Sustainable Sites Assessment Activity

As part of the <u>Sustainable Sites Curriculum Toolkit</u> this document provides an overview, learning objectives, and suggested logistics for incorporating a <u>Sustainable Sites Assessment</u> activity into a course. The goals for the activity are to expose students to sustainable land design, development and management in their local built environment championed by their institution and the local community; develop their ability to identify sustainable site measures and assess performance for sustainability features grounded in the SITES rating system; and introduce them to the SITES certification review process for a potential career selection, such as becoming a sustainability consultant.

This activity guides students in the hands-on analysis of a project site by studying a real landscape project, identifying sustainable strategies, and diving into the SITES prerequisites and credits to assess how a project achieved (or could achieve) SITES v2 certification. By providing experiential learning activities you make abstract concepts tangible and develop skills desired by employers. In one survey 93% of employers cared more about "critical thinking, communication, and problem-solving skills" than an undergraduate's concentration. They need hires who can take on multiple responsibilities, which requires flexibility and a plethora of skills." (Source: AACU 2013 Employer Survey).

This activity is appropriate for undergraduate or graduate students in a wide range of disciplines (e.g. landscape architecture, horticulture, ecology, civil engineering, environmental science, construction management, environmental engineering, architecture, etc.) and can be adapted for class size, focus, and project access.

This activity can be a used in conjunction with the LEED v4 BD+C Green Building Assessment Activity (from the <u>Green Building Design and Construction Curriculum Toolkit</u>) The analysis will identify which LEED prerequisites and credits align with the project. (Reference material: <u>Synergies between SITES and LEED</u>)

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Faculty Guide

This Sustainable Sites Assessment can be applied to various sites on campus or in the local community. It can be used on projects that are or are not already SITES certified. While this activity focuses on SITES v2 concepts and credits, a project certified under a previous version of SITES can still be applied to the assessment component of this activity.

This activity is appropriate for undergraduate or graduate students in a wide range of disciplines (e.g. landscape architecture, horticulture, ecology, civil engineering, environmental science, construction management, environmental engineering, architecture, etc.). As the instructor, we encourage you to determine the required outcome of the assessment based on the course goals and learning level. The activity can be flexible depending on the class size, focus, and project access.

Review the concepts addressed in the activity as a guide for items you will want to make sure the students are familiar with in order to be successful with the activity.

Proposed Learning Objectives:

- Identify sustainable sites and SITES v2 rating system concepts and strategies as they appear in an actual project location
- Propose actions that can be taken to address sustainable sites strategies or identify decisions made during the project's life that contribute to SITES certification
- Recognize the synergies among SITES credits
- Identify credit alignment between SITES and LEED

Activity options:

- Students complete as many parts of this activity as appropriate for the course time, structure, and learning goals
- Cut and paste the instructions and materials from this document or use as models to create your own materials (e.g., spreadsheet templates for students to gather and build their data as they proceed through their assessment of the project)
- Students choose a local project or are assigned one
- Assign the same project location to the class and divide up the categories among the students (working in groups or individually) or assign different projects to students (again working in groups or individually)
- Students share their findings as a presentation (to class or relevant stakeholders) or create a brochure, signage, tour, etc. to promote the sustainable features to community members

Contents:

- Part I Project Information
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- Part IV Synergies and Tradeoffs
- Part V Taking SITES Further
- Part VI –Synergies between SITES and LEED

Student Guide

These materials provide guidance and support for completing a *Sustainable Sites Assessment* on campus or in the local community. This activity provides you with hands-on experience assessing a landscape project. It guides you through the analysis of a project by studying a real site, identifying sustainable strategies, and diving into the SITES prerequisites and credits to assess how a project achieved (or could achieve) SITES certification.

Part I – Project Information

Objective: Gather relevant information for a landscape project.

Overview: Gather background information about the project to set the foundation for further research.

