

Sample Format/Template for Creating Technology & Engineering Education Contextual Learning Units/Design Briefs/TLA's

This outline is provided to assist in planning an effective problem-solving activity related to the normal curriculum content found in most schools. It is intended as a guide to prompt consideration of the components that make technology and engineering education a unique experience for all learners, K-12. We will use the “backward design process” explained in *Understanding by Design* (Wiggins and McTighe, 1998). They identify three stages:

1. Identify desired results.
2. Determine acceptable evidence.
3. Plan learning experiences and instruction.

Stage 1: Identify Desired Results

What should students understand and be able to do long after the course, unit or activity is completed? National, state and local standards help guide the process of identifying what students should know, understand, and be able to do. Identify the appropriate standards which guide the activity. Selecting content involves working from general goals for programs and courses to specific objectives for lessons and activities. Every discipline has both a body of content and a way of adding to that knowledge base. The Technology for All Americans Project identifies dimensions (themes) of technology that can help guide curriculum planning:

1. Design
2. Develop and Produce Products and Systems
3. Use and Manage Technology
4. Assess the Impacts and Consequences of Technology
5. Nature and History of Technology
6. Connections

Stage 2: Determine Acceptable Evidence

Once the student knowledge and ability are in focus, and before activities are planned, it is essential that a decision be made regarding how everyone will know when the goal has been reached. Describe exactly what constitutes acceptable criteria. What criteria will be used to assess the activity and to evaluate student performance. Student self-evaluation, as well as, peer-evaluation, are an appropriate part of this process, and consideration should be given to questions to be answered as a result of experiences gained through participation in the lesson/activity. A broad range of assessment techniques should be used to collect evidence that students have the knowledge and ability identified through the desired results section.

Stage 3: Plan Learning Experiences and Instruction

Supporting Lesson Plans: Each unit will require one or more supporting lesson plans. List them here.

- **Theme/Topic/Connections:** Describe how the activity follows or builds on previous learning and how the experience will be used in further learning situations. Include connections with existing curriculum content and interdisciplinary approaches. Explain the connection of the activity to other classroom learning; readings, discussions, and school/real-life experiences.
- **Context/Situation:** Describe the setting for the activity and its relationship to the sequence of the instructional program. The context should include and state the human want, need or desire to be resolved with successful completion of the activity. Where possible, relate the activity to pertinent current events, news items and contemporary issues.
- **Challenge:** Establish the parameters for the problem-solving activity; what is to be accomplished or, more specifically, what problem must be solved.
- **Criteria/Parameters:** Explain the process to be followed in completing the problem-solving activity. Reference to the technological method and problem-solving process/cycle below.
- **Resources:** Describe the materials to be used in the problem-solving process. Materials may be as encompassing or limited as the teacher decides, which will have an impact on solutions. This provides an opportunity to review with students the resources of technology and the constraints (tools/machines, materials, information, people, capital, energy & time). This sets the stage for learning about economics and related educational experiences. Materials include reference items, supplies, tools, and protective devices (aprons, safety glasses, etc.) where appropriate, etc.

*** The Technological Method/Process (The Human Created & Controlled World)**

