE WITH/WITHOUT THE FOCUS BOOK:

Challoner, Jack. *The Visual Dictionary of Physics*. New York, New York: Eyewitness Visual Dictionaries, DK Publishing, Inc. (1995)

Kalman, Bobbie. *The Blacksmith*. New York, New York: Crabtree Publishing Company. (2001)

Kalman, Bobbie and Brady, Deanna. *The Woodworkers*. New York, New York: Crabtree Publishing Company. (2001)

Lafferty, Peter. *Force and Motion*. New York, New York: Eyewitness Books, Dorling Kindersley. (2000)

Macaulay, David. *The Way Things Work: From Levers to Lasers, Cars to Computers—a Visual Guide to the World of Machines*. Boston, Massachusetts: Houghton Mifflin Company. (1988)

Hawkes, Nigel; Jackson, Mark; and Pipe, Jim, Eds. *How Science Works*. Brookfield, Connecticut: Copper Beech Books. (2001)

FOCUS BOOK:

Sloane, Eric. *Diary of an Early American Boy: Noah Blake, 1805*. New York, New York: Ballantine Books. (1965)

Description/Annotation

Unlike my long search for a book around which to organize the preschool-primary unit, finding the unifying element for the middle/secondary unit was close to a no-brainer, a “right-in-my lap” find. I investigated other titles, but found none better for my purposes than Eric Sloane’s *Diary of an Early American Boy: Noah Blake, 1805*, which had a prominent place in our library, along with his many other wonderful books about woodcraft and tools. It met and exceeded my initial criteria: **characters correctly using tools typical of the late 18th and 19th centuries, a rural setting that could be Maine, and evidence of simple machines in the illustrations.** Before I made my final decision, though, I field-tested it on a home schooling friend, and he loved it (his mother told me that she found it on the floor by his bed several nights after he’d fallen asleep reading). The day I gave the home schooler the book, a man saw it under my arm and stopped me to exclaim how *Diary* had been his very favorite book when he was young and he still loved it. Since then, numerous adults, including some teachers, have told me how important the book was to them when they were Noah’s age or younger. I would guess that some of the appeal is that, at 15, Noah works alongside his father as an equally contributing member of the family team. Among the aspects that I find appealing are the 15-year-old narrator, with whom readers can identify and compare their lives, and the exquisite drawings and text that provide engrossing, accurate pictures of 18th and 19th century New England rural life, the tools used in that era, and simple machines. These offer excellent jumping-off points for learning about the period, tools/technology then and now, and simple machines. The description from the hardcover book’s flyleaf gives a good sense of the book and its value:

Not long ago, Eric Sloane was exploring an ancient house and came upon a small, leather-bound, wood-backed volume bearing the flyleaf inscription:

NOAH BLAKE, my book

March the twenty fifth,

Year of Our Lord 1805

Given to me by my Father Isaak Blake

and my Mother Rachel

upon the fifteenth year of my life.

Eric Sloane became fascinated by the diary, in which Noah Blake kept an account of daily activities on his father's farm. In March, Noah helped to fell an oak tree for a "good wood floor" to take the place of the hard earth which had to be pounded and swept smooth every day. For a week in April, Noah worked at maple-sugaring; the rest of the month was devoted to nail-making (which was his father's trade), building a new bridge across Red Man Brook, and spring plowing. On Rogation Sunday, in mid-May, Noah and his family followed the custom of walking the boundaries of their property, both to give thanks and to take inventory.

While Noah Blake made note of his chores and of his "social activities," he did not, of course, describe in detail the house he lived in, the methods and implements he used to accomplish his work, or the reasons why certain customs were observed in his world. Eric Sloane therefore decided to fill in these details from his own knowledge of early American ways and tools, and to illustrate, with his superb pen-and-ink drawings, what the farm looked like, how things were done, and what they were done with.

The result is an intriguing combination of elements—quotations from Noah Blake's diary, Eric Sloane's descriptions of nail-making, bridge-building, shingle-splitting, and other everyday occupations of a century and a half ago, nearly a hundred illustrations—which bring the year 1805, and Noah Blake, to life again for us.

I've chosen to focus on Chapter 3, a hard decision to make. The entire book is excellent, but I thought that teachers in traditional schools might need to compress it to fit it into a school year's time constraints. I chose Chapter 3 because it discusses and illustrates the farm forge and nail-making and traces the construction of a bridge, offering many opportunities to find and discuss how simple machines and iron were used and made. We are introduced to Noah's love interest, Sarah Trowbridge, in this chapter, and its development provides a story for those less interested in tools and technology and made Noah come alive for me.

I also recommend the following pages for expanding knowledge about the period and comparing it to today, some of which are included in the appendix:

- p. 9: illustration comparing Noah's axe with a modern poll-axe;
- p. 30: illustrations of the process of making a barrel (cooper, a trade practiced by many families in the Maine coastal/Liberty/Montville area in the 19th century);
- p. 36: illustrations/descriptions of waterpower, mill wheels;
- p. 53: fascinating illustration of a waterpowered sawmill, a study in the efficient use of the principles of simple machines;
- p. 58: illustration of the development of the wheelbarrow (time line from 1600–1750);
- p. 75: illustration showing the forerunners of present-day bubble levels;
- between pp. 80 and 81: a four-page foldout with illustrations of the Blake farm in 1790 and again after 1805;

- pp. 8 and 35: illustrations that show Noah's mother, Rachel, performing tasks—sweeping designs onto the floor and helping to operate the quern, a simple hand mill that ground grain.

Where to Find the Book:

Alas, this book is out of print. There are copies in many libraries, and I found some available from Amazon.com (www.amazon.com) and eBay's Half.com. (<http://half.ebay.com>). The prices vary widely, so just keep checking till you find a reasonable price. The paperbacks tend to fall apart, so I recommend holding out for a hardbound copy if you're going to buy one.

Problems:

As with the centerpiece book in the primary unit, **the focus is on white males**. I'd have preferred to find a book that included the contributions of women and Native Americans to the community and household, but could find none.

