

Connecting Technology/Engineering with PLT Using “Design Challenges” and Biomimicry

Science Content	PLT Activities	Suggested Design Challenge
Climate, Environmental Impacts, Forest Ecosystems	<p>Main Activity - Activity 96: Improve Your Place</p> <p>Related PLT Activities - Activity 84: The Global Climate Activity 30: Three Cheers for Trees</p>	<p><u>Design Challenge:</u> Propose a Climate Change Mitigation Technology for your community that mimics the function of a natural forest.</p> <p>For ideas, see “Trees and Climate Change” http://www.greenleaftrees.co.uk/section.php/22/1/trees_and_climate_change</p>
Environmental Impacts, Natural Resources, Watersheds,	<p>Activity 55: Planning the Ideal Community</p> <p>Related PLT Activity - Activity 44: Water Wonders (Water Cycle)</p>	<p><u>Design Challenge:</u> Incorporate “Low Impact Development” Ideas, which mimic how natural watersheds work, into plans for a new subdivision.</p> <p>For ideas, see Creating Sustainable Cities http://www.usa.siemens.com/sustainable-cities/</p>
Heat transfer, Evaporation, Ecosystems	<p>Activity 73: Waste Watchers</p> <p>Related PLT Activities - Activity 96: Improve Your Place Activity 39: Energy Sleuths</p>	<p><u>Design Challenge:</u> Propose changes in your community that reduce energy use by mimicking how plants affect the surrounding temperature.</p> <p>See “Landscaping for Energy Conservation” http://www.ext.colostate.edu/pubs/garden/07225.html</p>
Science Content	PLT Activities	Suggested Design Challenge
Plant Needs, Soil, Plant Life Cycles, Succession, Microclimates	<p>Main Activity - Activity 80: Nothing Succeeds Like Succession</p>	<p><u>Design Challenge:</u> Plan an Edible Forest Garden that mimics a young deciduous forest.</p>

	<p>Related PLT Activities -</p> <p>Activity 24: Nature's Recyclers</p> <p>Activity 70: Soil Stories</p> <p>Activity 41: How Plants Grow</p> <p>Activity 13: We All Need Trees</p> <p>Activity 16: Please Pass the Plants</p> <p>Activity 48: Field, Forest, Stream (microclimates)</p>	<p>For ideas, see "Edible Forest Gardening"</p> <p>http://www.coq.ca/uploads/TCOG_Articles/Edible Forest Gardens.pdf</p>
<p>Renewable and Nonrenewable Resources, Environmental Impacts, Recycling</p>	<p>Main Activity -</p> <p>Activity 82: Resource Go-Round</p> <p>Related PLT Activities -</p> <p>Activity 15: A Few of My Favorite Things</p> <p>Activity 14: Renewable or Not</p> <p>Activity 36: Pollution Search</p> <p>Activity 37: Reduce, Reuse, Recycle</p> <p>Activity 52: A Look at Aluminum</p>	<p><u>Design Challenge:</u></p> <p>Use a Product Life Cycle Assessment of one of "your favorite things" to suggest how mimicking nature could reduce generation of "wastes" during its manufacturing or disposal.</p> <p>See the "Product Development and the Environment" activity downloadable at http://www.teachengineering.org/view_activity.php?url=collection/cub_/activities/cub_life/cub_life_lesson01_activity1.xml</p>
<p>Science Content</p>	<p>PLT Activities</p>	<p>Suggested Design Challenge</p>
<p>Animal Needs, Natural Resources, Biomimicry</p>	<p>Main Activity -</p> <p>Activity 75: Tipi Talk</p> <p>Related PLT Activities -</p> <p>Activity 17: People of the Forest</p>	<p><u>Design Challenge:</u></p> <p>Design a human shelter inspired by an animal "home", using natural materials.</p> <p>See the "Live Like an Animal" activity at: http://www.teachengineering.org/view_activity.php?url=collection/cub_/activities/cub_lifescience/cub_lifescie</p>

	Activity 92: A Look at Lifestyles	nce_lesson03_activity1.xml
Water Cycle, Evaporation	<p>Main Activity - Activity 44: Water Wonders (Water Cycle)</p> <p>Related PLT Activity - Activity 36: Pollution Search (Water Pollution)</p>	<p><u>Design Challenge:</u> Conduct the International Year of Chemistry "Solar Stills Challenge" to design a way to use evaporation to get fresh water from saltwater.</p> <p>See details at: http://www.chemistry2011.org/system/documents/110/original/Solar_Stills_Challenge_25-01-2011.pdf?1296685856</p>
Heat transfer, Adaptations	<p>Main Activity - Activity 10: Charting Diversity (Focus on adaptations to heat.)</p>	<p><u>Design Challenge:</u> Design and construct a model house mimicking how forest creatures stay cool.</p> <p>http://ecologyexplorers.asu.edu/docs/explorers/lesson_plans/engineering_student.pdf</p>
Science Content	PLT Activities	Suggested Design Challenge
Properties of Materials	<p>Main Activity - Activity 51: Make Your Own Paper</p> <p>Related PLT Activities - Activity 37: Reduce, Reuse, Recycle Activity 83: A Peek at Packaging</p>	<p><u>Design Challenge:</u> Design a "pop up" greeting card using scrap and handmade papers.</p> <p>For basic instructions, see http://familyfun.go.com/crafts/pop-up-greeting-card-667569/</p>