

BEST High School
Green Sustainable Design and Technology / SCI641
Daniel Weiss
Email: dweiss@lwsd.org
Competency-based Syllabus

Desired Results

Credit: .125 per session

Estimate of hours per week engaged in learning activities: 5 hours (core 4 hours)

Course Overview:

Green Sustainable Design and Technology (GSDT) course will focus on active learning of Science, Technology, Engineering, and Math (STEM) concepts relating to the environmental problems of the 21st century. Students will learn about the technology and design concepts that relate to sustainable living through direct instruction, regular interaction with scientists and industry experts, and active engagement in solving of current and pressing environmental issues.

Our hands-on, industry based curriculum prepares students to learn and apply scientific concepts & skills enabling them to:

1. *Understand the nature of sustainability and the interrelationships among humans, the built environment, and the natural world.*
2. *Conduct labs and experiments to explore and participate in the various green technologies in use and design in the real world today*
3. *Develop solutions to “real world” problems.*

We explore sustainable design technologies within the following main areas:

- Sustainability 101
- Residential (Homes) and Commercial Buildings (Office and Stores)
- Transportation
- Energy (Focus and Solar and Wind)
- Food and Agriculture
- Ecosystems

In the spring, we have the opportunity to participate in *Imagine Tomorrow*, a sustainable design competition hosted by the Washington State University in Pullman, Washington.

Instructional Materials: - There is no textbook for this class. Reading materials and links for online resources will be supplied to students and posted on the Communicator webpage.

Semester 1:

Session 1 (9/6 – 10/4) – Sustainability 101. What does Green and Sustainable Really Mean?

Session 2 (10/5 – 11/4) – Sustainability in the Workplace

Session 3 (11/7 – 12/9) – Green Buildings

Session 4 (12/12 – 1/27) - Transportation

Semester 2:

Session 5 (1/30 – 3/2) – Renewable Energy - Solar

Session 6 (3/5 – 3/30) - Renewable Energy - Wind

Session 7 (4/9 – 5/11) – Sustainable Agriculture

Session 8 (5/14 – 6/22) – Ecosystems

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All summative assessments are due by 1 pm two school days before the end of session
All coursework is aligned with the Washington State and District EALR's
Students earn credit for proficient completion of each session's summative assessments

Washington State: K-12 Integrated Environmental and Sustainability Education (ESE) Learning Standards

Standard 1: Ecological, Social, and Economic Systems

Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.

Standard 2: The Natural and Built Environment

Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.

Standard 3: Sustainability and Civic Responsibility

Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.

Session	Learning Target	Formative	Summative
1	<p>ESE Learning Standards 1, 2, and 3</p> <p>Students will be able to define what sustainable and sustainability mean and be able to discuss the complexity of the term.</p> <p>Students will be able to describe Systems Thinking and Analysis and be able to begin to apply this type of thinking in their determinations of sustainability.</p> <p>Students will develop tools and questions to analyze products and actions to determine if they are</p>	<p>Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project.</p> <p>At the mid-point of the session have students write a self-assessment of their progress in their notebooks.</p>	<p>Write paper or make a presentation with visual (poster, PowerPoint) describing sustainability, systems thinking, Cradle-to-Cradle, and how changes occur to the built and natural environment.</p>

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	<p>sustainable or not.</p> <p>Students will understand and be able to describe the concept of “Cradle to Cradle” and evaluate products and actions to determine if they meet this standard.</p> <p>Students will understand the changes that occur to the built environment and to the natural environment. Students will be able to analyze relationship between humans and the changes to the built and natural environment.</p> <p>Students will begin to understand the connections to careers in green and sustainable technology.</p>		
<p>2</p>	<p>ESE Learning Standards 1, 2, and 3</p> <p>Students will apply their understanding of sustainability to the workplace. They will be able to apply that understanding to a real-world sustainability audit of a local school or office in which students evaluate conditions in the sample workplace and present an analysis of workplace sustainability.</p>	<p>Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project.</p> <p>At the mid-point of the session have students write a self-assessment of their progress in their notebooks.</p>	<p>Students will complete a sustainability audit of a local school or workplace. They will create a protocol, then evaluate conditions in the sample workplace, and present an analysis of workplace sustainability to the class and the school/business.</p>
<p>3</p>	<p>ESE Learning Standards 1, 2, and 3</p> <p>Students will apply their understanding of sustainability to buildings (residential and</p>	<p>Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project.</p>	<p>Students will show their understanding of sustainable building design (residential and/or commercial) by designing a model sustainable building. Along with the</p>

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	commercial). They will be able to apply their knowledge by designing a model sustainable building along with an analysis of sustainability features in the model.	At the mid-point of the session have students write a self-assessment of their progress in their notebooks.	model, an analysis of sustainability features used in the design will be required.
4	ESE Learning Standards 1, 2, and 3 Students will apply their understanding of sustainability to transportation. Students create a transportation plan for a local city and present their findings to the local transportation board.	Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project. At the mid-point of the session have students write a self-assessment of their progress in their notebooks.	Students will show their understanding of sustainable transportation by designing a transportation plan for a local city. In addition to the transportation plan, the with the model, an analysis of sustainability features used in the design will be required.
5	ESE Learning Standards 1, 2, and 3	Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project. At the mid-point of the session have students write a self-assessment of their progress in their notebooks.	TBD
6	ESE Learning Standards 1, 2, and 3	Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project. At the mid-point of the session have students write a self-assessment of their progress in their notebooks.	TBD

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7	ESE Learning Standards 1, 2, and 3	Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project. At the mid-point of the session have students write a self-assessment of their progress in their notebooks.	TBD Imagine Tomorrow
8	ESE Learning Standards 1, 2, and 3	Collect and grade science notebook with in-class and homework assignments. Assignments will include homework, in-class labs, and progress on the summative assessment project. At the mid-point of the session have students write a self-assessment of their progress in their notebooks.	TBD

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Types of Learning Activities

[This chart demonstrates the types of learning activities the student will complete throughout the course]

Direct Instruction	Indirect Instruction	Experiential Learning	Independent Study	Interactive Instruction
___ Structured Overview ___ Mini presentation ___ Drill & Practice ___ Demonstrations ___ Other (List)	___ Problem-based ___ Case Studies ___ Inquiry ___ Reflective Practice ___ Project ___ Paper ___ Concept Mapping ___ Other (List)	___ Virt. Field Trip ___ Experiments ___ Simulations ___ Games ___ Field Observ. ___ Role-playing ___ Model Bldg. ___ Surveys ___ Other (List)	___ Essays ___ Self-paced computer ___ Journals ___ Learning Logs ___ Reports ___ Directed Study ___ Research Projects ___ Other (List)	___ Discussion ___ Debates ___ Role Playing ___ Panels ___ Peer Partner Learning ___ Project team ___ Laboratory Groups ___ Think, Pair, Share ___ Cooperative Learning ___ Tutorial Groups ___ Interviewing ___ Conferencing ___ Other (List)