Introduction to the performance standards for
Applied Learning

Applied Learning focuses on the capabilities people need to be productive members of society, as individuals who apply the knowledge gained in school and elsewhere to analyze problems and propose solutions, to communicate effectively and coordinate action with others, and to use the tools of the information age workplace. It connects the work students do in school with the demands of the twenty-first century workplace.

As a newer focus of study, Applied Learning does not have a distinct professional constituency producing content standards on which performance standards can be built. However, the Secretary’s Commission on Achieving Necessary Skills (SCANS) laid a foundation for the field in its report, Learning a Living: A Blueprint for High Performance (1992) which defined the concept of “Workplace Know-how.” We worked from this foundation and from comparable international work to produce our own “Framework for Applied Learning” (New Standards, 1994). That framework delineated nine areas of competence and spelled out their elements. The nine areas of competence were as follows:

- Collecting, analyzing, and organizing information;
- Communicating ideas and information;
- Planning and organizing resources;
- Working with others and in teams;
- Solving problems;
- Using mathematical ideas and techniques;
- Using technology;
- Teaching and learning on demand;
- Understanding and designing systems.

The Applied Learning performance standards have been built upon this framework. The standards have also been built on the experience of the Fort Worth Independent School District’s applied learning initiative and the application projects developed by Mountlake Terrace High School in Washington.

We adopted the approach of developing distinct standards for Applied Learning rather than weaving them through the standards for the core subject areas. The advantage of establishing distinct standards for Applied Learning is that it focuses attention on the requirements of these standards and asserts an explicit role for Applied Learning as a domain for assessment and reporting of student achievement. “Cross-curricular” standards run the risk of being absorbed and lost within the expectations of the different subjects. However, the disadvantage of this approach is that it may be interpreted as advocating the development of Applied Learning as a subject in its own right to be studied in isolation from subject content. That is not the intention of these standards. We do not advocate development of Applied Learning as a separate subject. We expect that the work students do to meet the Applied Learning performance standards will take place generally within the context of a subject or will draw on content from more than one subject area. This expectation is stated in the performance description for A1, Problem Solving.

There are five performance standards for Applied Learning:

A1 Problem Solving;
A2 Communication Tools and Techniques;
A3 Information Tools and Techniques;
A4 Learning and Self-management Tools and Techniques;
A5 Tools and Techniques for Working With Others.

A1, Problem Solving is the centerpiece of the standards. The performance description defines problem solving projects focused on productive activity and organized around three kinds of problem solving:

- Design a product, service or system in which the student identifies needs that could be met by new products, services, or systems and creates solutions for meeting them;
- Improve a System in which the student develops an understanding of the way systems of people, machines, and processes work; troubleshoots problems in their operation and devises strategies for improving their effectiveness;
- Plan and organize an event or an activity in which the student takes responsibility for all aspects of planning and organizing an event or an activity from concept to completion.

The performance description specifies the criteria for each kind of problem solving project. These criteria become progressively more demanding from elementary school to high school.

The four “tools and techniques” standards are designed to work in concert with the Problem Solving standard. Each of these standards describes tools and techniques that are needed for success in completing projects of the kinds outlined above.

The tools and techniques described in A2 - A5 (such as gathering information, making a multi-media presentation, learning from models, and working as a member of a self-directed team) are only meaningful when considered in the context of work that has a genuine purpose and audience. The key to effective use of these tools and techniques is the capacity to put them to use in an integrated way in the course of completing a real task. It is critical, therefore, that they be learned and used in such contexts rather than practiced in a piecemeal way as skills for their own
sake. Students are expected to demonstrate their achievement of the tools and techniques standards in the context of problem solving projects. This is reflected in the examples listed under the performance descriptions. At the same time, it is unlikely that any one project will allow students to demonstrate their achievement in relation to all of the standards. This is evident from the work samples and commentaries. In fact, it is likely that a project that attempts to cover all of the parts of the standards will accomplish none of them well.

