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| **TITLE (link)** | **LEVEL** | **SUBJECT** | **DESCRIPTION** | **RELATED RESOURCES** |
| [Background Information](https://drive.google.com/open?id=0B_m8Lfd_tvOLZWtXOGVCSVlkUFU) | All |  | General background information applicable to most lessons. |  |
| [Be A Sugar Maker](https://drive.google.com/open?id=0B_m8Lfd_tvOLZU9pOVpuTzNIZzg) | K-2 | Science  Cycles | Role-play the sugar making process with the option to expand into the water cycle. Tapping for sap is a wonderful accompaniment to this activity. | -[Sugaring Tool Cards](https://drive.google.com/open?id=0B_m8Lfd_tvOLMm00a0sycEtSWDA)  -[Tapping for Sap](http://primarylearninglogs.blogspot.com/2012/02/tapping-for-sap.html)  -[Terrific Trees](https://drive.google.com/open?id=0B_m8Lfd_tvOLUFZkVmJSRHFBNm8) |
| [Find the Sugar Maple](https://drive.google.com/open?id=0B_m8Lfd_tvOLZ0luamUtc01takE) | 3rd-6th | Science, Language Arts | Learn about how to identify the different kinds of maple trees native to NH. Then make a flipbook with pictures or photos of the different trees and explain their own tips for identifying trees. |  |
| [Nature's Factory At Work](https://drive.google.com/open?id=0B_m8Lfd_tvOLSkNTUlp4LXU5UXM) | 3rd-6th | Science | Students will learn about the layers of a tree trunk, discover the process of photosynthesis and learn about the water cycle.  Also explore solutions and evaporation. | -[Sugar Maple Inquiry Cards](https://drive.google.com/open?id=0B_m8Lfd_tvOLUmZmUGkxWjgtdHM)   * [NHMPA Photosynthesis poster](http://www.nhmapleproducers.com/wp-content/uploads/2016/10/boy-girl-sugar-poster.pdf) * [Tree Rings](http://www.agclassroom.org/ny/resources/maple/TreeRings.pdf) (math) |
| Pancakes | [1st - 2nd](http://www.agclassroom.org/nh/matrix/lessonplan.cfm?lpid=534&search_term_lp=pancakes)  [3rd-5th](http://www.agclassroom.org/nh/matrix/lessonplan.cfm?lpid=369&search_term_lp=pancakes) | Science | Describe physical properties of materials and observe physical and chemical changes as they learn about the ingredients in pancakes and how maple syrup is harvested from trees. |  |
| [Tapping Into Maple Tradition](https://drive.google.com/open?id=0B_m8Lfd_tvOLVVk4QU00S2Q0QVU) | 2nd-6th | Language Arts, Science, Math | Oral and written communication, mathematical representation plus physical and conceptual models to describe and explain scientific concepts and ideas. Use inquiry strategies to investigate and understand the natural world. Younger students will learn to use the process approach to writing coherently and using appropriate conventions. | -[Sugar Maple Inquiry Cards](https://drive.google.com/open?id=0B_m8Lfd_tvOLUmZmUGkxWjgtdHM) |
