LEED for Neighborhood Development
Activity #1
Before completing this Activity Read: Reference Guide for Neighborhood Development v4 – Pages 4-58

Fill-In, Multiple Choice, Matching

1. Green __neighborhoods__ are an integral part of the solution to the environmental challenges facing the planet.

2. This pattern of extraction, use, and disposal has hastened depletion of finite supplies of nonrenewable energy, water, and materials and is accelerating the pace of our greatest problem— __climate change__.

3. More than half of the world's population now lives in __urban__ rather than __rural__ areas, and the urban share is predicted by the United Nations to rise to 70% by 2050, with the emergence of megacities of 10 million to 20 million people.

4. At the neighborhood level, these "drawing boards" can catalyze LEED for Neighborhood Development (ND) strategies, such as affordable __housing__, __climate__ protection, and improved public __health__.

5. Developed by the U.S. Green Building Council, __LEED__ is a framework for identifying, implementing, and measuring green building and neighborhood design, construction, operations, and maintenance.

6. List the four main types of building categories the LEED rating systems address:
   1. __commercial__
   2. __institutional__
   3. __residential__
   4. __neighborhood developments__

7. LEED emphasizes __integrative__ design, integration of existing technology, and state-of-the-art strategies to advance expertise in green building and transform professional practice.

8. The LEED ND rating system was launched in May __2009__ after four years of development and pilot testing by a partnership of the USGBC, the Natural Resources Defense Council, and the Congress for the New Urbanism.

9. These ongoing improvements, developed by USGBC member-based volunteer committees, subcommittees, and working groups in conjunction with USGBC staff, have been reviewed by the LEED __Steering Committee__ and the USGBC Board of Directors before being submitted to USGBC __members__ for a vote.

10. What must all building projects do to earn LEED certification?
    Satisfy all __prerequisites__ and earn enough points for the certification __level__ desired.

11. LEED ND applies to __new__ land development projects or __redevelopment__ projects containing residential uses, nonresidential uses, or a mix. Projects can be at any stage of the development process, from conceptual planning to construction; includes __Plan__ and __Built__ Project.

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12. The LEED rating systems aim to promote a transformation of the construction industry through strategies designed to achieve seven goals. List the seven goals:

1. To reverse contribution to global climate change

2. To enhance individual human health and well-being

3. To protect and restore water resources

4. To protect, enhance, and restore biodiversity and ecosystem services

5. To promote sustainable and regenerative material resources cycles

6. To build a greener economy

7. To enhance social equity, environmental justice, community health, and quality of Life.

13. In the LEED ND rating system, the major prerequisites and credits are categorized as:

___Smart Location & Linkage_____ (SLL)

___Neighborhood Pattern & Design_____ (NPD)

___Green Infrastructure & Buildings_____ (GIB)

14. List the name and abbreviation of the bonus categories in the LEED ND rating system:

1. Innovation (IN)

2. Regional Priority (RP)

15. Each ___credit_____ in the rating system is allocated points based on the relative importance of its contribution to the goals.

16. Complete the table for the LEED levels of certification:

Level of Certification	Points
Certified	40-49
Silver	50-59
Gold	60-79
Platinum	80 and above

17. LEED-certified developments are designed to deliver the following benefits:

Lower ___operating___ costs and increased ___asset___ value

Reduced ___waste___ sent to landfills

___Energy___ and ___water___ conservation

More healthful and productive ___environments___ for occupants

Reductions in ___greenhouse___ ___gas___ emissions

Qualification for tax ___rebates___, ___zoning___ allowances, and other incentives in many cities

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18. List what distinguishes the benefits of the LEED ND rating system:
    1. Scale
    2. Comprehensiveness and Synergies
    3. Longevity

19. The process begins when the owner selects the _____rating_____ system and _____registers_____ the project.

20. The project is then designed to meet the requirements for all _____Prerequisites_____ and for the _____credits_____ the team has chosen to pursue.