The following information sources may be useful in completing this section:

- Website
- Conversations with project team members and stakeholders
- Observation of the site
- SITES Project Directory: http://www.sustainablesites.org/directory
- Landscape architecture/design firm website
- Online search and images such as:
 - o Google Earth historical imagery tool
 - World Wildlife Fund Wildfinder: https://www.worldwildlife.org/pages/wildfinder
 - o NRCS Web Soil Survey: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
 - o FEMA Flood Mapping tool: https://www.fema.gov/flood-mapping-products
 - o National Wetland Inventory: https://www.fws.gov/wetlands/data/mapper.html

Project information to gather

Project name:
Address:
Total site area:
Site context:
Usage:
Total number of site users:
Operating hours, if applicable:
New construction or major renovation:
Former land use:



Terrestrial biome:
Project images:*
Project Stakeholders (i.e., owner, project team members, facility manager, neighbors, public officials, local community/businesses, site users):
Project boundary:
Total area of water bodies within boundary:
Pre-construction vegetated area:
Final design vegetated area:
Copy of project site plan (if available):
Budget (If available):
SITES Certification:
□ N/A
☐ Currently registered (version:)
☐ SITES Certified
Year: Version: Certification level:
Is the project pursuing LEED Certification?
□ N/A
☐ Registered (version:)
☐ LEED Certified
Year: Version: Certification level:
Date construction began (month/year):
Date project was completed (month/year):
General description of project:

*If taking photos from a public source, you will need to identify permission restrictions and may need to contact the owner to secure the right to use these in your work; always provide a citation for photographs taken by someone other than you. Alternatively, you may choose to visit the project and take your own photographs.



Part II – Sustainable Site Audit

Objective: Identify sustainable sites concepts and strategies on an actual project site

Overview: Research a project and identify which sustainable site concepts are evident. For each concept that is evident, describe the feature(s) that address this concept and their impact on the environment and/or site users. You will be able to identify some concepts by observing or touring a site. Other aspects you may need to assess by reviewing websites, public documents, or talking to project stakeholders (e.g., design team, owner, site manager, etc.)

When assessing a landscape project, think about synergies and trade-offs. Synergies are beneficial interrelationships between components or systems in the site; together, these maximize performance (e.g., conserving native plants and using appropriate plants within the landscape design will reduce or even eliminate the demand for on-site irrigation). Trade-offs are balancing incompatible outcomes (e.g. designing onsite spaces to support physical activity, such as including playgrounds and fitness equipment, may result in increased areas of hardscape.)

As you start, think about these general questions:

- What features would you expect to find in the site that would benefit the owner and/or the users of the space?
- How can the operations and maintenance of the site affect the users, surrounding environment and community?



SITE CONTEXT

The context of where a project is located and developed is very important. A sustainable site requires careful planning and the protection of existing, functioning natural features that are unique, critical, sensitive, or threatened, such as farmlands, floodplains, wetlands, and wildlife habitats. These features provide essential ecosystem functions for wildlife, site users, and the surrounding community.

As you start to assess the site, think about these questions:

- What was the previous use of this site?
- How does this site's surrounding area contribute to reducing pollution, improving human health and well-being, and supporting local economies and communities?
- Does the site include sensitive or critical areas that would benefit from protection?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
Farmland has been identified and protected		
100-year floodplains have been identified and their functions (i.e., storage, habitat, water quality benefits) have been protected		
Naturally occurring aquatic ecosystems (i.e., wetlands), have been identified and protected		
Habitats for threatened and/or endangered species have been identified and protected		
If the site, or portions of the site, qualify as brownfield, appropriate remediation has been completed		
The location is within an existing developed area and close proximity of existing water and wastewater infrastructure and basic services for site users		
The site is well connected to alternative transportation options, including pedestrian, bicycle, and mass-transit networks		



PRE-DESIGN ASSESSMENT AND PLANNING

Before design begins, an integrated design team must conduct a comprehensive site assessment of existing physical, biological, and cultural conditions that will inform planning and design. This team must include experts in natural systems, design, construction, and maintenance, in addition to representatives of the community, the owners, and the intended site users.