The Applied Learning performance standards reflect the nine areas of competence defined in the “Framework for Applied Learning.” But the match is not complete. M6, M5, S4, and S5 embody many of the competencies that were defined by the “Framework for Applied Learning” in “Using mathematical tools and techniques” and “Using technology.” These competencies have not been duplicated in the Applied Learning. However, the Applied Learning standards include an explicit requirement that students use information technology to assist in gathering, organizing, and presenting information. At the high school level, the requirements include using appropriate software to create documents, data bases, and spreadsheets, in addition to using on-line resources. Given the importance of ensuring all students develop the capacity to make effective use of information technology, we resolved that the overlap among the standards in this area was warranted. (See “Introduction to the performance standards for Science,” page 80, for discussion of the resource issues related to this requirement.)

Another area in which we decided that some overlap was warranted relates to A2. The first part of this standard, which involves an oral presentation, is similar to one of the requirements of the Speaking, Listening, and Viewing standard in English Language Arts (E3). The difference is that the Applied Learning standard focuses explicitly on presenting project plans or results to an audience with expertise in the relevant subject matter, while the purpose and audience for the presentation are not specified in E3. As the cross-referencing of examples under the performance descriptions indicates, oral presentations that meet the requirements of A2b may also satisfy the requirements of E3c; however, the reverse would not necessarily be the case. A2b is also similar to the report included in E3c. However, A2b requires a specific purpose and audience, whereas these are not specified by the Writing standard. Accordingly, a report produced to meet the requirements of A2b may also satisfy the requirements of E3c, but the reverse would not necessarily be true.

The capacities defined by the tools and techniques standards (A2, A3) are difficult to pin down. There is a tendency to describe them in terms of general dispositions that render them almost impossible to assess in any credible way. Each of these standards is defined in terms of a work product or performance that students can use to provide concrete evidence of their achievement. The overall set of products and performances required to meet the standards is similar at each grade level, but the specific requirements differ and grow in demand from elementary to high school. (See “Appendix IV: The Grade Levels Compared: Applied Learning,” page 168.)

The first year of developmental testing of Applied Learning portfolios in 1995-96 provided an opportunity to test these performance standards (as they were presented in the Consultation Draft) in practice. Students in about 50 classrooms conducted projects designed around the standards. Their experience and the experience of the teachers who supported them was a valuable source of information for refining the performance descriptions. Refinements were also made in response to reviews by representatives of business and industry groups and community youth organizations, such as 4-H, Girl Scouts of the U.S.A., Boy Scouts of America, Junior Achievement, and Girls and Boys Clubs of America. The refinements were largely confined to the detail of the performance descriptions, but there were two more significant changes, both related to A2. The first was the definition of more explicit requirements for using information technology, especially at the high school level, in response to comments from business and industry representatives. The second was the inclusion of a specific requirement for “research” as set out in A3a. Research was implicit in the draft performance standards. The decision to make it explicit arose in the process of review of student projects where it was clear that the successful projects were those in which students had invested energy in research and could demonstrate that research in the work they produced.

Experience in using the standards to shape student work raised several issues. It was notable that most projects focused on “design” and on “planning and organizing.” There were fewer examples of “improving a system.” This was not surprising, but indicates the need to focus attention on gathering examples of such projects.

The circumstances in which the projects were conducted varied markedly. Some projects were initiated by the teacher and some were initiated by students; some projects were conducted by whole classes, some by small groups of students, and some by individuals; some projects were conducted as part of classroom work and some were conducted largely outside class. It was clear, however, that regardless of how a project was initiated, a critical part of its success was the development of a sense of responsibility among the students involved for figuring out the work that needed to be done to complete the project and for making sure that the work got done. What was less clear were the relative merits of different arrangements of whole class, small group, and individual projects. A further question was the appropriate level of scaffolding of projects by teachers and the degree of scaffolding that is appropriate at different grade levels. Our capacity to resolve this last issue was complicated by the fact that, for most of the teachers and students involved, these were the first projects of this sort they had ever undertaken. The work samples and commentaries should be read with this fact in mind. These are issues that can only be resolved through practice and experience.
A1 Problem Solving

Apply problem solving strategies in purposeful ways, both in situations where the problem and desirable solutions are clearly evident and in situations requiring a creative approach to achieve an outcome.

The student conducts projects involving at least two of the following kinds of problem solving each year and, over the course of high school, conducts projects involving all three kinds of problem solving.