| [Where's The Maple?](https://drive.google.com/open?id=0B_m8Lfd_tvOLc2pLOUR6MXVNWHM) | 4th- 5th | Social Studies (GIS mapping), LA | Engage students in the process of maple sugaring by reading Maple Syrup Season and completing a chronology activity. Students can then be guided through an ArcGIS Online activity showing them why NH has business based on maple sugar and allows them to map and explore area sugarhouses. |  |
| [Looking Back, Thinking Forward](https://drive.google.com/open?id=0B_m8Lfd_tvOLSkNTUlp4LXU5UXM) | 3rd-6th | Social Studies | Learn about the maple sugaring process - the equipment and its changes over time, climate, and technology.  How has it changed through history and what might it look like in the future? | * [Maple History Short Video](https://drive.google.com/open?id=0B_m8Lfd_tvOLc0xGZ3F3WEVOc3M) * [Legends](https://drive.google.com/open?id=0B_m8Lfd_tvOLWTNIdXJFZGdSSTA)   -[Make A Birch Bark Container](https://drive.google.com/open?id=0B_m8Lfd_tvOLZURCSWxuaEtxdnc)  -[A Day At Sugar Camp](http://www.woodlandindianedu.com/coloringpages.html)  -[Sugar Maple Inquiry Cards](https://drive.google.com/open?id=0B_m8Lfd_tvOLUmZmUGkxWjgtdHM) |
| [Maple Temperatures](https://drive.google.com/open?id=0B_m8Lfd_tvOLa2NBbXp5T1FiY0E) |  | Math | Explore different temperatures involved with maple sugaring. Learn about sling a thermometer to take temperature and use fractions to convert from Fahrenheit to Celsius and back. | -[Maple Weather - Will It Run](http://www.agclassroom.org/ny/resources/maple/MapleWeather.pdf)  [Today?](http://www.agclassroom.org/ny/resources/maple/MapleWeather.pdf)  -[Sap In The Sugar Maple video](https://vimeo.com/82816054) |
| [Make A Birch Bark Container](https://drive.google.com/open?id=0B_m8Lfd_tvOLZURCSWxuaEtxdnc) | K-3rd | Art |  | [Maple History Short Video](https://drive.google.com/open?id=0B_m8Lfd_tvOLc0xGZ3F3WEVOc3M) |
| **TITLE (link)** | **LEVEL** | **SUBJECT** | **DESCRIPTION** | **RELATED RESOURCES** |
| [Sweet Sugaring](https://drive.google.com/open?id=0B_m8Lfd_tvOLQXVlMHdPRHd5Z3M) | Elem & Middle | Science, Language Arts, Math | Learn about maple sugaring and give it a try! | [Making Maple Syrup](http://www.massmaple.org/MakingMapleSyrupActivity.pdf) |
| [Sap Value Calculation](https://drive.google.com/open?id=0B_m8Lfd_tvOLeHNkYmE1S3pmMVU) | Middle | Math | Analyze graphs of the different versions Jones Rule of 86 to see that the higher the Brix score, the less amount of sap needed to produce a gallon of syrup. |  |
| [Sugar Saturation and Maple Syrup](https://drive.google.com/open?id=0B_m8Lfd_tvOLSUFNWm5NUGhwZ28) | Middle | Science | Explore saturation of a solution and how crystals are formed to remove sugar from maple syrup during the cooling process | -[Reverse Osmosis Short Video](https://drive.google.com/open?id=0B_m8Lfd_tvOLMEt6SE8tUjR4bnc)  -[NHMPA Pressure & Concentration Poster](http://www.nhmapleproducers.com/wp-content/uploads/2016/10/ro-poster.jpg)  -[How Sweet Is Maple Syrup?](http://www.agclassroom.org/ny/resources/maple/HowSweetMapleSap.pdf) |