As you start to assess the site, think about these questions:

- How did all members of this project team work together on the design/construction/and occupancy phases of this site?
- Which stakeholders were involved in the planning?
- How did a site assessment of this location influence the final design decisions?
- Would the project benefit from the involvement of additional experts or specialists?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
Project teams applied an integrative process		
throughout all phases of design and		
construction		
A pre-design site assessment identified		
opportunities to protect and improve		
ecosystem services and use sustainable		
strategies during project design, construction,		
and maintenance phases		
Existing sensitive features onsite have been		
identified and sufficiently protected via the		
establishment of Vegetation and Soil		
Protection Zones		
Site users and stakeholders provided input on		
programmatic and functional needs during		
the site assessment and design process		



WATER

Natural systems are of critical value for their ability to store, clean, and distribute available water. This section encourages projects that are designed to conserve water, maximize the use of precipitation, and protect water quality. For example, a sustainable project may harvest rainwater on site and use it, rather than potable water, for irrigation and water features. The goal is to incorporate strategies and technologies that restore or mimic natural systems.

As you start to assess the site's water use, think about these questions:

- What are the sources of water for this site?
- How is water used on this site?
- Is rainwater collected and repurposed? Is it treated as a resource or amenity versus as waste?
- Where can non-potable water be used in place of potable water?
- Does the design prioritize practices that mimic natural systems?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
Precipitation volumes were analyzed and		
onsite management (infiltration,		
evapotranspiration, and/or reuse) was		
applied to reduce runoff		
Strategies to reduce or eliminate the need for		
landscape irrigation were developed to		
reduce or eliminate potable water usage		
Green infrastructure and low-impact design		
strategies are used to manage nearly all		
precipitation volumes by retaining and/or		
treating this water onsite		
Outdoor potable water use is significantly		
reduced or eliminated for irrigation and		
created water feature needs		
Stormwater is treated as an amenity via		
management elements that are visually and		
physically accessible to site users		
Degraded, damaged or destroyed naturally		
occurring aquatic ecosystems have been		
identified on site and restored		



SOIL + VEGETATION

Proper soil management is an important design element and construction priority. In addition to serving as the foundation for robust vegetation, healthy soils filter pollutants and help prevent excess runoff, erosion, sedimentation, and flooding. Incorporating sustainable site strategies can reduce or eliminate landscape irrigation, increase the quality of wildlife habitat, promote regional identity, and reduce maintenance needs.

As you start to assess the site's soil and vegetation, think about these questions:

- What specific soil characteristics must be replicated for native plants to thrive?
- What areas within the site include healthy, disturbed or severely disturbed soils?
- How does the site prevent excess runoff, erosion, and flooding?
- What is the vegetation on the site? What wildlife habitat is on the site?
- How might construction activities impact healthy soils and vegetation?

	EVIDENT	DESCRIBE THE FEATURE(S)
SUSTAINABLE SITE CONCEPT	(choose one:	ADDRESSING THIS CONCEPT AND THEIR
	yes, no, not sure)	IMPACT
A soil management plan exists to minimize soil		
disturbance and ensure proper soil treatment		
and restoration practices		
The site removed and manages invasive plants		
Only plants that are appropriate for site		
conditions, climate, and design intent are used		
The disturbance of existing appropriate plants		
and healthy soils is limited during construction		
and operations		
Measures are in place for the protection and		
ongoing maintenance of special status trees		
and other plants		
The site conserves and/or installs plants that		
are native to the site's ecoregion		
The site conserves and/or restores native		
plant communities to replicate regional plant		
community species and abundance		
The vegetation biomass on site is conserved		
and/or restored to a level appropriate to the		
terrestrial biome identified for the site		
Paved areas as well as roof surfaces, are		
reflective and light in color, and/or shaded by		
vegetation or structures that produce		
renewable energy		
Vegetation and/or shading is used to reduce		
costs associated with indoor climate control		
The site is designed to minimize the risk of		
catastrophic wildfire		



MATERIALS

Appropriate selection and use of materials can contribute to a project's ability to support and enhance ecosystem services on the site and wherever the material exists throughout its life-cycle. The demolition, selection, procurement, and use of materials in site design and construction present considerable opportunities to decrease the amount of materials sent to landfills, to preserve natural resources, to reduce greenhouse gas emissions, and to support the use of sustainable building products.