- **Design a Product, Service, or System**: Identify needs that could be met by new products, services, or systems; and create solutions for meeting them.
- **Improve a System**: Develop a better understanding of the way systems of people, machines, and processes work; troubleshoot problems in their operation; and devise strategies for improving their effectiveness.
- **Plan and Organize an Event or an Activity**: Take responsibility for all aspects of planning and organizing an event or activity from concept to completion, making good use of the resources of people, time, money, and materials and facilities.

Each project should involve subject matter related to the standards for English Language Arts, and/or Mathematics, and/or Science, and/or other appropriate subject content.

**Design a Product, Service, or System**

A1 a The student designs and creates a product, service, or system to meet an identified need; that is, the student:

- develops a design proposal that:
  - shows how the ideas for the design were developed;
  - reflects awareness of similar work done by others and of relevant design standards and regulations;
  - justifies the choices made in finalizing the design with reference, for example, to functional, aesthetic, social, economic, and environmental considerations;
  - establishes criteria for evaluating the product, service, or system;
  - uses appropriate conventions to represent the design;
  - plans and implements the steps needed to create the product, service, or system;
  - makes adjustments as needed to conform with specified standards or regulations regarding quality or safety;
  - evaluates the product, service, or system in terms of the criteria established in the design proposal, and with reference to:
    - information gathered from sources such as impact studies, product testing, or market research;
    - comparisons with similar work done by others.

**Examples of designing a product, service, or system include:**

- Design software for managing portfolio work. 2b, 4a
- Design an electricity-powered vehicle to enter in a competition. 2a, 5a, 5b, 5c, 5d, 5e, 5f
- Design a plan for development of a park recreation area. 2a, 2c, 5a, 5b, 5c, 5d, 5e, 5f
- Design and build a staircase. M2a, M6e, M6l, M8c
- Design a market research service, providing advice on best-value products. 3b, 5a, 5b, 5c, 5d, 5e, 5f
- Design a business plan for publication of a magazine. M3a, M3b, M3c
- Design and build a cantilevered wooden deck. 2a, M2a, M2b, M2c, M6e, M6l, M8c
- Design a tourist guide for the local area. 2c, 3b, 5c, 5d, 5e, 5f
- Design a tutoring program in desktop publishing. 2b, 5b

**Improve a System**

A1 b The student troubleshoots problems in the operation of a system in need of repair or devices and tests ways of improving the effectiveness of a system in operation; that is, the student:

- explains the structure of the system in terms of its:
  - logic, sequences, and control;
  - operating practices, that is, the mathematical, scientific, and/or organizational principles underlying the system;
- analyzes the way the system works, taking account of its functional, aesthetic, social, environmental, and commercial requirements, as appropriate, and using a relevant kind of modeling or systems analysis;
- evaluates the operation of the system, using qualitative methods and/or quantitative measurements of performance;
- develops and tests strategies to put the system back in operation and/or optimize its performance;
- evaluates the effectiveness of the strategies for improving the system and supports the evaluation with evidence.

**Examples of troubleshooting problems in the operation of a system in need of improvement**

- Troubleshoot and repair faults in the operation of an automobile, tractor, or computer-based communications system.
- Customize applications software for financial management to better suit a specific use. 2b, 4a, 5c
- Improve the system of waste management in a community access area. 2e, 5c, 5d, 5e, 5f
- Improve the yield of a farm or garden plot. 2a, 3a, 5b, 5d, 5e, 5f
- Improve the system for emergency evacuation of the school. 2a, 2b, 5c

**Plan and Organize an Event or an Activity**

A1 c The student plans and organizes an event or an activity; that is, the student:

- develops a planning schedule that:
  - is sensible in terms of the goals of the event or activity;
  - is logical and achievable;
  - reflects research into relevant precedents and regulations;
  - takes account of all relevant factors;
  - communicates clearly so that a peer or colleague could use it;
- implements and adjusts the planning schedule in ways that:
  - make efficient use of time, money, people, resources, facilities;
  - reflect established priorities;
  - respond effectively to unforeseen circumstances;
- evaluates the success of the event or activity using qualitative and/or quantitative methods;
- makes recommendations for planning and organizing subsequent similar events or activities.

