

Essential Elements for Project-Based Learning

- ◆ Each activity focuses on team play, creativity and problem-solving skills.
- ◆ Each session includes a challenging problem and a question.
- ◆ The girls engage in a rigorous extended process of asking questions, finding resources and applying information.
- ◆ The B.O.S. Kit Curriculum includes real-world context, tasks and tools that speak to the girls' personal concerns and interests.
- ◆ The girls have a voice and choice about the projects they create.
- ◆ Each session includes time for reflection and evaluation. The girls will focus on what worked, the product quality, and the obstacles and how to overcome them.
- ◆ Each activity includes opportunities for the girls to have open, candid conversations while giving and receiving feedback to improve their process and products.
- ◆ Each activity includes resources and opportunities for the girls to expand their knowledge beyond the classroom

GIRLS PURSUING SCIENCE

Instructional Sequence for Project-Based Activities

Before each session begins, check computers, smart boards, project materials to ensure that everything is working properly, and you have adequate materials to successfully complete the project. Set up your classroom to accommodate groups of no more than four students to a table. If you made the product prior to class, place a table in the front of the room with your product samples nicely displayed. It will help to build excitement!

At the end of each session, the students will use the chemistry concepts they learned in the research section to make cosmetic products. At the end of the curriculum the students will create an ad for their products and develop a business plan.

<p>INTRO 10 - 15 min</p>	<p>Introduce the product for today. If you have made a sample, pass it around so the girls will have an idea of what the finished product will look like. Review the safety and sanitation rules of the lab environment.</p>
<p>THE LAB 45 - 90 min</p>	<p>During the lab, students may work alone or in groups. In a group setting, each group of girls form a team and each member of the team have a specific role and responsibilities. After the instructor briefly explains each of the roles, students choose what team roles they want to fill. The roles are:</p> <ul style="list-style-type: none"> • Lab Scientist: Responsible for leading the group projects and assigning responsibilities to each girl (some students may share assignments, if necessary), ensuring that the group has adequate supplies, cleaning assignments, etc. • Physicist: Responsible for leading the mathematical sections and ensuring that the formulations for the group are calculated correctly. • Research Scientist: Responsible for leading the group in research and finding information about the materials, ingredients and procedures used during the experiments and ensuring that the resources are credible. • Chemist: Guides the group through the procedures and steps to mix and make products. <p>Students should follow the steps in the order in which they appear in the B.O.S. Lab Manual. Be sure to have students read the entire lab section PRIOR to completing anything in the lab.</p>
<p>WRAP-UP</p>	<p>After each project completion, the girls will review their final product and complete the analysis and conclusion section. Each girl should be able to answer the questions about their experiment and discuss the outcomes with the class. Clean up. Observe and discuss progress in the group.</p>