As you start to assess the site's materials, think about these questions:

- Which existing materials on site can be salvaged or reused?
- What type of materials were used in the construction of this site?
- What types of products and materials are needed for the ongoing operation and maintenance of this site?
- Can installation methods help make the site a more flexible or adaptive space for future uses?
- What impact can material selection have on driving the industry to create more sustainable products?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
Wood products are only from non- threatened tree species		
Existing on-site structures and paving have been maintained and/or reused in place		
Material assemblies, products, or product components are designed for disassembly and facilitate reuse		
The site reused salvaged materials and plants		
Materials with recycled content are installed		
onsite		
Materials are extracted, harvested,		
recovered, and manufactured regionally		
Materials purchased for the project have		
been extracted and sourced in a responsible		
manner		
Materials used have available chemical		
inventories, life-cycle information, and		
hazard assessments		
Materials used in the project have been		
manufactured in a sustainable manner		
Plants purchased have come from businesses with sustainable plant production practices		



HUMAN HEALTH + WELL-BEING

Any access to nature, whether in a park or natural area, or simply viewing green space during daily life, positively affects mental health and facilitates social connection. These effects are essential to healthy human habitat and extend to include positive physical health outcomes. A sustainable site promotes outdoor opportunities for physical activity, restorative and aesthetic experiences, and social interaction. It also encourages projects to address social equity in their design and development choices.

As you start to assess the site, think about these questions:

- Is the site convenient to access and simple and intuitive to navigate?
- How does the site encourage social interaction?
- What physical health outcomes does this site support?
- Does the site's design and development address social equity?
- How do you feel in this site?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
Significant historic buildings, structures, and		
objects, as well as cultural landscapes have		
been identified on site and are protected		
Accessibility, safety, and wayfinding are		
incorporated in the site design		
The site provides a variety of publicly		
available on-site events, facilities, amenities,		
or programming		
The site offers accessible, quiet outdoor		
spaces with seating and visual and physical		
access to vegetation		
Outdoor physical activity is encouraged via		
onsite programs, features and amenities		
Outdoor gathering spaces allow people to		
gather, eat, work, or play together		
On-site food production is available for		
education or distribution to site users and the		
community		
Lighting is controlled to reduce nighttime		
light pollution		
The site offers options for efficient and		
adaptable modes of transportation		
Smoking is prohibited or only allowed in		
designated areas		
The project hired local workers and		
supported local businesses during		
construction		



CONSTRUCTION

Sustainable construction practices start with ensuring that contractors are aware of sustainability goals set in the initial design phase. Then, proper actions can be taken through the construction phase. Projects must protect air quality through low-emitting equipment, strive for a net-zero waste site, ensure healthy vegetation through soil restoration strategies, and protect receiving waters from polluted runoff and sedimentation.

As part of your assessment, think about these questions:

- How did the construction phase of this project include sustainable strategies?
- Were efforts made to reduce construction waste and divert waste from landfills?
- Did plans, specifications and construction staff communicate sustainability goals?
- How did proper planning prior to construction reduce environmental impacts?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
Sustainable construction practices and goals		
were communicated to all disciplines via		
specifications, drawings and designated		
responsible parties prior to construction		
An erosion, sedimentation and pollutant		
control plan was established and		
implemented onsite during construction		
Soils disturbed during construction have been		
restored and tested to confirm that		
characteristics and performance criteria		
needed to support vegetation have been		
achieved		
Soils disturbed by previous development		
have been restored and tested to confirm		
that characteristics and performance criteria		
needed to support vegetation have been		
achieved		
Construction waste was diverted from landfill		
Reusable vegetation, rock, and soils waste		
generated during land-clearing was retained		
for local or onsite use		
The impact of diesel engines used on site		
during construction were minimized		



OPERATIONS + MAINTENANCE

A sustainable site includes maintenance strategies that maximize the site's long-term potential in providing ecosystem services. Strategies include reducing material disposal, ensuring long-term health of soil and vegetation, reducing pollution, conserving energy, and encouraging the use of renewable energy.