There is a dearth of any treatment of women and their use of tools in Noah's community. We see a rare drawing of Rachel, Noah's mother, on p. 35 of the hardbound edition, labeled "Rachel swings the 'Quern stick' to turn the upper millstone." She also appears in the first chapter in an illustration of how women scratched a floral design in the dirt floor when visitors were coming. Noah mentions her and his sweetheart, Sarah, in passing. I suppose that there may have been few women working at the jobs Sloane wants to talk about and illustrate, but I know that women worked the fields and helped build the stone walls, and could do most anything that needed doing, so I'd have included them more if I'd written the book, but I didn't. When I introduced and discussed the book with students, I would talk about the roles of women and where they might have fit, discuss their absence and where and how they are presented, and what all of that means about our culture then and now.

An excellent and meticulously researched source of information about women and their use and invention of tools and technology is Autumn Stanley's *Mothers and Daughters of Invention: Notes for a Revised History of Technology*, particularly Chapter 4, "Daughters of Athena, Semiramis, Margaret Knight, and Wei-Feng-Ying: Women Inventors of Tools and Machines." This book makes a valuable contribution toward making up for the omission of women's contributions and participation in the world of tools and technology. It tends to be a bit listing-dense, but there is invaluable information throughout Chapter 4, and there are helpful headings, bold printed names, and an extensive index to make finding information easy. I have scanned the [first few pages of the chapter](#) and would use that with students, since it gives a good overview, not only of women's contributions but also the development of technology since prehistoric times. Here's a sample quote that I find intriguing and makes me want to read on:

In addition to evidence from myth, we can look at the prehistory of mechanics. Historians of technology usually list five primary machines—lever, wedge, screw, pulley, and inclined plane—plus the wheel and axle, as the basis of further mechanical invention.... *Women used and probably invented all or most of them in prehistoric or early historic times.* (p. 285)

I would then have the book available for further research; e.g., for this unit, a student might look at the section on the 19th century and learn about and report on Helen Augusta Blanchard (1840–1922), a Portland, Maine, woman who holds 28 important patents for such things as sewing machines and a pencil sharpener, but is “totally unknown today.”

Here is what the National Council of Teachers of English, in their “Guidelines for a Gender-Balanced Curriculum,” says about this topic:

If old materials which tend to depict people in gender stereotyped roles ... are the only materials available to suit your content objectives, be certain to comment on these depictions to your class and ask them to tell how these are narrow interpretations of career roles.

If anyone reading this has suggestions for other resources, I’d be grateful to hear about them. You can contact me at judith@davistownmuseum.org.

There are **few references to Native Americans, and what there are tend to be stereotypical, dismissive, and denigrating**. There are references to a friendly Native American presence somewhere nearby, but only mentioned in passing. The stream, over which the characters build a bridge, is called “Red Man Brook,” and, in the fold-out picture of the farm in 1790 and 1805+, there is a drawing of a stereotypical Native American (braids and single feather sticking out of the back of his head) walking on the “Old Indian Trail.” In the text, Noah’s father says that they’ll offer the “ancient” and no longer needed quern to “Indian Tom who has so often admired it” when they get a gristmill. I recommend that you discuss this treatment of Native Americans in the context of when it was written and in light of current improvements. I am planning to put together a unit on Native American tools and contributions, but, until I do so, I don’t have any specific suggestions of resources or links for information on this topic in 19th-century northern New England. I’d be very happy to hear from readers who have suggestions. You can contact me at judith@davistownmuseum.org.

Suggested Activities:

Note: I have not yet used this book with students in any formal way, so I just offer some possibilities, to which I will add as other teachers and I develop them.

Social Studies

- Have students choose, consider, and research a livelihood that someone in your area might have had in the 19th century, based on what they see and read in *Diary of an Early American Boy*. For example, in the Liberty area, there were many coopers who made barrels similar to the maple sap bucket on p.13 and barrel staves for ships traveling with goods to deliver around the world. Ivan Davis, an active senior citizen who still lives in Liberty, made and sold wooden barrel staves. There were also blacksmiths (see pp.14–15 for a discussion and illustration of the forge operation and nail-making), farmers, woodworkers (some of whom worked on boatbuilding), millwrights, wheelwrights, and others. Have students consider which they might like to have done? Ask them to explain why? Have them research the selected livelihood, with special attention to the tools used. Suggest that they ask their grandparents or other senior citizens in their community what they remember people doing when they were little or what their grandparents or great grandparents did. There are books and other resources listed in our [bibliography](#) that offer helpful information on these trades.

For the Liberty area, students could visit the Davistown Museum in Liberty and/or its website and contact the Liberty and Montville Historical Societies. Outside the museum area, you and/or students could contact local historical societies. They may have photos of people engaged in various trades, using tools and/or machines typical of that type of work in the 19th century. Other questions that you might ask students to consider include: What are the current livelihoods in your area; i.e., what do people do for a living? Are any of the jobs that people did in Noah's time still being done in your area? What are they? How has life changed in your area since then? Why?

- Arrange for students to visit blacksmiths, woodworkers, or someone involved in one of the other trades in which the characters in *Diary* are engaged. When considering woodworkers, they might visit a wooden boatbuilder; while there are none in *Diary*, they were important in 19th century Maine. Many families in and around Liberty went to coastal ports nearby, such as Thomaston and Waldoboro, to work on shipbuilding when they were free from farm chores. There are a number of active wooden boat workshops in Maine today. If students cannot visit a workshop, see if you can connect them with someone or an organization, on- or off-line, that practices the skill currently, and is willing to talk and share with students via surface mail, phone or internet. In the Liberty area and beyond:
 - Mike Beaudry, author of *The Axe Wielder's Handbook*, built his own home with hand-hewn timbers, as they do in *Diary* has a business

- centered around hand-hewn timber construction. He offers demonstrations of his trade; his e-mail is mudpond@midcoast.com.
- The Atlantic Challenge Foundation Apprenticeshop in Rockland has a workshop and programs in shipbuilding; the contact there is K.C. Heyniger, kch@atlanticchallenge.com.
 - A helpful resource for finding blacksmiths and information is ABANA, The Artist Blacksmith's Association of North America, Inc. at www.abana.org. John Sundberg, a Davistown Museum board member, practices blacksmithing and is a member of The Ancient Ones, a Maine 1640-1840 reenactment group that demonstrates blacksmithing in period costume is a good resource for finding blacksmiths in Maine.
 - As mentioned earlier, the Ivan Davis family in Liberty has been involved in making barrel staves for many years.
- Ask students to compare what they find to the way the trade was done in the 19th century. Have them make a chart to compare and exhibit the differences and similarities.