| [Maple Sugar Molecules and Crystals](https://drive.google.com/open?id=0B_m8Lfd_tvOLdHZBQ051UDJSTTA) | Middle & High School | Chemistry | Students will learn about what sugar crystals look like on a larger scale and how removing water allows for crystallization by making rock candy. | -[Sugar Molecule Short Video](https://drive.google.com/open?id=0B_m8Lfd_tvOLZnhQM0VsODQxR1E)  -[NHMPA Crystallization poster](http://www.nhmapleproducers.com/wp-content/uploads/2016/10/crystallization-of-maple-poster.pdf)  -[Changing State – Evaporation](http://www.middleschoolchemistry.com/lessonplans/chapter2/lesson2) |
| [Sugar Concentration and Hydrometers](https://drive.google.com/open?id=0B_m8Lfd_tvOLZnpYLW5obkd3cWM) | Middle | Science, Engineering | Students will make and test a hydrometer and then use it to test the sugar concentration of different grades of maple syrup. |  |
| [Maple Economics](https://drive.google.com/open?id=0B_m8Lfd_tvOLYWlONnRyUzVFWGs) | High school | Economics | Simulate the relationship between producers and consumers while learning about the New Hampshire maple syrup industry and its competitors. | -[Maple Economics Short Video](https://drive.google.com/open?id=0B_m8Lfd_tvOLYVcwd2V6aU1vdWM)  -[Canadian Maple Heist](https://drive.google.com/open?id=0B_m8Lfd_tvOLTDVNN0xRUjdzZ1U)  -[NHMPA Production poster](http://www.nhmapleproducers.com/wp-content/uploads/2016/10/nh-maple-production-poster.pdf)  -[USDA Maple Statistics](https://drive.google.com/open?id=0B_m8Lfd_tvOLZHQ2MXkzLVh6Qm8) |
| [Tubing Layout Design](https://drive.google.com/open?id=0B_m8Lfd_tvOLME9lTjVBbUp3YlU) | High School | Engineering | Effectively design an efficient tubing system that not only works great, but also is easy to maintain.  Using natural slope and valleys of a hill can help aid a design.  Vacuum pressure is also very important to a maple sugar maker which is touched on in the lesson. |  |
| **ADDITIONAL LESSONS AND MATERIALS** | | | | |
| [Maple Sugaring](https://drive.google.com/open?id=0B_m8Lfd_tvOLVEVQTW54OTU4aEE) | preK-2nd | Language Arts, Math,Science | A variety of crafts, coloring pages and activities. |  |
| [Maple Themed Worksheets 1st](https://drive.google.com/open?id=0B_m8Lfd_tvOLTXF3dUliSnBHTWM) | 1st | Math, Language Arts | A variety of math and language arts worksheets, puzzles, hidden pictures, rebus story and more. |  |
| [Maple Themed Worksheets 2nd](https://drive.google.com/open?id=0B_m8Lfd_tvOLRWMyZGhYWWM0Y28) | 2nd | Math, Language Arts, Social Studies | Maple math with a maple tubing system, tree rings, geography and history are presented in worksheets, hidden pictures and puzzles. |  |

