

Activity Template

A published activity on TeachEngineering might look like this example →

Notice the “information box” on the first page (→); it provides teachers with key information to quickly review the activity to see if it meets their needs, before they look at the rest of the activity write-up.

From this point on, this template describes the **required** and optional components for all activities published in the TE digital library collection.

Visit <http://TeachEngineering.org> to see examples of activity content and how they render on the website.

Subject Area(s) [Choose from: algebra , biology, chemistry, data analysis & probability, earth & space, geometry, life science, measurement, number & operations, physical science, problem solving, reasoning & proof, science & technology]

Associated Unit _____

[To what unit does this belong? Leave blank if does not apply.]

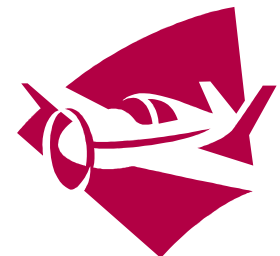
Associated Lesson _____

[To what lesson does this activity belong? Leave blank if it is a standalone activity.]

Activity Title _____ [Provide a catchy activity title]

Header Example: Insert Image 1 here, right justified to wrap
[(optional) Insert images or other text that you want to appear at the beginning of the document, near the document’s information box.]

Image 1 ADA Description: Graphic of a propeller plane. Caption: none Image file name: cub_airplanes_lesson03_activity2_image1.jpg Source/Rights: Copyright © 2004 Microsoft Corporation, One Microsoft Way, Redmond, WA 98052-6399 USA. All rights reserved.



The screenshot shows the TeachEngineering website interface. At the top, it says 'TEACH Engineering Resources for K-12'. Below that, there are navigation links like 'Home', 'Curriculum', 'Activities', and 'Mini-Landslide'. The main content area is titled 'TE Activity: Mini-Landslide'. It includes a table with details: Grade Level: 3 (3-5), Group Size: 8, Time Required: 50 minutes, Activity Dependency: None, and Expendable Cost Per Group: US\$2. There is a 'Keywords' section, a 'Summary' section, an 'Engineering Connection' section, and a 'Reviews' section. On the right side of the activity page, there is a photograph of a 100-meter long debris chute used for simulating landslides. A red 'example' watermark is overlaid on the right side of the screenshot.

Grade Level __ (__ - __)

[What grade(s) is (are) targeted in this activity? “It is targeted for grade __, but could work for grades __ to __.” Example: 8 (7-9) or 8 (8-8) for just eighth grade, or 8 (5-9) if it also works for lower-grade students.]

Activity Dependency

[(optional) Does this activity depend on another *TeachEngineering* lesson or activity? If so, list the title(s) in the order you would like them to appear on the website.]

Time Required ___ minutes, hours, days or weeks *Example:* 50 minutes

[To help in teacher planning, provide an estimate of time to complete the activity. Cannot be a time range, however you may include an optional text note for a brief explanation. We often find that lessons take 15-20 minutes, and associated activities take longer, often totaling one class period, ~50 minutes.]

Group Size ___

[(optional) Are students working alone, in pairs, groups of three, etc.? This must be one number, not a range. If working alone, group size is 1. If a class activity, group size is 28. Unable to include a text note with this component, so if an explanation of group size is required (“This is a demonstration for the entire class”) or you want to suggest a range (“Divide the class into teams of four or five students each.”), put it in the Procedure section.

Expendable Cost per Group US\$ ___ *Example:* US\$.50

[(optional) What material costs are associated with this activity that cannot be re-used in another activity? (For example, do not include the cost of a microscope, scissors, paper or other items available in a typical classroom.) We strive to meet the “engineering on a shoestring” approach of no more than \$20 per activity (= group size x cost per group). Must be an amount in U.S. dollars, not a range, however you may include an optional text note for a brief explanation.]

Summary

[Provide a brief paragraph summarizing the activity and topics students learn about. Must be one paragraph of plain text, which means no images or formatting. Write in present tense, not future.]

Engineering Connection

[Provide 60-100 words or ~3 sentences clarifying how the scientific and mathematical concepts being studied in this activity pertain to real-world engineering. Do not recap the activity. It often works to associate activity concepts to particular fields of engineering. For example, if the activity is about tension and compression, you might say that mechanical engineers use these principles when they design structures such as bridges and roller coasters. Must be one paragraph of plain text, which means no images or formatting.]