21. After documentation has been submitted for certification, a project goes through what two reviews?
    1. preliminary
    2. final

22. The _____preliminary_____ review provides technical advice on credits that require additional work for achievement, and the _____final_____ review contains the project's final score and certification level.

23. The decision can be _____appealed_____ if a team believes additional consideration is warranted.

24. The LEED for Neighborhood Development rating system comprises two adaptations:

    LEED ND: _____Plan_____
    LEED ND: _____Built Project_____, which have certification options unique to this rating system.

25. Match the explanation below to the type of review it describes:

Review	Explanation
Smart Location & Linkage (SLL) and Neighborhood Pattern & Design (NPD) prerequisite review.	1
Letter of Support optional review.	2

Explanation

1	This full review of all prerequisites and credits is available to projects registered under LEED ND: Plan that have not earned all land-use entitlements. Applicants seeking an early design-phase award from USGBC to assist with local approvals may elect to undergo this review and will receive a letter of support if successful.
2	If the project team has any doubts about the project's ability to achieve the SLL or NPD prerequisites, this optional review can be a useful official determination before investing further in submission preparation. It is available to both LEED ND: Plan and LEED ND: Built Project registered projects.

26. Match the explanation to the credit structure:

Credit Structure	No.
Intent & Requirements	3
Behind the Intent	6
Step-By-Step Guidance	7
Further Explanation	5
Required Documentation	10
Related Credit Tips	8
Changes from LEED 2009	1
Referenced Standards	4
Exemplary Performance	9
Definitions	2

Explanation

1	is a quick reference of changes from the previous version of LEED.
2	gives the meaning of terms used in the credit.
3	outlines the rating system requirements for achieving the prerequisite or credit. They were approved through the rating system development process and can also be found on the USGBC website.
4	lists the technical standards related to the credit and offers weblinks to find them.
5	provides guidance for lengthy calculations or for special project situations, such as tips for nonstandard project types or different credit approaches. It includes a Campus section and, sometimes, an International Tips section.
6	connects credit achievement with larger sustainability issues and provides information on how the credit requirements meet the intent stated in the rating system.
7	suggests the implementation and documentation steps that can be used by most projects, as well as generally applicable tips and examples.
8	identifies other credits that may affect a project team's decisions and strategies for the credit in question; the relationships between credits may imply synergies or trade-offs.
9	identifies the threshold that must be met to earn an exemplary performance point, if available.
10	lists the items that must be submitted for certification review.

27. List the credit categories and bonus categories and their abbreviations found in the rating system ND.

   1. Smart Location & Linkage (SLL)

   2. Neighborhood Pattern & Design (NPD)

   3. Green Infrastructure & Buildings (GIB)

   4. Innovation (IN)

   5. Regional Priority (RP)

28. An important starting point for project certification is the formulation of overarching goals to guide the project team's work toward successful certification. To set valid goals, start by expressing objectives that are derived from or responsive to the following:

   The developer's ___mission___.

   The project's ___environmental___ setting.

   The project's ___community___ context.

29. For the purposes of LEED ND, the project team has three major components: the _applicant_ acting as team leader, a multidisciplinary group of _design_ professionals, and _local_ supporting partners.

30. What entity decides to certify a project under LEED for Neighborhood Development (LEED ND)?
    A. LEED AP
    B. Owner
    C. Applicant
    D. Contractor

31. Because the rating system integrates smart _growth_, new _urbanism_, social _equity_, and green building practices, a successful LEED ND submission draws on the diverse skills of a comprehensive team of professionals.

32. At least one member of the project team _should_ be a LEED ND Accredited Professional experienced in certifying the kind of project being proposed.