Maine/U.S. History and Technology

Direct students to examine the [illustrations of wooden buckets on p.13](#) and the [section on pp. 29ff.](#) about stump-pulling, cutting hoop-poles for the new cooper, and how the hoops were used to hold the barrel staves together. Barrels, similar to the bucket, were the major containers for many commodities in the 18th and 19th century. Barrels, similar to the buckets in *Diary of an Early American Boy*, were the major containers for many commodities in the 19th century. Such barrels were made in the Liberty area and were then shipped around the world, carrying commodities such as molasses, wine, rum, water, salt, and fish oil, in ships built nearby. They were also important as trade items for the West Indies and other destinations.

[The Woodworkers](#) offers good descriptions and illustrations of coopers at work (p. 23). What were the tools used by coopers? We use an excellent book, [The Cooper and His Work](#), which is not listed in the Tools Teach booklist, since it is a self-published book prepared and distributed at a meeting of the Early Trades and Crafts Society c. 1970. (If you wish to pursue this project, we might be able to photocopy some of the pages for you if you contact us.) Questions that you might have students consider: How is maple syrup contained now? Discuss containers then and now. What tools/processes were used then and now to make the containers. Were there any other containers developed and used between the wooden buckets and current containers? What were they? What do the containers tell us about our culture, its technology, and the changes they have undergone. If you live near Liberty, you might investigate the barrel stave makers (See mention of [Ivan Davis](#), current Liberty resident who made barrel

staves) and/or the cannery operations in Liberty and other towns in coastal Maine.

Language Arts:

1. Have students write about what they learned when investigating the trade they chose (in the [Social Studies](#) section) and share with classmates. Students could work alone, or groups could choose one livelihood and pool what they find. They might put their findings together in an album or computer slide show (**Computer Literacy**) that illustrates and shares what they learned of the work that people did in your area in the 18th-19th century. You/they might gather examples and/or illustrations of the tools used. The Davistown Museum website offers information and loans tools. We welcome you to contact the Davistown Museum at curator@davistownmuseum.org for help with this part of the project.
 - When they are visiting or otherwise engaging with the craftspeople, have students interview them, with questions prepared ahead of time. With a whole class, you might work with students so that each student has one question and be sure that they cover the areas you have been discussing. With smaller groups or individuals, you might work with students so that they come up with a short list of pertinent questions that cover the important considerations. It's important that students include questions to which they really want to know the answers, so I'd suggest that a few that might seem off-the-wall, but are appropriate, be included.
 - Ask students to compare what they find out about the way the trade is currently being done with what they've learned about the way it was done in the 18th-19th century. You might have them make a chart to describe the differences and similarities. They could share findings with another class, post them on the class web page, and/or send it to us at the Davistown Museum, via surface or e-mail, and/or arrange with us to post it on our website or to link to it. My experience indicates that we are all more invested in a project if we are preparing it for an audience other than the teacher.
 - If you are able to visit people practicing the trades in *Diary* with your students and are interested in improving the quality of student writing, you might have them bring notebooks and observe and record everything that they see and hear and smell for a period of time while the person being observed is working. Suggest that they think of their notebooks as cameras and that they become word photographers of the people and places that they see. For example, when observing people, they might record, what they wear, their shoes, hair, etc., what they do, how they talk, what they say. For observing the places in which the work is being done, suggest that they write down the smells,

colors, textures of their surroundings. Tell students to record as many sensory details as they can, without censoring what they record. If possible, join the students, and write and share your own word pictures. I'd suggest that a few practices and discussions of the results would be helpful before you visit someone and do this activity. Have students take their notes and produce a word portrait of the person and place observed.

2. Have students write a journal of their lives in a format similar to Noah's diary. Ask them to imagine someone reading it in 100 years and to write about their lives in ways that would provide an understanding of how they and their families lived in the early 21st century. Ask them to include daily routines, as Noah did. They might include entries for each season and or each special event in their lives, including everyday activities such as laundry, chores, employment, transportation, entertainment, and special events such as a holiday, move or special occasion.
3. Have students write a diary from the point of view of a tool as it moves from its origins, perhaps in a 19th-century forge somewhere nearby, to its current status, maybe used by a boat builder at the Apprentice Shop in Rockland or rusting in a shed behind someone's house. Suggest that they write about who's owned it, what it has been/is used for, its feelings about what it helps to create. Students could take their pieces through a writer's workshop process, from brainstorming through publication, with our website as a possible publisher.
4. Discuss the following questions with students: Would you like to live in Noah's world? Why or why not? What does he have that you don't and might like? What do you have that he doesn't and that you might miss? Students could then make charts, either individually or with the class, and write essays comparing and contrasting his world and theirs.
5. Have students write a listing poem. They could try one using the details they recorded in Activity 5 above. Or it might be fun to write one about then and now. They might write a stanza about each or write alternating lines, juxtaposing their choices, e.g., the plastic jug of maple syrup on the grocery store shelves that will be either thrown on the dump or melted and recycled/ the wooden bucket that will be used year after year and be passed from family to family. Suggest that, even if they are writing toward a theme or point, they need to remember to show and not tell; i.e., to just "show" the reader each object with clear, specific details, not making "telling" comments about how they are different, better/worse, letting the reader decide. Or they might do the same thing about a day or time of day in their lives and Noah's life. Try

writing with them and share what you come up with. Share results with us at judith@davistownmuseum.org .

Art

1. Students could make line drawings, like Sloane's, or picture collages of the tools, containers, and processes that they encounter in the above activities. They might juxtapose 19th- and 21st-century versions of a tool, livelihood, container, or process, and include them in their presentations. "Sketching Gadget Academy" on the Museum of Science web page <http://www.mos.org/sln/Leonardo/InventorsToolbox.html> offers some helpful suggestions for making sketches of simple machines/tools.
2. I have enjoyed working with young people to make [sculptures](#) using tools and simple machine parts that I gathered from our home, barn, and [Liberty Tool Co.](#) and the [Hulls Cove Tool Barn](#). See [Fun Things to Do at the Davistown Museum](#) for a description of how we approach the project.

