

Name: School: St. Joseph Elementary School

Grade level: 3rd

Outline	Description
Introduction	<p>The book <u>Letting Swift River Go</u> by Jane Yolen is a great book supplement to the social studies curriculum on Massachusetts in the 3<sup>rd</sup> grade. The story contains many clearly identified problems and design challenges that directly correlate to the social studies topics being studied. It will provide additional background history about the formation of the Quabbin Reservoir and its' effect on society. Through extended lessons and design challenges, it will also correlate with the science unit on plants and animals and their adaptations. In addition the story is presented from the point of view of a young girl which the third grade students can relate to and identify with.</p>
Story title and description	<p><u>Letting Swift River Go</u> is a factually based fiction story about the flooding of the Swift River Valley towns in western Massachusetts in order to create a much needed water supply for Boston and the surrounding communities. The story is told through the direct experiences of a young girl named Sally Jane and tells how her small town was flooded in order to help create the Quabbin Reservoir. It tells the story about how the damming of the Swift River affected herself, her family and her community.</p>
Learning Goals / Outcomes <i>When participating in this activity, students will...</i>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Listen carefully to the story and discuss its main components in order to create a story map</li> <li>• Work cooperatively in groups to utilize the 6 Thinking Hats to generate ideas for discussion as well as to come up with a list of design challenges</li> <li>• Utilize divergent thinking as well as convergent thinking to participate in a brain writing activity to generate ideas, classify them and create a design challenge to tackle.</li> <li>• Create a poster that includes a detailed drawing/ design of how they will solve their design problem</li> <li>• Present their project to the class</li> <li>• Assess the work and effort of their group and provide positive feedback to the other peer groups.</li> </ul>
Prior Knowledge	<p>***The students will have had an extensive amount of practice utilizing the 6 hats of thinking and working through the engineering design process in a variety of lessons and activities that were completed prior to this lesson.</p> <p>In Science the students will have learned :</p> <ul style="list-style-type: none"> <li>• About water supply and demand and how it affects a community and society.</li> <li>• How a reservoir is formed and its' uses and importance</li> <li>• Basic animal and plant adaptations</li> </ul> <p>In Social Studies the students will have learned:</p> <ul style="list-style-type: none"> <li>• Basic map skills and how to construct a map using research</li> <li>• How things have changed and developed over time and how those changes can effect society</li> </ul>
Teacher's Strategy (How will you introduce the project?)	<p>This project will be introduced by reviewing:</p> <ul style="list-style-type: none"> <li>• the use of the 6 hats of thinking,</li> <li>• the initial steps of the engineering design process</li> <li>• the skills needed to use active listening and critical thinking skills while</li> </ul>



	<p>listening to the story</p> <ul style="list-style-type: none"> <li>the rules/expectations of working cooperatively in a group</li> </ul>
Vocabulary	Vocabulary to Discuss: trade-offs, natural resources, reservoir, dam, quench, haul, crossroads, harvest, caissons, eiderdowns
Design Challenges (some problems that you identify in the story)	<p>Design:</p> <ul style="list-style-type: none"> <li>a safer way Sally Jane's family could stay warm in the winter instead of leaving the stove going all day and night</li> <li>an alternate way of providing more water for Boston without destroying all of the towns or at least some of them</li> <li>a way to help prevent the destruction of all the plants and trees that were destroyed as a result of the flooding.</li> <li>something that would prevent the owl from being startled off his perch every night from the loud noise of the train</li> <li>a contraption to collect the syrup from the maple trees that could hold itself up so they didn't need to hold a bucket under it</li> <li>a contraption for holding fireflies for viewing that would also allow the fireflies to escape back to freedom on their own</li> <li>a system for preventing the town of Needham from being flooded in the future to create another "fictional" water supply source.</li> </ul>
Requirements (science and/or math constraint; any other requirements)	<p>The students will be creating a poster that includes the blueprint of their design. The poster must include:</p> <ul style="list-style-type: none"> <li>a list of materials that would be needed to complete their design if they were constructing it with real materials</li> <li>labeled components of the design</li> <li>evidence of the process they used to create their design</li> <li>a link to a science concept we have discussed in class( science topics that students need to incorporate in their project will be provided to the students)</li> <li>participation of all group members</li> </ul>
Selected design challenge to solve	<p>Upon having the students come up with problems they have identified in the story and identifying possible design challenges as a class, the groups will choose from a given set of design challenges that we generated together. In a future activity, all of the students would be required to participate in the design challenge involving their hometown of Needham</p>
Procedure: series of lessons (minimum of 4)	<p>Lesson Plans:*** the following lesson plans may need to be separated into additional days depending upon the make-up and abilities of the given class.</p> <p>Day One</p> <ul style="list-style-type: none"> <li>Make story predictions based on the cover of the book and a selected picture within the story</li> <li>Review any needed vocabulary for further understanding of the story components as well as any needed additional background information about the formation of the Quabbin Reservoir</li> <li>Read the story aloud to the class and discuss its' literature components as a class.</li> <li>Identify the main character, setting, problem and solution through creating a story map as a class</li> </ul> <p>Day Two</p> <ul style="list-style-type: none"> <li>Brainstorm a list of problems in the story that could be solved or made better as a class. Remind the students to think about problems the characters are having and or opportunities to make things better</li> <li>Either narrow down the list to a few design challenges as a class or have</li> </ul>

