LEED Building Design and Construction
Activity #2 – Integrative Process (IP)
Before completing this Activity Read: Reference Guide for Building Design and Construction v4 – Pages 36-53

Note the following abbreviations are used in this activity:

NC	LEED BD+C: New Construction and Major Renovation
CS	LEED BD+C: Core and Shell Development
S	LEED BD+C: Schools
R	LEED BD+C: Retail
DC	LEED BD+C: Data Centers
WDC	LEED BD+C: Warehouses and Distribution Centers
HOS	LEED BD+C: Hospitality
HC	LEED BD+C: Healthcare

Although the LEED BD+C reference guide does not number the LEED prerequisites and credits, for this exercise they have been numbered in the order presented in each credit category.

Integrative Process (IP)
Fill-In, Multiple Choice, Matching

1. Test your knowledge of how well you know the names of the prerequisites and credits for the Integrative Process credit category:

P / C	Name	Applies to:
P1	Integrative Project Planning and Design	☐NC ☐CS ☐S ☐R ☐DC ☐WDC ☐HOS ☐HC
C1	Integrative Process	☐NC ☐CS ☐S ☐R ☐DC ☐WDC ☐HOS ☐HC

2. Match the intent to the prerequisite or credit:

Prerequisite/Credit	ANS
IP – P1	B
IP – C1	A

	INTENT
A	To support high-performance, cost-effective project outcomes through an early analysis of the interrelationships among systems.
B	Maximize opportunities for integrated, cost-effective adoption of green design and construction strategies, emphasizing human health as a fundamental evaluative criterion for building design, construction and operational strategies. Utilize innovative approaches and techniques for green design and construction.

3. The Integrative Project Planning and Design prerequisite requires that all Healthcare projects use a cross-discipline design and decision making, beginning in the programming and pre-design phase.

4. List the process that at a minimum the project team must ensure that they follow:
   1. Owner's Project Requirements (OPR) Document
   2. Preliminary Rating Goals
   3. Integrated Project Team
   4. Design Charrette

5. What must be incorporated into the health mission statement?
   Owner's Project Requirements (OPR) Document

6. What must the health mission statement address?
   "Triple bottom line" values - economic, environmental and social.

7. List what the LEED action plan should include, at a minimum:
   1. Determines the LEED certification level to pursue
   2. Selects the LEED credits to meet the targeted certification level
   3. Identifies the responsible parties

8. The integrative project team should include a minimum of four professionals in addition to the owner or owner's representative.

9. As early as practical and preferably before Schematic design, conduct a minimum four hour, integrated design Charrette with the project team.

10. What is the goal of the design charrette?
    To optimize the integration of green strategies across all aspects of building design, construction and operations drawing on the expertise of all participants.

11. List examples of the information that should be collected before the integrative design charrette:
    1. local climate
    2. site conditions
    3. waste treatment infrastructure
    4. energy load distribution
    5. water sources
    6. transportation options
    7. potential building features

12. List the outcomes from the integrative design charrette:
    1. introduce project team to integrative process
    2. Share initial background research and analysis
    3. Elicit the owner's and Stakeholder's values, aspirations, and requirements
    4. Clarify functional and programmatic goals
    5. Establish initial principles, benchmarks, metrics, and performance Targets
    6. Identify desired LEED certification level and credits to be targeted.
    7. Generate potential strategies for achieving performance targets
    8. Determine the questions that must be answered to support project decisions
    9. Initiate development of the projects health mission statement

13. List the documentation that is required for IP Prerequisite Integrative Project Planning and Design:
    1. Narrative explaining how health mission statement addresses credit requirements
    2. Action plan from preliminary rating goals

14. What is the referenced standard for the IP Prerequisite Integrative Project Planning and Design?
    ANSI consensus National Standard Guide 2.0 for Design and Construction of Sustainable Buildings and Communities

15. List the systems that projects must perform an analyses for the IP Credit Integrative Process:
    1. Energy-Related systems
    2. Water-Related Systems

16. Complete the following:

Abbreviation	Name
OPR	Owner's Project Requirements
BOD	Basis of Design

17. List examples of process water demand volumes:
    1. Kitchen
    2. Laundry
    3. Cooling Tower
    4. other equipment

18. List examples of nonpotable water supply volumes:
    1. on-site rainwater
    2. on-site graywater
    3. municipally supplied nonpotable water
    4. HVAC equipment Condensate

19. In an integrative process the team members collaboration to enhance the efficiency and effectiveness of every system.

20. List the three phases of an integrative process:
    1. Discovery
    2. Design and Construction
    3. Occupancy, operations, and performance feedback

21. Feedback is critical to determining success in achieving performance targets, informing building operations, and taking corrective action when targets are missed.

22. What EPA tool can projects use to benchmark energy performance for the project's type, scope, occupancy, and location?
    Target Finder Tool

23. List the main areas projects can assess for expected water demand:
    1. Indoor water demand
    2. Outdoor water demand
    3. Process water demand

24. List aspects that should be included when conducting a preliminary energy model:
    1. site conditions
    2. massing and orientation
    3. Basic envelope attributes
    4. lighting levels
    5. Thermal comfort ranges
    6. Plug and process load needs
    7. Programmatic and operational parameters

25. List the end uses projects should include when performing a "simple box" energy model to identify initial annual energy consumption percentages of total energy use:
    1. space heating
    2. space cooling
    3. ventilation
    4. Domestic Hot water
    5. Lighting
    6. Miscellaneous equipment
    7. Other, as applicable

26. List the information that is included in the Basis of Design (BOD):
    1. system descriptions
    2. indoor environmental quality criteria
    3. Design assumptions
    4. codes, standards, regulations, and guidelines

27. List what the Owner's Project Requirements (OPR) details:
    1. Ideas
    2. concepts
    3. criteria determined by the owner to be important

28. List design aspects that the project team could consider for analyzing building envelope performance:
    1. Solar heat Gain coefficients, U-value of glazing systems
    2. R-value (insulation)
    3. Building orientation effect on energy loads
    4. Effect of percentage of exterior glazing

29. Before design of the building form begins, a building massing ("simple box") energy analysis can be used to evaluate potential energy and load reduction strategies, such as insulation levels and window performance levels.

30. Small commercial and most residential projects energy use is likely to be dominated by which of these?
    A. External loads
    B. HVAC Equipment
    C. Domestic Hot Water Systems
    D. Computers
    E. Internal Loads

31. List examples of programmatic and operational parameters:
    1. Building size
    2. hours of occupancy
    3. number of occupants

32. List examples of what the typical energy consumption by end use for a project depends on:
    1. Building type
    2. occupancy
    3. climate
    4. other project-specific conditions

33. What systems are the two largest energy end uses for a hospital?
    1. space heating and cooling
    2. MISC Equipment loads

34. List the internal heating and cooling loads that large commercial buildings tend to be dominated by, depending on climatic conditions:
    1. occupants
    2. equipment
    3. ventilation

35. List the benefits that reducing the number of lighting fixtures in a building could have on the energy consumption of the building:
    1. cost for electrical energy for lighting in reduced
    2. cost for cooling may decrease due to reduction in heat produced by the electric lights.