Physics

In conjunction with the books listed as supplementary texts, *Diary of an Early American Boy* offers numerous windows into a discussion/understanding of simple/complex machines.

1. The **bridge-building** in Chapter 3 (pp.16–23), the major project in the chapter, is a study in the use of simple machines and the process and development of early American technology and towns. The sections on wheels and axles (pp.10–11), levers (pp.16–17), and pulleys (pp. 18–19)—clearly illustrated and explained in the Eyewitness Series book [Force and Motion](#) (pp.16–19)—would nicely supplement and expand the discussion and illustrations in *Diary*, since it covers ancient to modern machines. And I came across an apropos 1973 [Portland Press Herald article](#) and photograph of a crane used at Bath Iron Works that set a "Western Hemisphere record...by lifting a 275-ton ship superstructure assembly into place." This would make an excellent starting point for a discussion of the uses and development of cranes and their simple machine components from ancient to current times. [How Science Works](#) has a great section on levers and pulleys with simple experiments and directions and a template for making a working model crane (pp. 102–19).. I discovered some fascinating information on bridge building on the [PBS website](#) and was subsequently came across a video tape, in my local library, of a show called [Building Big Bridges](#) from the [David Macaulay](#) PBS series "Building Big." This is an excellent resource to pair with what students see and read in *Diary*.
2. **Sources of power:** Water is a major source of power for the Blakes in *Diary*, as it was everywhere in 19th-century America. The waterwheel is discussed and illustrated in *Diary* in a number of

places: On pp. 35–40, Noah makes a plumping mill for grinding for his mother; on pp. 50–53, the sawmill cum waterwheel is constructed and explained. In Chapter 3, Noah’s father mentions that he will no longer have to work the bellows in the forge once they have a waterwheel. Compare the idea of waterpower and its evolution with our current sources of power. The first edition of Macauley’s *The Way Things Work* has a good two-page spread on “the wheel and axle at work” on pp. 36–7 that juxtaposes an overshot waterwheel on one page with a hydroelectric turbine on the next. This could lead to a discussion of how simple machines are involved, even in nuclear power plants. [Macauley](#) offers diagrams of steam and nuclear power operations

Chemistry

Students can learn about the chemistry of metal production, moving out from the forge and nail-making section in *Diary*. Steve West, an 8th grade teacher who lives near us, used a tool kit and resources from the Davistown Museum for a hands-on [project that taught the chemistry of iron as well as of technology and American history](#). The best resource that we have found for this topic is “Ironmaking,” a pamphlet published by the National Park Service. Skip, the Davistown Museum founder and curator and my husband, is an expert on this topic, on which he lectures and writes; there are [sections of our website](#) that deal with the topic. [Macauley](#) offers a diagram of a blast furnace on pp. 156–7. There is a very short, chronologically presented section on iron and steel in *The Usborne Handbook of Invention and Discovery*. Skip’s recent lecture series and writing and Steve West’s project have just recently opened me to the possibilities for this area in our education component, and I am currently researching further resources. I will add information and links as soon as I can.

Math

I have nothing to offer at present, but hope to include activities and welcome suggestions. More ambitious and knowledgeable teachers than I might incorporate the mathematics concepts involved in the physics of simple machines.

OTHER BOOKS TO USE WITH/WITHOUT THE FOCUS BOOK:

Kalman, Bobbie. *The Blacksmith*. New York, New York: Crabtree Publishing Company. (2001)

Kalman, Bobbie and Brady, Deanna. *The Woodworkers*. New York, New York: Crabtree Publishing Company. (2001)

Description/Annotation:

These books, and others in the Crabtree “Colonial People” series, offer valuable information and illustrations about people and their livelihoods in colonial times. While the period in which the books are set is considerably earlier than the 19th-century focus of this unit. The clothes are wrong; the work and tools are basically the same. The books contain two-page illustrated spreads about different aspects of the trades and end with a section on apprenticeship, featuring 10–15 year old children (boys in these two series books). There are explanations, color drawings, and photographs of re-enactors in modern-day restored living history museums for each topic. There is a glossary on the last page

The catalog card says that *The Woodworkers* “discusses the importance of wood in colonial times, describing how trees were cut down and made into lumber and the training of apprentice carpenters, cabinet makers, coopers, and wheelwrights.” It contains well-presented information on trades that flourished in 19th-century Davistown and coastal Maine, including the shipwright. Page 12 offers a drawing of eight men engaged in aspects of preparing wood to build a house and has a “Find the right tool!” section, in which the reader matches a list of tools to the builders in the picture using them. The tools include an adze, a plane, screw augur, mortise ax and mallet, rip saw, and froe.

The catalog data describes *The Blacksmith* as introducing “the tools, activities, and importance of the blacksmith in colonial times.”

The photographs include a few men of color engaged in blacksmithing.

Where to Find the Book:

This is available at Amazon.com: www.amazon.com.

Problems:

Women are only pictured using “gadgets for the home” made by blacksmiths. Stanley says, “Though female blacksmiths...did exist, as English place names such as Ladysmith reveal, little or nothing of their work has been recorded.” ABANA, The Artist Blacksmith's Association of North America, Inc. at www.abana.org, offers information and photographs of the work of contemporary women blacksmiths on their web page. I have contacted them for information about women blacksmithing in the 19th century, have received some suggestions to follow up. I will add what I find out to our web version and subsequent editions of *Tool Teach*.

Related Resources:

ABANA is a rich source of information on blacksmithing. See their website, <http://www.abana.org/index.shtml>, or check their publications.

Challoner, Jack. *The Visual Dictionary of Physics*. New York, New York: Eyewitness Visual Dictionaries, DK Publishing, Inc. (1995)

Description/Annotation:

I'm not sure that this should be included as a major text for the unit, since there is only a small amount of material specific to the area we're covering, but I really like the two-page spread on simple machines, pp. 16–17. It has a short, concise definition of simple machines, a list, and excellent photos and diagrams labeled to show the terms associated with, the types of, and work done by each. These two pages provide a helpful complement when discussing the concept and kinds of simple machines, in general or in conjunction with other materials, such as *Diary of an Early American Boy* or books that don't include a simple introduction/review/overview of simple machines. The machines illustrated and explained include the inclined plane, with wedge and screw as types of inclined planes, pulleys (double, simple, quadruple), lever (three classes), and wheel and axle.