33. List the steps for devising a LEED ND Work Plan:

    Step 1. Identify project site and prepare preliminary Development Program

    Step 2. Select Rating System

    Step 3. Assemble project team and identify relevant organizations

    Step 4. Check minimum program requirements and prerequisites

    Step 5. Finalize Project Boundary and Development Program

    Step 6. Reconfirm minimum Program Requirements and Prerequisite Compliance

    Step 7. Develop LEED Scorecard

    Step 8. Assign Roles and Responsibilities

    Step 9. Develop Consistent Documentation

    Step 10. Perform Quality Assurance Review and Submit for Certification

34. LEED ND: Plan. A project must use the LEED ND Plan rating system if it is in a planning stage or has constructed less than _75%_ of its total building floor area.

35. LEED ND: Built Project. If a project is at _full_ build-out, it must use the LEED ND rating system.

36. The project _boundary_ defines the land and water area that is reviewed for certification (see Minimum Program Requirements).

37. List the types of sites that may apply to a LEED ND project:

    1. previously developed

    2. infill site

    3. Adjacent site

38. **previously developed site** a site that, prior to the project, consisted of at least ___75%___ previously developed land

39. For any lots larger than __1__ acre, the team must separate the land into _previously_ developed and _undeveloped_ portions.

40. **infill site** a site that meets any of the following four conditions:

    a. At least _75%_ of its boundary borders parcels that individually are at least _50%_ previously developed, and that in aggregate are at least _75%_ previously developed.

    b. The site, in combination with bordering parcels, forms an aggregate parcel whose boundary is _75%_ bounded by parcels that individually are at least _50%_ previously developed, and that in aggregate are at least _75%_ previously developed.

    c. At least _75%_ of the land area, exclusive of rights-of-way, within _1/2_ mile of the project boundary is previously developed.

    d. The lands within _1/2_ mile of the project boundary have a preproject connectivity of at least _140_ intersections per square mile.

41. For conditions (a) and (b) above, any fraction of the perimeter that borders a _water_ body is _excluded_ from the calculation.

42. **adjacent site** a site having at least a continuous _25%_ of its boundary bordering parcels that are previously developed sites. Only consider bordering parcels, not intervening rights-of-way. Any fraction of the boundary that borders a _water_ body is _excluded_ from the calculation.

43. **buildable land** the portion of the site where construction can occur, including land _voluntarily_ set aside and _not_ constructed on. When used in density calculations, buildable land _excludes_ public rights-of-way and land excluded from development by codified law or LEED for Neighborhood Development prerequisites.

44. Buildable land is an important element of a project because it is the _denominator_ in the calculation of land-use densities.

45. To be considered nonbuildable, the land must be protected from construction by _easement_, deed _restriction_, or other _enforceable_ legal instrument.

46. The _development program_ is a tabular presentation typically prepared by a developer detailing land uses and the demolition, construction, renovation, or retention of buildings within the project boundary.

47. Several provisions of the rating system are tied to _milestone_ dates on a project's development timeline, beginning with property _acquisition_ and extending _through_ _build-out_ and occupancy.

48. Some rating system provisions must be applied in _perpetuity_.

49. __Property acquisition__ is the date that the project developer purchased or took equivalent control of a majority of the land area inside the project boundary.

__Preproject conditions__ are those present on the date the developer acquired rights to a majority of its buildable land through purchase or option to purchase.

__Existing conditions__ are those present on the date of certification submission. However, a built feature is not considered existing if it was constructed by the project developer as part of the LEED ND project (this will come into play only for projects under construction).

__Build-out__ is the time at which all habitable buildings on the project are complete and ready for occupancy.

50. Because of the numerous geographic provisions and calculations in the rating system, __mapping__ is an important part of documenting project characteristics and verifying credit achievement.

51. List the types of maps project teams should use:
    1. Project site
    2. Vicinity
    3. Special maps

52. Each map should have a __title__ with the applicable credit name, __north point__, __scale__, and the relevant features clearly labeled and dimensioned in sufficient detail to enable verification of credit compliance.

53. The second most common set of metrics in the rating system is the distances traveled by __Pedestrians__ and __bicyclists__ from origins, such as dwellings, to destinations, such as schools.

