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| **LESSON PLAN- PATENTS IMPROVEMENTS IN PAPER MAKING** | **IMPROVEMENTS TO THE FOURDRINIER MACHINE** |
| Background | For thousands of years paper for scrolls, documents and books was hand made from wet wood pulp and hung up to dry-one sheet at a time. The first paper making machine could produce a roll of dry paper which revolutionized the paper making industry and the production of books and newspapers. The first Fourdrinier machine made its way from Europe to South Windham, CT. The Smith and Winchester Company patented many improvements and advancements so they could manufacture the large machines for paper and paper bags sold all over the continent. 22 patents were awarded between 1840 and 1889 to five employees of the company: Spafford, Smith, Binns, Abbe, and Hatch. |
| Objectives | 1) To promote civic pride because such a famous world changing machine is produced and improved in their town or state or country  2)To gain an appreciation for machine produced paper  3) To understand how paper is made  4) To understand the role paper plays in society past and present  5) to develop skills of following directions  6) To examine primary documents on line  Hatch U.S. Patent # 160824 year 1875 |
| Materials | Scrap paper from recycled bins: newspaper, copy paper, colored paper, clean wrappers  Bowl  Fork, spoon, masher  Water  Blender  Window screen- old and discarded  Paper or cloth towels  Scissors |
| Activity | Engage students in Discussion:  How important was paper 100 years ago.  How important is paper today? Why?  How is paper made?  Show Power point #2 on industries  Class Hands-on project  Make paper by hand  Examine Primary Sources:  Connecticut Patents Project Search Results (use Windham or their town or both)  [**http://www.cslib.org/patentres.asp**](http://www.cslib.org/patentres.asp)  Jonathan Hatch’s Patent description and drawing  Discussion of ideas for inventions |
| Notes: | Depending on the size of the group, students can be divided and have two stations. One group will make paper and one group will examine and discuss primary source materials. Switch.  Directions:  Have students rip the papers into tiny pieces about the size of a dime, Put paper in bowl  Add water (1/2 cup at a time, mix, add, mix)  Mix into paper pulp consistency between cookie dough and cake batter  Divide into pieces for each student  Spread and flatten out to be thin ( like a crepe)  If too wet, squeeze out some water with towels  Place on the screen to drip dry, and dry on both sides  Dry overnight, leave as is or cut into square |
| Evaluation | Students that have not had many hands on experiences will be engaged and enthusiastic about making paper by hand. The results (color and texture) will be different every time. |