Hawkes, Nigel; Jackson, Mark; and Pipe, Jim, Eds. *How Science Works*. Brookfield, Connecticut: Copper Beech Books. (2001)

Description/Annotation:

What I say: This book features clear explanations of concepts in text and illustration and simple experiments, as well as directions and patterns for making models based on the principles discussed. Chapter 5, "Trucks, Tractors, and Cranes," offers a section on "The Science of Machines," one on "Levers and Pulleys," and instructions for making a model crane. This book is a stand-out in terms of gender and ethnic representation. There are as many girls as boys in illustrations, with a girl on the cover with the model crane.

What reviewers say:

From School Library Journal

Grade 4–8—A visually enticing, large-format volume that aims to involve parents and children in the mutual exploration of scientific principles through hands-on experimentation. Hann begins by listing the requisite materials for investigation, the majority of which are household items. She encourages improvising when an

object is not readily available. Each of the six sections—matter; energy, force, and motion; light and sound; air and water; electricity and magnetism; and electronics and computers—combines a lively, understandable text with a number of activities and projects that illustrate the topic. Interspersed throughout are discovery sections that focus on individuals or events of scientific importance. The sections are logically arranged, but readers can skip around according to their own interests. The step-by-step instructions are very clear and include admonitions for adult supervision when advisable. The accompanying full-color photographic layouts are lavish and detailed, but not cluttered. They depict multiethnic boys and girls of varying ages (and occasionally adults) and clarify the steps of the experimental process in an imaginative and appealing manner. Diagrams are well designed, colorful, and clearly captioned. Measurements are presented in both metric and English units. Although minor, there are a few flaws. Occasionally, an undefined scientific term is used, and definitions for abbreviations of measurement could not always be located. A cut above most how-to science books. —*Sylvia V. Meisner, Allen Middle School, Greensboro, North Carolina*

Where to Find the Book:

I found ours at Amazon.com: www.amazon.com.

Problems:

As often seems to be the case in the books I've found, the basic general information on simple machines is at the end of the book rather than at the beginning or with the relevant chapters. The last chapter is called "Scientific Principles: Look Back and Test Your Knowledge." In it, there is a good, short explanation of simple machines, which the authors list as the wheel, lever, pulley, and ramp. The authors seem to be operating on the plan that they will get students involved with the models first, then offer scientific explanations and have them return to the text and models to see how they apply. This may work, but I'd suggest that the information could be helpful used in conjunction with, rather than after, the other sections I mentioned. There is also a good simple explanation of Newton's Law in that last chapter. The websites listed in "[Online Resources](#)" and [copies](#) of material from those sites in the *Tools Teach* appendix offer a number of very basic overviews of simple machines that could be used, if needed, in conjunction with this book.

Lafferty, Peter. *Force and Motion*. New York, New York: Eyewitness Books, Dorling Kindersley. (2000)

Description/Annotation:

This is a volume in the Eyewitness series that aims to make complex topics easy to understand. The *Library Journal* puts it in the 5–8 grade category, but there's no reason that older students wouldn't enjoy and learn from it. This is the first book in our unit that does not focus on early America but on physics principles and the use of motion and machines in world history, providing a good

introduction to simple machines and the science of motion. The catalog card description says it “explores the principles of force and motion, describing how they have been applied from ancient to modern times.” The book opens with chapters on simple machines: ramps and wedges, wheels and axles, Archimedes screw, and levers, and gears, and then continues on to discuss and illustrate the science of motion. I appreciate how the information is presented to give an overall picture of the concept/machine throughout history. In the two-page spread on levers, there are excellent photos of a model of Egyptians using ramps (and pulleys), of a Bronze-Age axe head, a carpenter’s plane, a zipper, screws, and wedge and mallet splitting wood; the plane and wood splitting provide a link to *Diary of an Early American Boy* and 19th-century life and tools. The Egyptian use of ramps and pulleys closely resembles the bridge-building process illustrated in *Diary*. Following are a review and catalog description:

From School Library Journal

Grade 5–7—These two series entries explore traditional topics in the lavish full-color photographs and drawings characteristic of so-called coffee table books. Many are of items rarely seen in science books—historic equipment from museum collections. Each chapter runs two pages, with a short introduction and explanations around the numerous illustrations. Because the art dominates, the text is limited and provides just a glimpse of each subject....*Force and Motion* is well written, featuring standard subjects (friction and gravity) mixed with unusual ones (the science of cannonballs and hoists). Librarians should couple these books with standard “text-heavy” science books. Unfortunately, no list of recommended readings is included. Yet for the art alone, these books are fine additions to most collections. —Alan Newman, American Chemical Society, Washington, D.C.

DK gives a new look to the series that forever changed the nonfiction genre and set the standard for highly informative visual guides. This volume...focuses on contemporary and historical developments in the study of forces and motion, featuring clear, expertly written text, color and black-and-white photos, charts, graphics, and 3-D models—all of which combine to make complex scientific concepts easy to understand.

I particularly like the great schematic on the title page with clear, beautifully presented photographs of simple and complex machines, such as the first lawnmower (c. 1860), a model of a Greek water mill, and a twin cylinder aircraft engine. I find the book to be engaging, informative, and helpful in thinking about simple machines and how they have been used throughout history, in 19th-century Maine, and in the tools we have in the museum and our stores.

Where to Find the Book:

I found ours at Amazon.com: www.amazon.com.

Problems:

As so often seems to be the case in the books I’ve found, the author never offers a simple introductory definition, list, or general discussion of simple machines.

He just starts in with ramps and wedges and then moves on to the principles that make them efficient users of force and motion, making human endeavors easier and sometimes possible where they wouldn't be without them. There seems to me to be a missing link. Neither I, nor any other teacher that I know, has used this book with students yet, so I look forward to feedback and welcome comments about and descriptions of using the text. I'm particularly interested in hearing from teachers of physics, whose knowledge base and experience teaching about simple machines greatly exceeds my own. You can add your suggestions and experiences to our page by sending them to judith@davistownmuseum.org.

