(C) Community Evaluation Checklist Example

Directions: In the Criteria Column, fill in the criteria, one per line. In the Draft #1 Column, place a ✓ in the box if your design meets each criterion, leave it blank if your design does not meet the criterion. Do the same for Draft #2.

Criteria	Draft #1	Draft #2
A way for people in your community to get oxygen	✓	✓
Protection from radiation	✓	
Plan to get and use water	✓	✓
Food sources		✓
Protection from dust	✓	✓
Heat source		
Energy source		✓
Housing	✓	✓
Movie Center		✓
Culinary arts area	✓	

(D) Teacher Resource. Imagine Rubric (1 of 2)

You will know the level to which your students have achieved the **Learning Outcomes**, and thus the **Instructional Objective(s)**, by using the suggested **Rubrics** below.

Instructional Objective 1: To evaluate proposed solutions in a design task

Related Standard(s) (will be replaced when new NRC Framework-based science standards are released):

National Science Education Standards (NSES)
(E) Science and Technology: Abilities of Technological Design
Design a solution or a product. Students should make and compare different proposals in the light of the criteria they have selected. They must consider constraints such as cost, time, trade-offs, and materials needed and communicate ideas with drawings and simple models. (Grades 5-8: E1b)

Related Rubrics for the Assessment of Learning Outcomes Associated with the Above Standard(s):

Learning Outcome	Expert	Proficient	Intermediate	Beginner
LO1a: Identify environmental constraints and cultural and other requirements	List includes maximum and thoughtful items.	List includes many items.	List includes some items.	List includes a few items.
LO1b: Develop acceptable measures	Sticky notes reflect a maximum of thoughtful, appropriate solutions to community requirements	Sticky notes reflect a many thoughtful, appropriate solutions to community requirements	Sticky notes reflect some appropriate solutions to community requirements	Sticky notes reflect few appropriate solutions to community requirements
LO1c: Compare and choose proposed solutions	Solution choices are thoughtful, reasonable and address community requirements.	Solution choices are reasonable and address community requirements.	Solution choices are mostly reasonable and address community requirements.	Solution choices are not reasonable or do not address community requirements.

(D) Teacher Resource. Imagine Rubric (2 of 2)

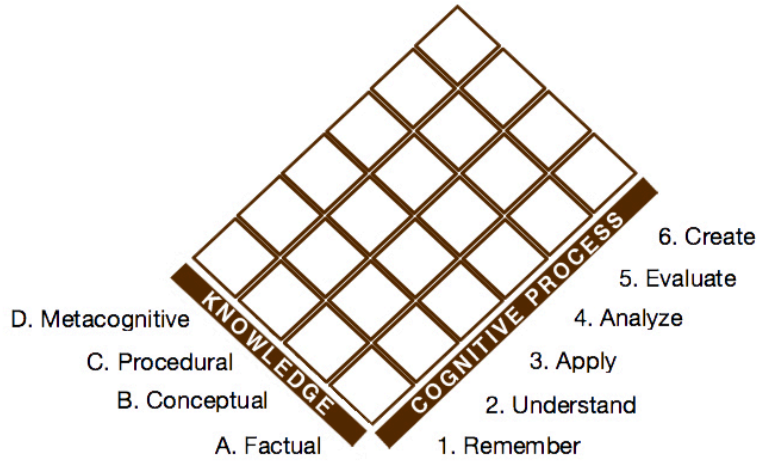
Related Standard(s) (will be replaced when new NRC Framework-based science standards are released):

National Science Education Standards (NSES)
(E) Science and Technology: Abilities of Technological Design
Evaluate completed technological designs or products. Students should use criteria relevant to the original purpose or need, consider a variety of factors that might affect acceptability and suitability for intended users or beneficiaries, and develop measures of quality with respect to such criteria and factors; they should also suggest improvements and, for their own products, try proposed modifications. (Grades 5-8: E1d)

Related Rubrics for the Assessment of Learning Outcomes Associated with the Above Standard(s):

Learning Outcome	Expert	Proficient	Intermediate	Beginner
LO1d: Judge community designs using criteria (checklist)	Checklist accurately and honestly evaluates both communities.	Checklist accurately evaluates both communities.	Checklist evaluates both communities with few mistakes.	Checklist evaluates both communities with numerous mistakes.
LO1e. Modify community designs using criteria	Modifications are innovative and fully match criteria.	Modifications are innovative and mostly match criteria.	Modifications somewhat match criteria.	Modifications do not match criteria.