**Examples of planning and organizing an event or activity include:**

- Organize a public exhibition of student artwork. 4a
- Organize a weekend volunteer cleanup of a neighborhood. 3a
- Arrange a series of career information seminars. 5a
- Organize a community festival to promote local businesses.
- Organize a team sports tournament. M1a, M5
- Organize a schedule for a series of events such as concerts, lectures, and workshops. M1a, M3a, M3b, M5
- Organize a series of activities including musical, theatrical, and visual art performances. M1a, M3a, M3b, M5
A2 Communication Tools and Techniques

Communicate information and ideas in ways that are appropriate to the purpose and audience through spoken, written, and graphic means of expression.

A2 a The student makes an oral presentation of project plans or findings to an audience with expertise in the relevant subject matter; that is, the student:
- organizes the presentation in a logical way appropriate to its purpose;
- adjusts the style of presentation to suit its purpose and audience;
- speaks clearly and presents confidently;
- responds appropriately to questions from the audience;
- evaluates the effectiveness of the presentation and identifies appropriate revisions for a future presentation.

Examples of oral presentations include:
A presentation of a design for a building or cantilevered wooden deck to an audience including an architect and civil engineer; or designs for a vehicle to an audience including a person with expertise in electronics. 1a, 5a, E3c
A presentation of proposals for design of a recreation area to the local parks authority. 1a, 2c, 5a, 5b, E3c
A presentation of findings of research into the system for emergency evacuation of the school to a panel including representatives of the police and fire departments. 1b, 2b, 5c, E3c
A presentation of a report on improving the yield of a farm or garden plot at an agricultural field day or horticultural show. 1b, 3a, E3c

A2 b The student prepares a formal written proposal or report to an organization beyond the school; that is, the student:
- organizes the information in the proposal or report in a logical way appropriate to its purpose;
- produces the proposal or report in a format similar to that used in professionally produced documents for a similar purpose and audience.

Examples of written proposals and reports include:
A proposal to a software design company for marketing software. 1a, 4a
A submission to a community organization in response to its request for a proposal to develop customized financial management software. 1b, 4a, 5c
A briefing for the school board on results of the investigation of the system for emergency evacuation of the school. 1b, 2a, 5c

A2 c The student develops a multi-media presentation, combining text, images, and/or sound; that is, the student:
- selects an appropriate medium for each element of the presentation;
- uses the selected media skillfully, including editing and monitoring for quality;
- achieves coherence in the presentation as a whole;
- communicates the information effectively, testing audience response and revising the presentation accordingly.

Examples of multi-media presentations include:
A presentation of proposals for design of a recreation area, combining video, graphics, and text. 1a, 2a, 5a, 5b
An oral presentation incorporating electronically produced graphics and videotape to explain proposals for improving waste management. 1b, E3c
A videotaped guide to tourist attractions in the area, combining music, still and moving images, and text. 1a, 3a, 3b, 5c

The cross-references that follow the examples illustrate some of the ways by which a single Applied Learning project may provide a vehicle for demonstrating achievement of several parts of the standards. The cross-references are based on the examples that are linked to the Problem Solving standard. It is intended that students demonstrate their achievement of the four tools and techniques standards in conjunction with Problem Solving projects.
A3 Information Tools and Techniques

Use information gathering techniques, analyze and evaluate information, and use information technology to assist in collecting, analyzing, organizing, and presenting information.

A3 a The student gathers information to assist in completing project work; that is, the student:
- identifies potential sources of information to assist in completing the project;
- uses appropriate techniques to collect the information, e.g., considers sampling issues in conducting a survey;
- interprets and analyzes the information;
- evaluates the information in terms of completeness, relevance, and validity;
- shows evidence of research in the completed project.

Examples of gathering information to assist in completing project work include:
- Research information about soil types and their impact on productivity in the project to improve the yield of a far or garden plot. 1b, 2a
- Research local public safety regulations to assist in organizing a weekend volunteer cleanup of a neighborhood. 1b, 2a
- Research the history of local landmarks in preparing a tourist guide for the local area. 1a, 2a, 3b, 5c

A3 b The student uses on-line sources to exchange information for specific purposes; that is, the student:
- uses e-mail to correspond with peers and specialists in the subject matter of their projects;
- incorporates into e-mail correspondence data of different file types and applications.