Macaulay, David. *The Way Things Work: From Levers to Lasers, Cars to Computers—a Visual Guide to the World of Machines*. Boston, Massachusetts: Houghton Mifflin Company. (1988)

Description/Annotation:

We have the 1988 edition, and there's plenty in it to keep anyone interested and informed about simple and complex machines for a long, long time. But there is a new improved version which we don't yet own that offers even more. I've copied some of the reviews that appear on the Amazon.com page to fill you in on the earlier and newer versions:

Editorial Reviews

Amazon.com

"Is it a fact—or have I dreamt it—that, by means of electricity, the world of matter has become a great nerve, vibrating thousands of miles in a breathless point of time?" If you, like Nathaniel Hawthorne, are kept up at night wondering about how things work—from electricity to can openers—then you and your favorite kids shouldn't be a moment longer without David Macaulay's *The New Way Things Work*. The award-winning author-illustrator—a former architect and junior high school teacher—is perfectly poised to be the Great Explainer of the whirrings and whizzings of the world of machines, a talent that landed the 1988 version of *The Way Things Work* on the *New York Times* bestsellers list for 50 weeks. Grouping machines together by the principles that govern their actions rather than by their uses, Macaulay helps us understand in a heavily visual, humorous, unerringly precise way what gadgets such as a toilet, a carburetor, and a fire extinguisher have in common.

The New Way Things Work boasts a richly illustrated 80-page section that wrenches us all (including the curious, bumbling [wooly mammoth](#) who ambles along with the reader) into the digital age of modems, digital cameras, compact disks, bits, and bytes. Readers can glory in gears in "The Mechanics of Movement," investigate flying in "Harnessing the Elements," demystify the [sound of music](#) in "Working with Waves," marvel at magnetism in "Electricity & Automation," and [examine e-mail](#) in "The Digital Domain." An illustrated survey of significant inventions closes the book, along with a glossary of technical terms,

and an index. What possible link could there be between zippers and plows, dentist drills and windmills? Parking meters and meat grinders, jumbo jets and jackhammers, remote control and rockets, electric guitars and egg beaters? Macaulay demystifies them all. (Click to see a [sample spread](#) of this book, illustrations and text copyright 1998 David Macaulay, Neil Ardley, published by Houghton Mifflin Co.) (All ages) —*Karin Snelson*

There are great sections on the inclined plane, levers, wheel and axle, gears and belts, pulleys, screws in our 1988 edition. Macaulay avoids all problems with gender and ethnicity by featuring a woolly mammoth as the unifying element and occasional gender and ethnically neutral line drawings of humans.

Problems:

I have a personal problem with Macaulay books. I love them, and this one is a valuable and attractive resource, but I find it overwhelming—so much information on each of the 379 pages that I find it hard to focus and take in even a small part of what's offered. I think that's a personality trait, but I suspect others might share it, so thought I'd mention it.

Where to Find the Book:

You can find the new edition at Amazon.com: www.amazon.com; the older one is out of print but available in libraries, through Amazon.com or any other site that offers to find out-of-print books.

Supplementary Books:

Barfield, Arnold. *Farming*. East Sussex, England: Wayland. (1984)

Burne, Gordon. *Tools and Manufacturing*. East Sussex, England: Wayland. (1983)

Burne, Gordon. *Iron and Steel*. East Sussex, England: Wayland. (1984)

Clements, Gillian. *The Picture History of Great Inventors*. Nottingham, England: Dealerfield Ltd. (1995)

Fisher, Leonard Everett. *Colonial American Craftsmen: The Cabinetmakers*. New York, New York: Franklin Watts, Inc. (1966)

Kalman, Bobbie. *Colonial Crafts*. New York, New York: Crabtree Publishing Company. (1992)

Kalman, Bobbie. *Tools and Gadgets*. New York, New York: Crabtree Publishing Company. (1992)

Macaulay, David. *Cathedral: The Story of Its Construction*. Boston, Massachusetts: Houghton Mifflin Company. (1973)

McGovern, Ann. *If You Lived in Colonial Times*. New York, New York: Scholastic Inc. (1992)

Miller, Cameron and Falia, Dominique. *Woodlore*. New York, New York: Ticknor and Fields Books for Young Readers. (1995)

Reid, Struan. *The Usborne Illustrated Handbook of Invention and Discovery: The Facts You Need to Know—at a Glance*. London, England: Usborne Publishing Ltd. (1986) [Good two page explanation of iron and steel making.](#)

Sloane, Eric. *A Museum of Early American Tools*. New York, New York: Funk and Wagnalls, Inc. Reprinted in 1973 by Ballantine Books. (1964)

Sloane, Eric. *Reverence for Wood*. New York, New York: Funk and Wagnalls. (1965)

Sloane, Eric. *Once upon a Time: The Way America Was*. New York, New York: Hastings House. (1982)

Stanley, Autumn. *Mothers and Daughters of Invention: Notes for a Revised History of Technology*. New Brunswick, New Jersey: Rutgers University Press. (1995)

Online Resources

Our website offers a wealth of information at <http://www.davistownmuseum.org/>. Students may find it concept- and information-dense, and consequently, reader-unfriendly. Hopefully, they will be able to find sections and information to suit their needs, and an adult might help them navigate. We are working on making the site more user-friendly; we are writing and will post sections and/or navigation guides for students and/or less informed readers like me. Steve West, the 8th grade teacher using our resources, linked students to the section on “Hand Tools in History,” <http://www.davistownmuseum.org/TDMtoolHistory.htm#toolchr>, for his purposes.

Most of other websites that I visited and listed so far are geared toward elementary school students. On many of them, the resources could be geared up for older students. I enjoyed and learned from them. I will add other sites that are more directly relevant to older students as I find them. Please let me know of any that you know of by contacting me at: judith@davistownmuseum.org.

1. I love the **Simple Machines page on the Edheads website**, <http://www.edheads.org/activities/simple-machines/>.

Here’s what they say about themselves:

About Edheads

Our Mission:

Edheads will create unique, educational Web experiences designed to make hard-to-teach concepts understandable using the power and interactivity of the Internet. We will set a new standard for excellence by delivering in-depth content in a fresh, exciting style allowing the user to learn intuitively in an online environment.