(E) Teacher Resource. Placement of Instructional Objective and Learning Outcomes in Taxonomy (1 of 3)

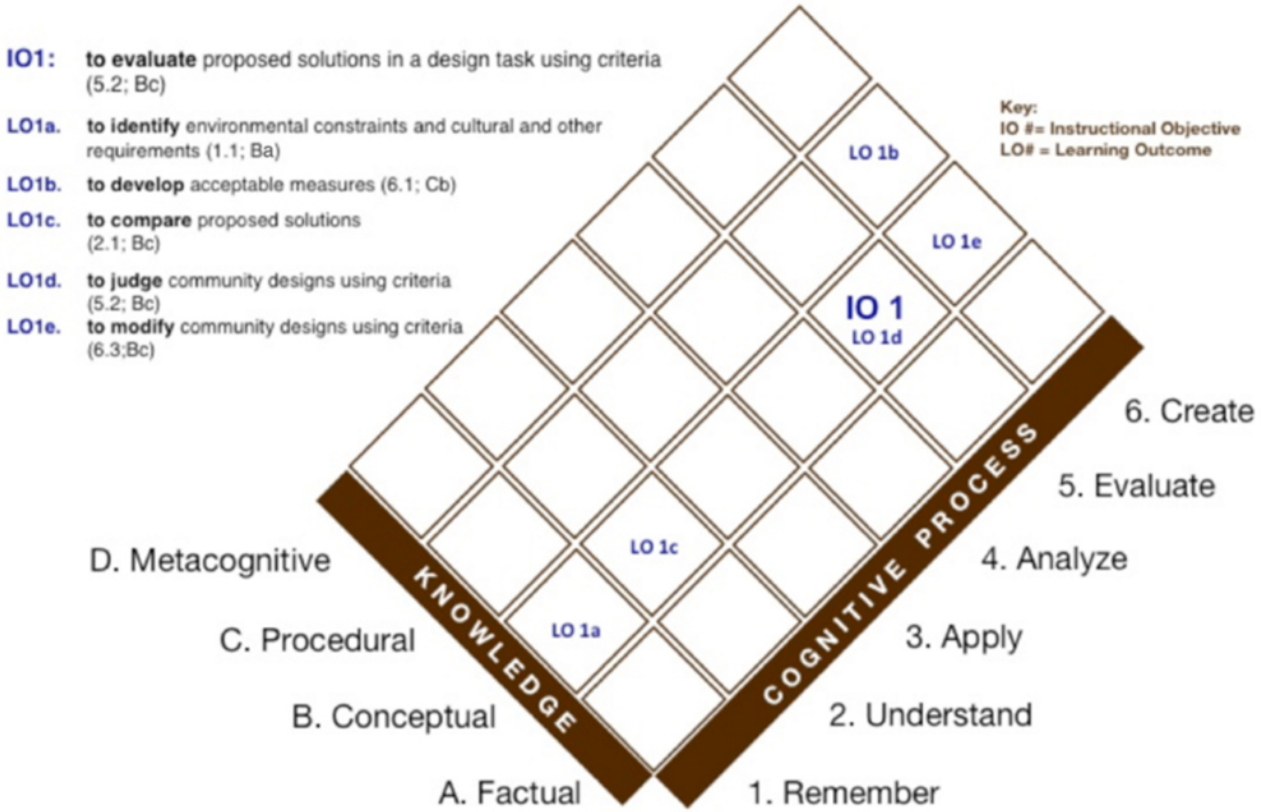


This lesson adapts Anderson and Krathwohl's (2001) taxonomy, which has two domains: Knowledge and Cognitive Process, each with types and subtypes (listed below). Verbs for objectives and outcomes in this lesson align with the suggested knowledge and cognitive process area and are mapped on the next page(s). Activity procedures and assessments are designed to support the target knowledge/cognitive process.