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| **TITLE (link)** | **LEVEL** | **SUBJECT** | **DESCRIPTION** | **OTHER RESOURCES** |
| [Maple Themed Worksheets 3rd](https://drive.google.com/open?id=0B_m8Lfd_tvOLZld1SlNKb085bVk) | 3rd | Math, Science, Language Arts | Puzzles, worksheets, word searches and more featuring plotting coordinates, adjectives, spelling, multiplication and other topics. |  |
| [Maple Themed Worksheets 4th](https://drive.google.com/open?id=0B_m8Lfd_tvOLSDZSQ2dxMFpHNnM) | 4th | Math, Social Studies | Tree parts, tree life cycle, leaf parts, maple production history and decimals are the focus of this set of worksheets. | [Maple History Short Video](https://drive.google.com/open?id=0B_m8Lfd_tvOLc0xGZ3F3WEVOc3M) |
| [Maple Themed Worksheets 5th](https://drive.google.com/open?id=0B_m8Lfd_tvOLLTBLdFFwQWJ0VEE) | 5th | Math, Language Arts | Practice fractions, multiplication and grammar with these worksheets and hidden pictures. |  |
| [Maple Themed Worksheets 6th](https://drive.google.com/open?id=0B_m8Lfd_tvOLTFd2anEwU3ItRGc) | 6th | Math, Science, Language Arts | Graphs, variables, area, ratios, mean, cells & adaptations, phases of matter, grammar and history are addressed in this collection of worksheets. | -[Let’s Graph Maple Production](https://drive.google.com/open?id=0B_m8Lfd_tvOLUm5RZ25RNmJTa3M)  -[USDA Maple Statistics](https://drive.google.com/open?id=0B_m8Lfd_tvOLZHQ2MXkzLVh6Qm8) |
| [Biodiversity in the Sugar Bush & Beyond](https://drive.google.com/drive/u/0/folders/0B_m8Lfd_tvOLUEpldGxjWl8zNHM) | 5th-6th | Science | PowerPoint presentation explaining biodiversity and instructions for the Gobie Game. |  |
| [NYAITC Exploring Maple Syrup](http://www.agclassroom.org/ny/programs/pdf/literacy/lesson08_exploring.pdf) | 4th & 5th | Science, Language Arts | Students will understand how maple syrup is made and use their senses to analyze its qualities. Also works as a companion resource to the book *Sugarbush Springs* by Marsha Wilson Chall. | [Sap In The Sugar Maple](https://vimeo.com/82816054) [Video](https://vimeo.com/82816054) |
| [NYAITC Sugar Maple Days](http://www.agclassroom.org/ny/resources/maple/HowSweetMapleSap.pdf) | 4th & 5th | Science | Learn to identify the maple tree family and that Sugar Maple and Black Maple are the two favored species for maple production. Students will learn how different maple products are made from maple tree sap. They will be exposed to the physics of hydraulic lift and sap flow. |  |
| [Discover How Trees Grow and Function](http://dnr.wi.gov/education/documents/DiscoverHowTreesGrow.pdf) | Upper elementary, Middle | Science | Role-play the growth process of a tree. Learn about tree form and function including photosynthesis. |  |
| [Teacher Treesources](http://www.holdenarb.org/resources/documents/Treesources-watermovementintrees.pdf) | 2nd – 12th | Science | Resources to discover water movement in trees. Link to SMART board activities. |  |
| [All About Maple](https://www.dropbox.com/s/vratyaaef5nhe6e/All%20About%20Maple%20Smart%20Board%20Presentation.notebook) |  | Science, History, Nutrition | Smart Board interactive presentation covering history, tree ID, animals in the sugarbush, maple sugaring season, tapping trees and the tools, nutrition and more. |  |
| [Changing State – Evaporation](http://www.middleschoolchemistry.com/lessonplans/chapter2/lesson2) | Middle | Chemistry | Students will help design an experiment to see if adding energy (heating) affects the rate of evaporation. Look at molecular animations to help explain why the heating water increases the rate of evaporation, introduce a more detailed model of the water molecule and create 3-d Styrofoam models. |  |
| [A Day At Sugar Camp](http://www.woodlandindianedu.com/coloringpages.html) | Ages 4-8 | History | Coloring sheets depicting a variety of native American scenes including some portraying maple production. | -[Woodland Indian Educational resources](http://www.woodlandindianedu.com/onlineresourcesbytopic.html)  -[Book: *A Day At The Sugar Camp*](https://www.amazon.com/Day-at-Sugar-Camp/dp/0615957986) |
| [Maple Legends](https://drive.google.com/open?id=0B_m8Lfd_tvOLWTNIdXJFZGdSSTA) | 3rd-5th | Language Arts, History | Learn about Native American Legends and create your own. |  |
| [Let’s Graph Maple Syrup Production](https://drive.google.com/open?id=0B_m8Lfd_tvOLUm5RZ25RNmJTa3M) |  | Math | Learn to create various graph types based on maple production statistics. | [USDA Maple Statistics](https://drive.google.com/open?id=0B_m8Lfd_tvOLZHQ2MXkzLVh6Qm8) |

**POSTER**

**VIDEOS**

Primary Video

A few time references to help locate specific topics

* history 1:00
* tree ID 2:21
* sap flow 3:21
* collection 5:31
* reverse Osmosis, evaporation & making syrup 7:48
* grading 13:10
* packaging 14:51

Supplementary Segments

* History
* Sugar Molecules
* Economics
* Reverse Osmosis