54. **walk distance** the distance that a __Pedestrian__ must travel between origins and destinations without obstruction, in a __safe__ and comfortable environment on a continuous network of __sidewalks__, all weather-surface footpaths, crosswalks, or equivalent pedestrian facilities. The walking distance must be drawn from an entrance that is accessible to __all__ building users.

55. **bicycle network** a continuous network consisting of any combination of the following:
    (1) off-street bicycle paths or trails at least __8__ feet wide for a two-way path and at least __5__ feet wide for a one-way path
    (2) physically designated on-street bicycle lanes at least __5__ feet wide
    (3) streets designed for a target speed of __25__ mph.

56. Sometimes known as __Shortest__ path analysis, the measurement is the distance a pedestrian or bicyclist would travel from an origin point to the closest destination of a given type, such as the closest bus stop.

57. The term __walkshed__ denotes an area created from a compilation of walk distances from an origin, such as a polygon encompassing all possible pathways within __1/4__-mile walking distance.

58.

59. Dwellings or businesses accessed through common building entries are counted according to the number of dwelling units or business establishments reached through such entrances. For example, a multifamily building entrance used to access 20 dwelling units counts as 20 ___origin___ points. A nonresidential building entrance leading to 10 office tenants and two retail tenants counts as __12__ origin points.

60. The rating system measures land-use density in two categories, residential and nonresidential. Density is calculated according to the following definitions:
    density the amount of building structures constructed on the project site, measured for residential buildings as ___dwelling units___ per acre of buildable land available for residential uses, and for nonresidential buildings as the ___floor-area___ ratio of buildable land area available for nonresidential uses. In both cases, structured ___parking___ is excluded.

    floor-area ratio (FAR) the density of nonresidential land use, exclusive of structured parking, measured as the total ___nonresidential___ building floor area divided by the total ___buildable___ land area available for nonresidential buildings.

61. To be considered a dwelling unit (for the purpose of inclusion in a residential density calculation), the space should be intended for long-term occupancy and provide facilities for ___cooking___, ___sleeping___, and ___sanitation___. ___Hotel rooms___, for example, are not dwelling units.

62. A project's development footprint is essentially all of its ___impervious___ surfaces.

63. **development footprint** the total land area of a project site covered by ___buildings___, ___streets___, ___parking___ areas, and other typically ___impermeable___ surfaces constructed as part of the project.

64. Surfaces paved with ___permeable___ pavement (at least ___50%___ permeable) are excluded from the development footprint.

65. Another common cross-cutting metric is transit service, expressed in ___daily___ trips at ___stops___.

66. Bus, streetcar, or rideshare stops qualify if they are within ___1/4___ mile of at least one project building entrance. Bus rapid transit, light or heavy rail, commuter rail, or ferry stops qualify if they are within ___1/2___ mile of at least one project building entrance.

67. Each point at which a transit vehicle stops to receive or discharge passengers is considered a ___separate___ transit stop; this includes stops ___facing___ each other on ___opposite___ sides of a street.

68. Another rating system metric is connectivity, expressed as ___intersections___ per square mile.

69. Several credits require measuring the distance from a project's ___geographic___ center to certain features, such as farmers markets. In CAD or GIS terms, the project's geographic center is the "___centroid___" of the polygon created by the project boundary.

70. ___circulation network___ all motorized, nonmotorized, and mixed-mode travel ways permanently accessible to the public, not including driveways, parking lots, highway access ramps, and rights-of-way exclusively dedicated to rail. It is measured in linear feet.

71. **block Length** _____ the distance along a block face; specifically, the distance from an intersecting right-of-way edge along a block face, when that face is adjacent to a qualifying circulation network segment, to the next ROW edge intersecting that block face, except for intersecting alley ROWs.