A3 c The student uses word-processing software to produce a multi-page document; that is, the student:
- uses features of the software to create and edit the document;
- uses features of the software to format the document, including a table of contents, index, tabular columns, charts, and graphics;
- uses features of the software to create templates and style sheets for the document.

Examples of using word-processing software to produce a document include:
- Produce the proposal to the local parks authority for design of a recreation area. 1a, 2a, 5a
- Produce a proposal to a software design company for marketing software. 1a, 2b, 4a
- Produce submission to a community organization in response to a request for a proposal to develop customized financial management software. 1b, 2b, 3e, 4a, 5c

A3 d The student writes, adds content to, and analyzes a data base program that uses a relational data base; that is, the student:
- writes a program capable of handling data with at least two files;
- creates macros to facilitate data entry, analysis, and manipulation;
- creates multiple report formats that include summary information;
- merges data from the data base with other files.

Examples of creating a data base include:
- Create a data base for volunteers for the weekend cleanup of a neighborhood. 1a, 3a
- Create a data base of participants in a team sports tournament. 1b, 2a
- Create a data base of works to be exhibited in a public exhibition of student artwork. 1b, 4a

A3 e The student creates, edits, and analyzes a spreadsheet of information that displays data in tabular, numeric format and includes multiple graphs; that is, the student:
- creates a spreadsheet that displays the use of formulas and functions;
- uses features of the software to sort, arrange, display, and extract data for specific purposes;
- uses features of the software to create multiple spreadsheets and to synthesize the spreadsheets into a single presentation.

Examples of creating a spreadsheet include:
- Create a spreadsheet to record and analyze data related to the performance of a vehicle designed to enter in a competition. 1a, 2a, 5a
- Create a spreadsheet as part of customizing applications software for financial management. 1b, 2b, 3e, 4a, 5c
- Create a spreadsheet to record and analyze data related to improving the productivity of a farm or garden plot. 1b, 2a
A4 Learning and Self-management Tools and Techniques

Manage and direct one's own learning.

A4 a The student learns from models; that is, the student:
• consults with and observes other students and adults at work and analyzes their roles to determine the critical demands, such as demands for knowledge and skills, judgment and decision making;
• identifies models for the results of project work, such as professionally produced publications, and analyzes their qualities;
• uses what he or she learns from models in planning and conducting project activities.

Examples of learning from models include:
Shadow a software designer at work. 1a, 2b
Undertake volunteer work in a community organization and assist in the management of financial records. 1b, 2b, 5c
Gain work experience in a museum and study the work of a curator in mounting an exhibition. 1t

A4 b The student reviews his or her own progress in completing work activities and adjusts priorities as needed to meet deadlines; that is, the student:
• develops and maintains work schedules that reflect consideration of priorities;
• manages time;
• monitors progress towards meeting deadlines and adjusts priorities as necessary.

Examples of using tools and techniques for reviewing one's own progress include:
Maintain project log books.
Use project management software.
Develop flow charts for determining the sequence in which tasks need to be tackled.

A4 c The student evaluates his or her performance; that is, the student:
• establishes expectations for his or her own achievement;
• critiques his or her work in light of the established expectations;
• seeks and responds to advice and criticism from others.

Examples of using tools for evaluating one's own performance include:
Have a friend videotape an oral performance to allow for review.
Ask a professional in the relevant field to review a draft design.
Ask a friend to review a draft report.

A5 Tools and Techniques for Working With Others

Work with others to achieve a shared goal, help other people to learn on-the-job, and respond effectively to the needs of a client.

A5 a The student participates in the establishment and operation of self-directed work teams; that is, the student:
• defines roles and shares responsibilities among team members;
• sets objectives and time frames for the work to be completed;
• establishes processes for group decision making;
• reviews progress and makes adjustments as required.

Examples of working in teams include:
Work in a team to design and build a vehicle to enter in a competition. 1a, 2a, 2b
Work in a team to design a recreational area. 1a, 2a, 2b, 5b
Work in a team to organize a series of seminars on careers. 1c

A5 b The student plans and carries out a strategy for including at least one new member in a work program; that is, the student:
• plans and conducts an initial activity to introduce the new member to the work program;
• devises ways of providing continuing on-the-job support and advice;
• monitors the new member's progress in joining the program, and revises the kinds and ways of providing support and advice accordingly;
• reviews the success of the overall strategy.