As part of your assessment, think about these questions:

- Why is it important to establish maintenance and management strategies?
- What are the benefits of developing operations and maintenance strategies prior to construction completion?
- Which maintenance strategies can offer cost savings to project owners?
- What are the management practices used to ensure long-term health of the site?
- Does the project have existing staff to meet maintenance needs?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
A collaborative approach was used to prepare a site maintenance plan for outlining short and long-term sustainable strategies and responsible parties		
Spaces are designated for the collection and storage of recyclable materials		
Organic matter generated by vegetation trimmings or food waste is locally composted		
Synthetic pesticide and fertilizer use is minimized or eliminated		
Outdoor lighting and other site equipment are selected to reduce energy usage		
The site uses renewable energy systems to meet outdoor site electricity needs		
The use of gasoline-powered landscape maintenance equipment is minimized or eliminated		



EDUCATION + PERFORMANCE MONITORING

Sustainable sites make efforts to inform and educate the public about the project goals and sustainable practices implemented in site design, construction, and maintenance. It also creates an incentive to monitor, document, and report the performance of the site over time in order to influence and improve the body of knowledge in site sustainability.

As part of your assessment, think about these questions:

- What are ways people can learn about the sustainable strategies for this site?
- How is the performance of the site monitored and documented over time?
- What are the benefits of long-term data collection and monitoring?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
Interactive or interpretive educational		
elements have been implemented to draw		
attention to and explain sustainable features		
or processes		
A case study illustrating the approaches,		
strategies, and benefits of the site is publicly		
available		
A plan is in place for ongoing performance		
monitoring and reporting of sustainable		
features		

INNOVATION OR EXEMPLARY PERFORMANCE

There are additional sustainable site strategies that demonstrate exemplary performance above and beyond standard targets. An innovative sustainable site will develop or pursue sustainable practices or meet benchmarks for sustainable performance beyond the expected standards.

As part of your assessment, think about these questions:

- What sustainable site strategies are unique or innovative?
- How has this site exhibited exemplary performance in sustainable practices?

SUSTAINABLE SITE CONCEPT	EVIDENT (choose one: yes, no, not sure)	DESCRIBE THE FEATURE(S) ADDRESSING THIS CONCEPT AND THEIR IMPACT
The site incorporates a sustainable strategy		
that is unique or innovative, or has		
demonstrated performance that significantly		
exceeds a noted sustainable site concept		



Part III – SITES Credits in Action

Objective: Identify strategies that achieve SITES credits in an actual landscape project

Overview: Building on your assessment in Part II, identify the features that would meet the related SITES credit requirements. Clarify how the feature or strategy would meet the SITES credit and how many points it would have earned.

Use the <u>SITES v2 Rating System</u> to look up the requirements for the credits. Download the <u>SITES v2 Scorecard</u> and complete it for this project. Indicate if a prerequisite was met. For credits, fill in how many points would have been earned. Look at the total at the end and determine what certification level this project could achieve.

If the project team's actual SITES scorecard is available, check to see how many credits and points were also identified in your assessment and the total number of points that were achieved. If the project does not have a scorecard, determine whether it could have been certified or what other measures could be taken for it to be certified.

