

# TeachEngineering Engineering Categories

We categorize *TeachEngineering* curricula by their amount or depth of engineering as a way to help users understand what is available to them in the digital library. These **engineering categories** are not meant to be rankings of the quality or value of curricula in any other sense. Anecdotally, categories 1 and 2 are primarily science/math with some engineering, category 3 is primarily engineering with some science/math, and category 4 presents full engineering design. See below for more complete descriptions of each category.

When submitting curriculum for publication on *TeachEngineering*, authors should consider these categories carefully. Meeting the criteria for one of the four categories is required for all activities and optional for lessons and units. In most cases, lessons and units will either not have a category or have the same category as the most relevant lessons and activities below them. In rare instances, activities will work as a whole, in terms of their level of engineering design content, so that the lesson or unit will actually have a different category than the activities below it. For example, a unit might be category 4 because its lessons and activities contain all of the steps in the engineering design process even though none of those individual lessons and activities is categorized as providing the complete engineering design process. Only curricula that fall within categories 3 and 4 are eligible for the *Premier Award for K-12 Engineering Curriculum*.

**Definition of Engineering:** *The creative application of scientific (including math) principles to design, develop and/or predict behavior of structures, machines, apparatus or processes for an intended function (societal problem), with consideration of economics, ethics and safety to life and property. (modified from ABET)*

**Definition of Technology:** *Technology is product created by engineers.*

## Category 1. Relating Science Concept to Engineering

The curriculum is designed to teach a science concept in part through *relating* the concept to an engineering situation. Here, the primary curricular objective is to teach the science concept and the secondary objective is to teach the concept through its *relationship* to engineering. *Relating* the concept might require students to identify real-world problems for which the concept might be useful, identify a type of engineer and how they might use the concept, or apply the concept to a problem or an intended function. The engineering relationship must be addressed in the Procedure and/or Assessment sections.

Activities/lessons/units must meet the following to qualify for this category (*see attached rubric*):

- Section A: Answer “yes” to **two** of two criteria

## Category 2. Relating Math Concept to Engineering

The curriculum is designed to teach a math concept in part through *relating* the concept to an engineering situation. Here, the primary curricular objective is to teach the math concept and the secondary objective is to teach the concept through its *relationship* to engineering. *Relating* the concept might require students to identify real-world problems for which the concept might be useful, identify a type of engineer and how they might use the concept, or apply the concept to a problem or intended function. The engineering relationship must be addressed in the Procedure and/or Assessment sections.

Activities/lessons/units must meet the following to qualify for this category (*see attached rubric*):

- Section A: Answer “yes” to **two** of two criteria

### Category 3. Engineering Analysis or Partial Design

Curriculum at this level may include: 1) a portion of the engineering design process; 2) analysis or testing to predict behavior of structures, machines or processes; or 3) comprehensive application of a scientific (or math) concept to a real problem. Category 3 curriculum is primarily engineering with some science.

Activities/lessons/units must meet the following to qualify for this category (*see attached rubric*):

- Section A: Answer “yes” to **two** of two criteria
- Section B: Answer “yes” to **two** of four criteria
- Section C: Answer “yes” to **one** of six criteria

### Category 4. Complete Engineering Design Process

These curricula require students to complete the entire engineering design process in a systematic manner. See <http://teachengineering.org/engrdesignprocess.php> for a complete description of the engineering design process.

Activities/lessons/units must meet the following to qualify for this category (*see attached rubric*):

- Section A: Answer “yes” to **two** of two criteria
- Section B: Answer “yes” to **two** of four criteria
- Section C: Answer “yes” to **four** of six criteria

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