72. List the two categories of users that most credits group users into:
   1. Regular building occupants
   2. Visitors

73. In the space provided write the two equations that can be used to determine a project's total number of FTE:

$$\text{FTE Employees} = \text{Full-time Employees} + \frac{\Sigma \text{ daily part-time Employee hours}}{8}$$

$$\text{FTE employees} = \frac{\Sigma \text{ all employee hours}}{8}$$

74. List the types of regular building occupants used to determine occupancy:
   1. Employees
   2. Staff
   3. Volunteers
   4. Residents
   5. Primary and Secondary students
   6. Hotel guests
   7. Inpatients

75. List examples of what is considered a visitor (transient) for determining building occupancy:
   1. Retail customers
   2. Outpatients
   3. Peak outpatients
   4. Volunteers
   5. High-education students

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76. What are the two ways that occupant types are counted for LEED calculations?
    1. Daily average
    2. Peak totals

77. If occupancy cannot be accurately predicted a project may use what resources to estimate occupancy?
    1. Default occupant density from ASHRAE 62.1-2010, Table 6-1
    2. Default occupant density from CEN Standard EN 15251, Table B.2
    3. Appendix 2 Default Occupancy Counts
    4. Results from applicable studies

78. The __minimum Program Requirements__ (MPRs) are the minimum characteristics that make a project appropriate to pursue LEED certification.

79. List the three MPRs:
    1. must be in a permanent location on existing Land
    2. must use Reasonable LEED Boundaries
    3. must comply with Project size Requirements

80. All LEED projects must be constructed and operated on a __permanent__ location on __existing__ land. No project that is designed to __move__ at any point in its lifetime may pursue LEED certification.

81. The LEED __project boundary__ must include all contiguous land that is associated with the project and supports its typical operations.

82. The gross floor area of the LEED project should be no less than __2%__ of the gross land area within the LEED project boundary.

83. LEED BD+C and LEED O+M Rating Systems
    The LEED project must include a minimum of __1,000__ square feet gross floor area.

84. LEED ID+C Rating Systems
    The LEED project must include a minimum of __250__ square feet gross floor area.

85. LEED for Neighborhood Development Rating Systems
    The LEED project should contain at least __two__ habitable buildings and be no larger than __1500__ acres.

86. LEED for Homes Rating Systems
    The LEED project must be defined as a "__dwelling unit__" by all applicable codes.

87. LEED for Building Design and Construction
    Buildings that are new construction or major renovation. In addition, at least __60%__ of the project's gross floor area must be complete by the time of certification (except for LEED BD+C: __Core and shell__).

88. LEED for Interior Design and Construction.
    Interior spaces that are a complete interior fit-out. In addition, at least __60%__ of the project's gross floor area must be complete by the time of certification.

89. LEED for Building Operations and Maintenance.
Existing buildings that are undergoing ___improvement___ work or little to no construction.

90. LEED for Neighborhood Development
New land development projects or redevelopment projects containing residential uses, nonresidential uses, or a mix. Projects may be at any stage of the development process, from conceptual planning through construction. It is recommended that at least ___50%___ of total building floor area be new construction or major renovation. Buildings within the project and features in the public realm are evaluated.

91. Using the **Rating System Descriptions** below, place the number that best describes the type of building the rating system is appropriate for next to the rating system name:

___5___ LEED BD+C: New Construction and Major Renovation

___9___ LEED BD+C: Core and Shell Development

___6___ LEED BD+C: Schools

___10___ LEED BD+C: Retail

___17___ LEED BD+C: Data Centers

___1___ LEED BD+C: Warehouses and Distribution Centers

___3___ LEED BD+C: Hospitality

___15___ LEED BD+C: Healthcare

___13___ LEED BD+C: Homes and Multifamily Lowrise

___20___ LEED BD+C: Multifamily Midrise

___11___ LEED ID+C: Commercial Interiors

___19___ LEED ID+C: Retail

___2___ LEED ID+C: Hospitality

___12___ LEED O+M: Existing Buildings

___21___ LEED O+M: Retail

___7___ LEED O+M: Schools

___16___ LEED O+M: Hospitality

___14___ LEED O+M: Data Centers

___4___ LEED O+M: Warehouses and Distribution Centers

___8___ LEED ND: Plan

___18___ LEED ND: Built Project

Rating System Descriptions
1. Buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings, such as self-storage.