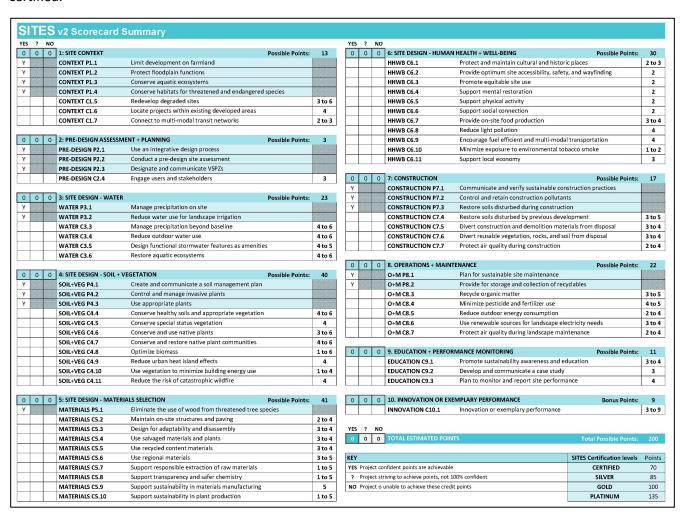


Image of project scorecard



Part IV – Synergies and Tradeoffs

Objective: Recognize the synergies among SITES credits

Overview: When assessing a sustainable landscape project, consider synergies and trade-offs. Synergies are beneficial interrelationships between components or systems in the site; together, these maximize performance (e.g., conserving native plants and using appropriate plants within the landscape design will reduce or even eliminate the demand for on-site irrigation). Trade-offs are balancing incompatible outcomes (e.g. designing onsite spaces to support physical activity, such as including playgrounds and fitness equipment, may result in increased areas of hardscape.)

It is important to think about the connections between SITES credits and strategies to maximize the performance of a landscape project.

As you review a project, think about these questions:

- How does one decision made for the project impact other decisions, strategies, or SITES credits?
- How does an integrative approach to site design and management identify synergies and tradeoffs?

Use the chart below to track synergies or tradeoffs between sustainable strategies in the project. Identify areas where one decision has (or would) impact another decision. For example, if functional stormwater features are designed as amenities, will this impact the volume of stormwater that can be managed on site? Use the outcome of your assessment to identify where and how to use an integrative process with other project team members to maximize synergies or address tradeoff concerns.

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	Site Context	Pre-Design Assessment & Planning	Site Design - Water	Site Design – Soil + Vegetation	Site Design - Materials Selection	Site Design – Human Health and Well-Being	Construction	Operations and Maintenance	Education and Performance Monitoring	Innovation or Exemplary Performance
Site Context										
Pre-Design Assessment & Planning										
Site Design - Water										
Site Design – Soil + Vegetation										
Site Design - Materials Selection										
Site Design – Human Health and Well-Being										
Construction										
Operations and										
Maintenance										
Education and Performance Monitoring										
Innovation or Exemplary Performance										



Part V – Taking SITES Further

Objective: Propose design decisions to address sustainable sites strategies and achieve SITES credits for a landscape project.

Overview: Using your assessment in Part II and III, and recognizing any synergies or trade-offs in Part IV, identify where you believe the project could improve on its work to increase their sustainability impact and enhance their total SITES certification score. Assess the entire project or focus or specific credit(s). Review the relevant SITES credits and propose additional strategies the project could incorporate. Identify the relevant project stakeholders involved, work needed, benefits to the project, budget considerations, synergies or trade-offs with other areas, etc.

Prepare a report or presentation which identifies SITES v2 credits/points you think the project is likely to achieve, any obstacles that would prevent prerequisite achievement, and strategies that could be pursued for additional credits/points.



Part VI –Synergies between SITES and LEED

Objective: Identify credit alignment between SITES and LEED

The <u>SITES</u> and <u>LEED</u> rating systems are complementary, and can be used independently or in tandem. A project can benefit from certifying to both SITES and LEED and take advantage of the synergies between them. The LEED rating system applies to a project building and the site it is located on, while the SITES rating system applies to everything on the site, except the building (with a few exceptions).

Use your analysis from Part V which identifies SITES v2 credits/points you think the project is likely to achieve and proposed strategies that could be pursued for additional credits/points. Then use the Synergies between SITES and LEED document to identify which credits/points also can be used for LEED certification.

This activity could also be done with the analysis of a building project for LEED certification. Study a real building, identifying green building strategies, and diving into the LEED credits to assess how a project achieved (or could achieve) LEED certification. Then use the Synergies between SITES and LEED document to identify which credits/points can also be used for SITES certification.

Prepare a report or presentation which identifies the synergies between SITES and LEED for a project.