Our Core Values:

We believe that the Internet is a powerful educational tool, which should be used to help students learn and teachers teach in exciting and unique ways. We will create innovative learning experiences that motivate the student and promote additional learning and exploration beyond the classroom. We believe that students and teachers should be engaged in the pursuit of life-long learning that is both satisfying and enriching. We will create the highest quality experiences online and continuously strive for excellence in everything we do.

Connections to Standards:

All the activities at the Edheads site will have connections to National and State standards in their teacher sections. Please look for these sections under each activity heading.

Here's what I say: There are **animated interactive activities** where the visitor can go to a "room" and identify and learn about the simple machines in it; e.g., in the bathroom, one would click on the toilet bowl cover, decide what it does and then which machine it is in an interactive quiz format followed by an animated explanation. The simple machines are in the house, and there is a similar **activity/interactive lesson on complex machines** in the barn. Hosted by a talking robot, it includes an **excellent glossary** and "**tips for using the site with students.**" It is **keyed in to the Ohio Science Standards**, which are similar to Maine's Learning Results and other states', as well as to **National Science Standards** for grades 1–3; these could easily be geared (!) up to meet upper grade standards. **There's a downloadable simple machines pre- and post-test.** It's an attractive, engaging site; I would, however, recommend turning the very loud, tinny music down or off, particularly in a classroom!

2. In my wanderings in Cyberspace, I came upon a **website** called Marvelous Machines with wonderful activities geared toward **teaching the concept of simple machines** (www.galaxy.net/~k12/machines). They say that the activities are geared toward a 3rd grade level, but I feel sure they could be adapted for any age. I have copied and included [parts of the website](#) in the appendix, including the introduction to the unit, the table of contents, and one experiment with levers to give a sense of what is available. They state that reproduction of the materials for educational use is encouraged as long as their copyright notice is included. Here is how they introduce the unit (I've bolded important aspects):

This unit supports what the kids have already read or learned about simple machines and gives them the opportunity to try out different things for themselves. Just as importantly, it **introduces or reinforces experimental technique and scientific thought**, e.g., hypotheses, conclusions, deductions, predictions, applications, observations, documentation and data analysis. It also **makes heavy use of language arts and math skills and provides an opportunity to reinforce teamwork skills.**

3. Todd Hanson, a graduate student at the University of Houston, developed a helpful resource, **Simple Machines Learning Site** at http://www.coe.uh.edu/archive/science/science_lessons/scienceles1/finalhome.htm. According to the introduction on the first page, "the purpose of this website is to teach elementary students about the six simple machines. Each of the machine pages below contains information and activities for the students to use. Teachers may use the links at the bottom for ideas, resources, and lesson plans." It includes a short interactive quiz and links. The first page has a definition of simple machines and icons that take the

visitor to pages on levers, inclined planes, wheels and axles, screws, wedges, and pulleys. The pages include a definition, examples, and experiments.

4. An inspiring website is The Amazing Web Page of Alexis at <http://www.geocities.com/EnchantedForest/Cottage/6102/>. Alexis is a 12-year-old who is, well, amazing, and who won a Rube Goldberg invention contest when he was 7. He provides some great links and information about inventions, simple machines, and Rube Goldberg inventions. He shows you his winning Rube Goldberg machine and gives suggestions for making one of your own. Here's a description of Alexis's winning project to pique your interest:

Winning Project Description: "Magic School Bus"



What is this all about? Rube Goldberg "machines" are a fun way to experiment with crazy contraptions that you build from things around the house. The purpose of the 1998 contest was to construct a machine that could turn the page of a book.

Machines must have at least ten steps and may not utilize electricity from a wall outlet. The only human contact should be to initially start the machine.



Alexis's machine, called the "Magic School Bus" after his favorite books, used 13 steps. It was built from things found around the house like toys, balls, cardboard from pizza boxes and tissue boxes, string, paper towel tubes, a mousetrap, wood, and nails. It was decorated with construction paper and spray paint.

7. Alexis sent me to the **Museum of Science web page** that has some wonderful ideas and information related to Leonardo da Vinci at <http://www.mos.org/sln/Leonardo/InventorsToolbox.html>. I particularly like the Inventor's Workshop with the sections called "The Elements of Machines" and "Gadget Academy" that asks students to identify, in an interactive, illustrated "quiz," the machines involved in some tools one could find around the house, e.g., hand-powered drill and wing-handle corkscrew. It includes some complex machines like rack and pinion, cams, and bevel gears. It offers a classroom activity, "Sketching Gadget Academy," the main idea of which is "close observation and sketching

- lead to a better understanding of how machines work.” It asks students to observe small common machines such as egg beaters, drills, windup toys, pencil sharpeners, etc., to think about how they work, and to sketch them from different points of view, adding labels and arrows to indicate their operation. I like the follow-up activity that asks students to involve parents by asking them to locate examples of machine diagrams from home, e.g., instructions provided by manufacturers that come with bicycles, kitchen appliances, tools, etc., and then to discuss and compare their findings.
8. The *New York Times Learning Network* website, developed in partnership with The Bank Street College of Education, <http://www.nytime.com/learning>, offers some great teacher resources. I found the very detailed lesson plan for “Exploring the Design and History of Life’s Little Helpers,” <http://www.nytime.com/learning/teachers/lessons/20030306thursday>, fascinating and think it would dovetail nicely with the areas covered in our suggestions and offerings. Like the Edhead website (#1 above), it offers suggestions for relating the activities to academic standards/benchmarks, general as well as state-specific, great interdisciplinary ideas, and resources. They list the Overview of Lesson Plan as follows: “In this lesson, students will create a museum exhibition that explores the changes in usage and design of simple tools and household utensils.” Here is a section of the project that would work particularly well with the Davistown Museum’s education component:

Each pair of students will research the object, then prepare a display board and a written entry for the museum's catalog, addressing the following categories of information (written on the board or copied in a handout for easier access):

Evolution of Design

- What is the earliest use of this object in everyday life?
- How was the item first made?
- What physical changes, if any, has this item gone through?
- What changes in materials, if any, has this item gone through?