Keywords

Example: compression, force, marshmallow, mechanics, tension, pasta, sky scraper, structure

[Provide 4-10 keywords. They should be words the layperson and a K-12 teacher would know and **might use to search** for the activity. List in A → Z order, lower-case unless proper nouns. Avoid highly technical or lingo words. It is likely you have used these words in the summary. For example, keywords might be concepts (tension, photosynthesis) or materials (marshmallows, batteries). Usually, make nouns singular. Even though TE provides a full text search capability, often these become the few keywords that are seen by other websites that search the TeachEngineering collection.]

Educational Standards

[List all the educational state standards addressed in the activity, including science, math, engineering and technology (we hope to include reading and writing, and history in the future).

These should be **specific standards, not just the broader objectives of the standards**. Bullet format suggested. *Examples:*]

- Science: 1.x, etc.
- Math: 1.x, etc.

[Special note for Massachusetts: The standards for Middle School Science are written in the same format except that instead of a “strand” there is a number: 1 for Earth and Space Science, 2 for Life Science and 3 for the Physical Science strand. For example, 1.12 stands for the “Relate the extinction of species to a mismatch of adaptation and the environment” standard in the earth and space science strand.]

Pre-Requisite Knowledge

[(optional)What does the student need to know to be successful in this activity (a previous lesson, a certain topic, specific math skills)? *Examples:* A familiarity with north, south, east, west compass directions. A basic understanding of gravity and friction. Ability to calculate averages.]

Learning Objectives

After this activity, students should be able to:

- Describe, list, relate, define...

[In statement form, identify **2-4 main** intended goal(s) or student outcome(s) of the activity in science, math and any other standards covered. Learning objectives often come from the educational standards you identified.]

Materials List

[A list of materials that each group needs for this activity (including where to find or purchase unusual items). Please provide measurements in **metric units**, as **required** by our NSF-funded TE grant; it is okay to provide both metric and English units, for *example*, string, 2 m (6 ft).]

Each group needs: (suggested subheading)

- xxx

To share with the entire class: (suggested subheading)

- xxx

Introduction / Motivation

[Write this section as if you were directly talking to the students. Suggest how the teacher might prepare the students for the activity. Provide an engineering context. How do you grab the students’ interest? This could be a demo, an example or real-world context. Ask questions of the students to engage them. Create a storyline that flows with the objectives to make the activity more challenging and exciting. Suggested half-page minimum. Address the learning objectives identified earlier. Include teacher instructions and answers in parentheses, such as: (write on the classroom board) or (possible answers: xxx, yyy, zzz).]

Vocabulary / Definitions

[(optional) Define unusual or probably unknown words, including unclear keywords, for the target grade level, plus any engineering words that are used in the activity. Capitalize only the first word of a multiple-word term, unless it is a proper noun. Write definitions in sentence format, even phrases (begin with capital letter; end with a period).]

Word	Definition

Procedure

[Clearly explain the step-by-step procedure to follow to conduct the hands-on activity. **Make sure to include connections to engineering and address activity objectives.** To clarify the activity set-up and procedure, place **images**, photographs and diagrams throughout this section and the activity write-up. Use figure numbers if the image is referenced in the text and has a caption. Remember to use metric units.]

Background [(suggested subheading, if needed) Clearly explain any essential background information the teacher may need to know to successfully complete this activity. Usually in paragraph format.]

Before the Activity (suggested subheading)

- *Example:* Gather materials and make copies of the worksheet.
- Describe any other pre-activity preparation here...
- Bullet format suggested.

With the Students (suggested subheading)

1. *Example:* Divide the class into groups of two or three students each.
2. Describe step-by-step procedures here...
3. Numbered list format suggested.

Image Insert Image # or Figure # here, [note position: left justified, centered or right justified]

Figure 1

ADA Description: Photo shows a two liter bottle with two straws sticking through the cap with balloons held on the straw ends with rubber bands. The bottle bottom is cut off and replaced with another balloon stretched over the bottle opening

Caption: Figure 1: Example lung/diaphragm model made by students.

Image file name: cub_biotech_lesson04_activity1_figure1.jpg

Source/Rights: Copyright © Teresa Ellis, ITL Program, University of Colorado at Boulder, 2005.



Attachments

[(optional) List activity attachments, such as handouts, worksheets, worksheet answers, quizzes, data sheets, readings, graphics, visual aids, etc., in digital format (see Introductory Notes for details). In addition to PDF versions, provide original format versions (Word, Excel, PowerPoint) so teachers can modify. In listing the attachment names, include the file format (see example, below), to help teachers choose what to download/print. When naming files for attachments, use lower-case letters only – no caps! This includes file extensions: jpg, .doc, pdf, ppt, etc. Also, leave no spaces in the file names. Use underscores instead. On TE, attachments listed will be hot-linked directly to the file.]