2. Interior spaces dedicated to hotels, motels, inns, or other businesses within the service industry that provide transitional or short-term lodging with or without food.

3. Buildings dedicated to hotels, motels, inns, or other businesses within the service industry that provide transitional or short-term lodging with or without food.

4. Existing buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings (such as self-storage).

5. New construction or major renovation of buildings that do not primarily serve K-12 educational, retail, data centers, warehouses and distribution centers, hospitality, or healthcare uses. New construction also includes high-rise residential buildings 9 stories or more.

6. Buildings made up of core and ancillary learning spaces on K-12 school grounds. LEED BD+C: Schools may optionally be used for higher education and non-academic buildings on school campuses.

7. Existing buildings made up of core and ancillary learning spaces on K-12 school grounds. May also be used for higher education and non-academic buildings on school campuses.

8. Projects in conceptual planning or master planning phases, or under construction.

9. Buildings that are new construction or major renovation for the exterior shell and core mechanical, electrical, and plumbing units, but not a complete interior fit-out. LEED BD+C: Core and Shell is the appropriate rating system to use if more than 40% of the gross floor area is incomplete at the time of certification.

10. Buildings used to conduct the retail sale of consumer product goods. Includes both direct customer service areas (showroom) and preparation or storage areas that support customer service.

11. Interior spaces dedicated to functions other than retail or hospitality.

12. Existing buildings that do not primarily serve K-12 educational, retail, data centers, warehouses and distribution centers, or hospitality uses.

13. Single-family homes and multi-family residential buildings of 1 to 3 stories. Projects 3 to 5 stories may choose the Homes rating system that corresponds to the ENERGYSTAR program in which they are participating.

14. Existing buildings specifically designed and equipped to meet the needs of high density computing equipment such as server racks, used for data storage and processing. LEED O+M: Data Centers only addresses whole building data centers.

15. Hospitals that operate twenty-four hours a day, seven days a week and provide inpatient medical treatment, including acute and long-term care.

16. Existing buildings dedicated to hotels, motels, inns, or other businesses within the service industry that provide transitional or short-term lodging with or without food.

17. Buildings specifically designed and equipped to meet the needs of high density computing equipment such as server racks, used for data storage and processing. LEED BD+C: Data Centers only addresses whole building data centers (greater than 60%).

18. Completed development projects.

19. Interior spaces used to conduct the retail sale of consumer product goods. Includes both direct customer service areas (showroom) and preparation or storage areas that support customer service.

20. Multi-family residential buildings of 4 to 8 occupiable stories above grade. The building must have 50% or more residential space. Buildings near 8 stories can inquire with USGBC about using Midrise or New Construction, if appropriate.

21. Existing buildings used to conduct the retail sale of consumer product goods. Includes both direct customer service areas (showroom) and preparation or storage areas that support customer service.

92. The _____40 / 60_____ rule provides guidance for making a decision of what rating system to use when several rating systems appear to be appropriate for a project.

93. If a rating system is appropriate for less than _____40%_____ of the gross floor area of a LEED project building or space, then that rating system should not be used.

94. If a rating system is appropriate for more than _____60%_____ of the gross floor area of a LEED project building or space, then that rating system should be used.

95. If an appropriate rating system falls between _____40%_____ and _____60%_____ of the gross floor area, project teams must independently assess their situation and decide which rating system is most applicable.

96. The entire _____gross floor area_____ of a LEED project must be certified under a single rating system and is subject to all _____prerequisites_____ and attempted _____credits_____ in that rating system, regardless of mixed construction or space usage type.

97. Which of these must be satisfied in order to LEED certify a project? [Choose three]
    (A.) MPRs
    B. Project Checklist
    C. All prerequisites and credits for the rating system being used
    (D.) All prerequisites for the rating system being used
    (E.) Enough credits for the rating system being used to achieve the desired level of certification