Examples of including new members in a work program include:
Respond to growth in demand for a market research service by including a partner in the enterprise. 1a, 3b
Provide training to other students on how to develop and conduct a tutoring program, based on experience in devising and running a tutoring program on desktop publishing. 1a, 3b
Include a student new to the school in an ongoing project, such as a project to design a proposal for use of a park recreation area. 1a, 2a, 2b, 5a

A5 c The student completes a task in response to a commission from a client; that is, the student:
• negotiates with the client to arrive at a plan for meeting the client's needs that is acceptable to the client, achievable within available resources, and includes agreed-upon criteria for successful completion;
• monitors client satisfaction with the work in progress and makes adjustments accordingly;
• evaluates the result in terms of the negotiated plan and the client's evaluation of the result.

Examples of responding to a commission from a client include:
Produce a tourist guide to the local area at the request of the local tourist authority. 1a, 2a, 3a, 3b
Customize applications software for financial management at the request of a community organization. 1b, 2b, 4a
Conduct an investigation of procedures for emergency evacuation of the school in response to a request from the school board. 1b, 2a, 2b
The task

Students were required to complete an application project that would develop their skills in gathering and using information, communication, and problem solving, and help them to become self-directed learners. The students defined the project and acquired a mentor from outside the school to assist them. The students were supervised by a teacher throughout the process of developing a proposal and planning a presentation of the project. This student designed an electric car for a local competition.

Circumstances of performance

The student worked as a member of a team to get most of the work done. This student was also the actual driver of the car in competition. The team worked with an adult mentor and a teacher advisor. The students were required to maintain a journal to record the time they spent on the project. The work culminated in a presentation to interested adults and peers.

What the work shows

A1 - Problem Solving: The student designs and creates a product, service, or system to meet an identified need; that is, the student:
- develops a design proposal that:
  - shows how the ideas for the design were developed;
  - reflects awareness of similar work done by others and of relevant design standards and regulations;
  - justifies the choices made in finalizing the design with reference, for example, to functional, aesthetic, social, economic, and environmental considerations;
  - establishes criteria for evaluating the product, service, or system;
  - uses appropriate conventions to represent the design;
- plans and implements the steps needed to create the product, service, or system;
- makes adjustments as needed to conform with specified standards or regulations regarding quality or safety;
- evaluates the product, service, or system in terms of the criteria established in the design proposal, and with reference to:
  - information gathered from sources such as impact studies, product testing, or market research;
  - comparisons with similar work done by others.

The proposal explains the genesis of the project: the P.U.D. (Public Utilities Department) provided the school with an electric motor, a speed control, and two batteries as the basis for designing and building an electric or solar-electric vehicle for entry in a competition with other schools in the local area.

The process of design of the vehicle emerged through the “Proposal Paper,” “Time Line,” and journal. The proposal records the plan the student envisaged early in the process. This plan is reflected in the timeline. The journal provides insight into the reality of the design process, especially the ways in which the students responded to problems they encountered as the design took shape.
The students began by building a wooden mock-up for the vehicle (not shown).

The proposal records some of the design issues that the student envisaged would require resolution. These are reflected in the “Time Line.”

The journal records some of the problems the students encountered and the strategies they adopted to solve them.

The design solutions reached during the course of construction of the vehicle are justified in terms of functional considerations.

The student established criteria for evaluating the design.

Apart from reference to the mock-up (which is one of the ways of presenting a design for a product of this sort), there is no reference to the presentation of design plans.

The proposal notes some of the skills the student identified he would need to learn in order to complete the project.

The time line records the planned steps for turning the design into a reality while the journal entries record the ways in which those steps were achieved in practice and the modifications to the process the students made along the way.

The proposal and journal contain several references that demonstrate attention to relevant regulations and to matters related to safety.

The students devoted a lot of time and energy to testing their design and to trying out strategies to improve its performance and efficiency. The strategies included analysis of records of performance.