- When was the item first mass-produced?

9. The PBS website <http://www.pbs.org/wqbh/buildingbig/bridge/index.html> offers a great deal. I was interested in the Building Big series and found the section on bridge building particularly relevant to the study of simple machines. I enjoyed the [video version](#) of an episode done by [David Macauley](#) aired in this series.

10. The Cabaret Mechanical Theatre at www.cabaret.co.uk/start.htm is great fun. It is the website for a British company that makes and exhibits automata, a kind of mechanical sculpture, and offers educational programs about the science of movement, with projects for students to make.

ABOUT US:

THE MUSEUM

The Davistown Museum is a tool, art, and regional history museum. Its primary mission is the recovery, interpretation, and display of hand tools used in Maine and New England's maritime culture. It also serves as an important clearinghouse for information on the history of hand tools and their roles in the early industries of Maine and New England. Another mission is to provide a forum for contemporary Maine artists to exhibit their work. The Davistown Museum creates a unique environment that juxtaposes tools, which can be experienced as both historical and sculptural objects, with conceptual, assemblage, abstract, and traditional art. The museum also strives to increase community awareness of and access to information on local, regional, Native American, and environmental history.

The museum was founded in 1999 by Skip Brack, proprietor of and buyer for the Jonesport Wood Company, which includes the Liberty Tool Company, Hulls Cove Tool Barn, and Captain Tinkham's Emporium in Searsport. His collection of interesting and significant tools, art, and Native American artifacts, much of which was acquired during his buying trips throughout New England, outgrew the space in his home, and he decided to share his collection and knowledge. He opened the Davistown Museum, named for the Davistown Plantation that now includes Liberty and Montville, in the historic building across the street from Liberty Tool Company. He expanded the museum's mission to include local history. The original collections have grown considerably and consistently as the museum's important mission becomes known. Skip and web manager, Beth Sundberg, developed an extensive web site (www.davistownmuseum.org) that offers visitors a taste of the museum collection, as well as essays on museum-related topics, extensive bibliographies, and links.

Included in the Davistown Museum's offerings are exhibitions, the website, and a library for exploration of the subjects on which it focuses. The Liberty museum includes an extensive collection of eighteenth and nineteenth century hand tools, an art exhibition of the work of 75+ contemporary Maine artists, a library, archives, and a local history research room. There is a Children's Corner, featuring activities and materials for preschool through middle school age children. An outdoor sculpture garden adjacent to the Hulls Cove (Bar Harbor) office features the work of contemporary Maine sculptors interwoven with flowers. The museum website offers resources to complement and expand its on-site presentations of the history of tools, regional and state history, art, environmental history and the interrelationships between them. The Center for the Study of Early Tools offers a library and accommodations for visitors interested in studying at the museum for extended periods. Judith Bradshaw Brown, Ed.D., is currently developing an educational component, offering resources for students and teachers of all levels interested in understanding

Maine history, New England maritime culture, the history of tools and technology, and the relationships between them. There will be educational offerings at the museum for drop-in visitors and scheduled field trips, kits for loan to teachers and students, and lessons and activities available in a print publication and on the web site.

To learn more about the museum and its offerings, visit its website at www.davistownmuseum.org.

BIOGRAPHIES OF CONTRIBUTORS:

Judith Bradshaw Brown, Ed.D., has a doctorate in literacy education from the University of Maine. She has taught students in preschool through graduate school from California to Maine, where she currently resides. Most recently, she taught undergraduate and master's level education courses at the University of Maine at Farmington and Orono and, before that, high school English at Mt. Blue High School in Farmington, ME. She worked with primary school children and teachers during her doctoral studies, as Graduate Assistant in the University of Maine Center for Reading Recovery and Associate Director of the Summer Internship for Literacy Master's Degree Candidates in the University of Maine Summer Reading/Writing Clinic. She also served as director of the Summer Program for High School Students at Columbia University. She has presented her work in many publications and at conferences throughout the United States. She is currently retired from teaching, living in Bar Harbor, Maine, with her husband, Skip Brack. She helps run his tool businesses, the Davistown Museum in Liberty, Maine, and her favorite work involves flower gardening in the museum's Hulls Cove (Bar Harbor) sculpture gardens.

H. G. "Skip" Brack is the founder and curator of the Davistown Museum. He is the proprietor of and buyer for the Jonesport Wood Company, which includes the Liberty Tool Company, Hulls Cove Tool Barn, and Captain Tinkham's Emporium in Searsport, ME. He holds a B.A. from the University of Massachusetts and an M.A. from the University of the Pacific. His publications include much of the text on the museum website and numerous print editions of that information. He has published *The Registry of Maine Toolmakers* and *Norumbega Reconsidered*, and numerous other books available through the museum. He is a frequent lecturer on the history of tools at such places as the Maine Historical Society, Bath Maritime Museum, and the Atlantic Challenge Foundation.

**LETTER FROM STEVE WEST, TEACHER WITH WHOM WE WORK,
DESCRIBING WHAT WE DO:**

I really enjoyed my experience working with the Davistown Museum. Judith and Skip were very helpful with the development of my lab on tools, which I called "From Supernova to Tools." Skip was able to provide excellent information, both in person and on the Davistown Museum site. His knowledge and expertise were particularly helpful in getting the lab off the ground. He provided all the tools used for the lab, a collection that spanned 300 years. He let me borrow them for as long as I wanted, providing more information when I asked further questions. Having the tools on hand and watching the students work with them really brought home the power of real historic artifacts in the learning process.

The final product that the kids created was an Apple works presentation showing the history of tools. We were able to share the slideshow in house and we look forward to posting the student work on line. The Davistown site (in the future) will hold examples of student work either linked from our school site or built directly on their site.

Judith was able to provide many print resources that the students could use. She provided encouragement and many books and catalogs on tools. She also was able to come into class and help to critique the final product. Judith is fantastic at outreach, and I look forward to developing the lab more and working with her on simple machines in history.

It is my fervent hope that the Davistown Museum, in the real and virtual world, will be able to continue its very important and unique work. It has been and will continue to be an invaluable resource in my teaching.

- Steven West
Connors-Emerson School
Bar Harbor, ME