Examples:

[Pair of Chutes Worksheet \(pdf\)](#)

[Pair of Chutes Worksheet \(doc\)](#)

[Pair of Chutes Worksheet Answers \(pdf\)](#)

[Pair of Chutes Worksheet Answers \(doc\)](#)

Safety Issues

[(optional) What safety measures must be considered for this activity? *Example:*]

- Use eye protection (goggles or safety glasses) during this activity.
- Bullet format suggested.

Troubleshooting Tips

[(optional) Think through likely common snags that might be encountered while conducting the activity. Suggest solutions, approaches to avoid pitfalls, etc. What should you consider if the activity does not work right the first time? What could you change? Providing hints to students at the appropriate time in the procedures?]

Investigating Questions

[(optional) Provide questions for the teacher to pose to students that require them to figure out the meaning of something. Students may come to somewhat different conclusions. The questions could serve as a brainstorming session or a quick wrap-up to the activity.]

Assessment

[Provide assessment tools/activities for teachers to assess the learning objectives described earlier. How do you know if the students “got it” during the activity and after the activity? Provide active and embedded ways for the teacher to gauge what the students know about the topic at the beginning, and whether the students met the learning objectives at the end. For examples of assessment tools, feel free to browse the TeachEngineering collection.]

Pre-Activity Assessment (suggested subheading)

Descriptive Title: Describe the assessment procedure so the teacher knows what to do...

Activity Embedded Assessment (suggested subheading)

Descriptive Title: Describe the assessment procedure so the teacher knows what to do...

Post-Activity Assessment (suggested subheading)

Descriptive Title: Describe the assessment procedure so the teacher knows what to do...

Activity Extensions

[(optional) Provide suggestions of additional activities that explore the activity topic further, and suggestions for thought-provoking questions for the students in the weeks ahead.]

Activity Scaling

[(optional) Explain modifications or suggestions to activities that would make them more or less challenging for use at various grade levels, or within one grade for class groups who are more advanced or behind. For example: reducing or increasing the number of redesign steps, shorter time period to complete the activity, graphing the collected data, etc. *Example lead-ins:*]

- For lower grades,
- For younger students,
- For upper grades,
- For older students,
- For more advanced students,

Additional Multimedia Support

[(optional) Provide ideas and sources for additional information to support the activity, such as online animations, video/DVDs or attached PowerPoint slide presentations, etc.]

References

[(optional) List all references used to create the activity. Also include suggested good resources. Use MLA format (see below). Provide in A → Z order according to authors' last names or website banner page name, whichever appears first in citation.]

For books:

Lastname, Firstname. Book Title. City, ST: Publisher Name, year.

For websites:

Author(s) [Lastname, Firstname]. BannerPageName. LastUpdated/Posted/RevisedDate.
OwnerName, Organization. Accessed September 14, 2007. <http://www.colorado.edu>

Examples:

Dictionary.com. Lexico Publishing Group, LLC. Accessed September 14, 2007. (Source of some vocabulary definitions, with some adaptation) <http://www.dictionary.com>

Rocks, USGS Geology in the Parks. Updated January 13, 2004. U.S. Geological Survey, U.S. Department of the Interior. Accessed September 14, 2007.
<http://geology.wr.usgs.gov/docs/usgsnps/rxmin/rock.html>

For magazine articles:

Doe, Jane Q. "Title of an Article." Title of a Magazine. 12 August 1999: 23.

For journal articles:

Doe, John R. "Title of an Article." Title of a Scholarly Journal. 18 (1987): 112-28.

Other

[(optional) This component is available for information that doesn't seem to fit in anywhere else.]

Redirect URL

[(optional) If the activity is also available at a non-TE/originator website, such as the Adventure Engineering curricula, list the alternate URL at which users may find this curricular write-up, often presented in a non-TE/originator format.]

Owner

[Briefly provide the name and organization of the source/owner of this curricular content.]

Example: Integrated Teaching and Learning Program, College of Engineering, University of Colorado at Boulder

Contributors

[(optional) List the name(s) of who contributed to developing, testing, reviewing and editing this activity. We usually list the primary creator first. Role and organization may be included, too.]

Example: Jay Shah, Malinda Schaefer Zarske, Janet Yowell

Copyright

[(optional) To include a brief copyright citation for the source/owner of this curricular content, provide a copyright year and owner name. Further description may be included, as well.]

Example: Copyright © 2007 by Regents of the University of Colorado. This digital library content was developed by the Integrated Teaching and Learning Program under National Science Foundation Grant No. 0338326.

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