	<p>the teacher select a specific design challenge for the groups to tackle depending upon the class' abilities.</p> <ul style="list-style-type: none"> <li>• Have the students work in groups on a brain- writing activity. Find evidence in the story to support the need for solving the problem activity to generate ideas on how to work on or solve their challenge. ( Divergent Thinking) Have students write their ideas on post-its so the group can discuss them..</li> <li>• Have students organize their solution ideas into the three categories: ordinary, imaginative/innovative and magical</li> <li>• Have students use convergent thinking to narrow down the ideas and select one that the group will focus on</li> </ul> <p>Day Three</p> <ul style="list-style-type: none"> <li>• Review the requirements and expectations for the design</li> <li>• Have students work cooperatively to make a sketch/ drawing of their solution/design</li> <li>• Have students review their sketch and notes and make necessary adjustments prior to transferring their ideas on the given poster board</li> <li>• Have students work together in their group to complete their poster and make sure all of the specified requirements have been fulfilled. The students will be allowed to decorate their poster with the given materials that will be provided</li> </ul> <p>Day Four</p> <ul style="list-style-type: none"> <li>• Have the students utilize the rubric given to assess their groups work and effort. Make any adjustments necessary before presenting.</li> <li>• Groups present their project to the class</li> <li>• Have a group discussion about all projects that have been presented and give positive feedback</li> </ul>
Extensions	<p>Have the students:</p> <ul style="list-style-type: none"> <li>• Create a map of the former swift river towns and their location in the Swift River Valley</li> <li>• Research the Quabbin Reservoir and identify plants and animals that inhabit that area as well as their needs for survival. ( This could lead to another design challenge involving a habitat for one of the animals)</li> <li>• Research and locate another area of the world in which an area was flooded to create a water supply</li> <li>• Determine where the water comes from in Needham and how it gets to where it needs to</li> <li>• Read the book, <u>A Drop of Water: A Book of Science and Wonder</u> by Walter Wick Use this book to further discuss the uses of a reservoir as well as an introduction to the next science unit on water and it's affect on weather and life forms ( This would directly correspond with additional science frameworks standards)</li> </ul>
Framework Standards	<p><u>Technology/Engineering Standards</u></p> <p>2.1 Identify a problem that reflects the need for shelter, storage or convenience</p> <p>2.2 Describe different ways a problem can be represented, e.g., sketches, diagrams, graphic organizers and lists</p> <p>2.3 Identify relevant design features(e.g., size, shape, weight) for building a prototype of a solution to a given problem</p> <p><u>Science and Technology/ Engineering Curriculum</u> ( This learning standard would be used when an extension lesson on plant life in the Quabbin reservoir was done in conjunction with the 3<sup>rd</sup> grade science unit on plants)</p> <p>Life Science</p> <p>1. Classify plants and animals according to the physical characteristics that they share</p>

	<p>3. Recognize that plants and animals go through predictable life cycles that include birth, growth development, reproduction and death</p> <p>10. Give examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystems.</p> <p><u>English Language Arts and Literacy</u></p> <p>1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers</p> <p><u>Vocational Technical Education Framework: standardized strand 4</u></p> <p>4.C Solve problems using critical thinking</p> <p>4C.o1a Demonstrate skills used to define and analyze a given problem</p>
Thinking Skills	<p>Questioning skills will be emphasized in discussing the story and creating the story map.</p> <p>Analyzing skills will be used in identifying the problems that need to be solved, the solutions and the outcome they might have on people and/or nature</p> <p>Divergent and Convergent thinking skills will be utilized in the given lessons as indicated above</p>
Safety	<p>Since the students will only be making a poster version of their model safety will only pertain to the proper use of the materials given</p>
Materials	<p>Paper, pencils, colored pencils, markers, glue, felt, material scraps, decorative craft supplies, scissors, post-its, large paper, poster board</p>
Assessment method	<p>The students will be assessed on their completion of the story map as well as participation in the class discussions. They will pass in a large piece of paper that has their group's post-its of ideas that have been organized into ordinary, innovative and magical. Their sketch/drawing with adjustments and notes will be collected along with their final project.</p> <p>As a class we will design a rubric for evaluating their final project based on the requirements of the assignment. (When students are involved in designing the evaluation criteria they feel more invested in the project and its outcome)</p> <p>A follow-up assessment will also include a written description of the final project and how it will solve the given problem</p>