Knowledge	Cognitive Process
A. Factual **Aa:** Knowledge of Terminology **Ab:** Knowledge of Specific Details & Elements **B. Conceptual** **Ba:** Knowledge of classifications and categories **Bb:** Knowledge of principles and generalizations **Bc:** Knowledge of theories, models, and structures **C. Procedural** **Ca:** Knowledge of subject-specific skills and algorithms **Cb:** Knowledge of subject-specific techniques and methods **Cc:** Knowledge of criteria for determining when to use appropriate procedures **D. Metacognitive** **Da:** Strategic Knowledge **Db:** Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge **Dc:** Self-knowledge	**1. Remember** **1.1** Recognizing (Identifying) **1.2** Recalling (Retrieving) **2. Understand** **2.1** Interpreting (Clarifying, Paraphrasing, Representing, Translating) **2.2** Exemplifying (Illustrating, Instantiating) **2.3** Classifying (Categorizing, Subsuming) **2.4** Summarizing (Abstracting, Generalizing) **2.5** Inferring (Concluding, Extrapolating, Interpolating, Predicting) **2.6** Comparing (Contrasting, Mapping, Matching **2.7** Explaining (Constructing models) **3. Apply** **3.1** Executing (Carrying out) **3.2** Implementing (Using) **4. Analyze** **4.1** Differentiating (Discriminating, distinguishing, focusing, selecting) **4.2** Organizing (Finding coherence, integrating, outlining, parsing, structuring) **4.3** Attributing (Deconstructing) **5. Evaluate** **5.1** Checking (Coordinating, Detecting, Monitoring, Testing) **5.2** Critiquing (Judging) **6. Create** **6.1** Generating (Hypothesizing) **6.2** Planning (Designing) **6.3** Producing (Constructing)

(E) Teacher Resource. Placement of Instructional Objective and Learning Outcomes in Taxonomy (2 of 3)

The design of this activity leverages Anderson & Krathwohl's (2001) taxonomy as a framework. Pedagogically, it is important to ensure that objectives and outcomes are written to match the knowledge and cognitive process students are intended to acquire.



(E) Teacher Resource. Placement of Instructional Objective and Learning Outcomes in Taxonomy (3 of 3)

The design of this activity leverages Anderson & Krathwohl's (2001) taxonomy as a framework. Below are the knowledge and cognitive process types students are intended to acquire per the instructional objective(s) and learning outcomes written for this lesson. The specific, scaffolded 5E steps in this lesson (see 5.0 Procedures) and the formative assessments (worksheets in the Student Guide and rubrics in the Teacher Guide) are written to support those objective(s) and learning outcomes. Refer to (E, 1 of 3) for the full list of categories in the taxonomy from which the following were selected. The prior page (E, 2 of 3) provides a visual description of the placement of learning outcomes that enable the overall instructional objective(s) to be met.

At the end of the lesson, students will be able

IO1: to evaluate solutions

5.2: to evaluate

Bc: knowledge of theories, models, and structures

To meet that instructional objective, students will demonstrate the abilities:

LO1a: to identify constraints/requirements

1.1: to identify

Ba: knowledge of classifications and categories

LO1b: to develop measures

6.1: to develop

Cb: knowledge of subject specific techniques and methods

LO1c: to compare solutions

2.1: to compare

Bc: knowledge of theories, models, and structures

LO1d: to judge designs with criteria

5.2: to judge

Bc: knowledge of theories, models, and structures

LO1e: to modify using criteria

6.3: to modify

Bc: strategic knowledge