The students were very aware of comparisons with other vehicles built for the competition. Even the use of “XXX” in the journal indicates an awareness that other electric car developers could gain advantages from the information the students gathered in their tests.
Learning and Self-management Tools and Techniques: The student learns from models; that is, the student:

- consults with and observes other students and adults at work and analyzes their roles to determine the critical demands, such as demands for knowledge and skills, judgment and decision making;
- identifies models for the results of project work, such as professionally produced publications, and analyzes their qualities;
- uses what he or she learns from models in planning and conducting project activities.

The proposal records the difficulties the students experienced in identifying a mentor, though they eventually succeeded in finding a person who had taken part in a similar project.

The team also made extensive use of the assistance of teachers with knowledge and expertise in areas such as welding. The student's recognition of the importance of these models to the eventual result is evident throughout the journal.
ElectroHawk 1

In order to protect the driver from side splashing in the event of a rollover, we also connected the support for the side and completed the front detail.

4/21 (10 hrs)

Tonight was the longest night I have ever worked on this car yet. We worked until midnight. We kind of had to since the power steering is in place. Tonight we worked on many things: the front suspension, the steering system was adjusted to work; to make sure we had a tight enough turn. So we submit to us as a demanding task. We also attempted to wire the vehicle and check the schematics. I made several trips at first but we were able to get more of a schedule. My boss spent most of the evening working on things we needed such as a correct sized wire, sparkers, chucks, and other equipment. We all eventually got a little more work left so we decided to call it quits and return early to the monitoring room before all the little unimportant form.

4/22 (6 hrs)

Today was busy inspection and practice day. Before we headed out for the race track we still had a few things that needed to be done. Some minor adjustments as well as electrical wiring. We worked hard and fast to get everything done that needed to be done. We still didn't get it all done. It was time to head out to the track and we packed up and headed out to the track and we took our time there. Once we arrived at the race track we immediately began work on the electrical system and learning. And just as quickly as we got started working on the electric system, quickly grew in other teams came due to the need for a good driver and safety inspection. We actually raised the flag for only 5 minutes. But then the minutes turned into hours with a few cars still going. We pushed the throttle forward; there was no point. I pushed the throttle again and still there was no response. I then turned around and put the car back to the starting line. Very quickly we got the tail headlight back on and we realized that these 180s weren't right for us. We remained by the vehicle missing the race. And that was time to end our evening.

5/9 (4 hrs)

Today we disassembled the car so that we could get our chassis painted. We also had to make a temporary switch to do this. Brian also got to work making his rear engine rear and we were able to get the engine back. This evening I was asked to make a schedule and some charts to give our car performance. We also made repairs to the body with filler.

5/10 (5 hrs)

We passed the chassis so that it wouldn't rust on us. We also did a little weighing of the car's weight. We concluded that our motor was running at 15.4 miles per hour.

5/11 (7 hrs)

Today we passed the body completely. I personally think it looks a little better now. We also started working on the front brakes. A decision was made to change our gear ratio to 6:1 for efficiency. We still can't hear from the motor that a 6:1 motor is more efficient for the race. And then we decided that our motor is most efficient running at 50 RPM. We also got some wheels to replace the one from the rear wheels.

5/16 (5 hrs)

Today we passed. We were getting the car's front brakes done. We also discussed the long process of putting the body together again. We also worked on the rear wheel and got the rear motor. And we got the air-scoop for the motor put onto the body.

5/1/4 (1 hrs)

Today I painted the air-scoop plus the bonnet and the body on. We also got the rear seat section together and in the top of the car, we moved closer for the rear seat area that was completed as well as the bumper text which told us that 5 of the 6 batteries are pretty much not needed for the race.


ElectroHawk 1

A4b Learning and Self-management Tools and Techniques: The student reviews his or her own progress in completing work activities and adjusts priorities as needed to meet deadlines; that is, the student:

• develops and maintains work schedules that reflect consideration of priorities;
• manages time;
• monitors progress towards meeting deadlines and adjusts priorities as necessary.

F The work schedule was established in the timeline.

M The journal records several instances in which the students found it necessary to adjust their priorities in order to deal with unforeseen problems and to meet deadlines.

A4c Learning and Self-management Tools and Techniques: The student evaluates his or her performance; that is, the student:

• establishes expectations for his or her own achievement;
• critiques his or her work in light of the established expectations;
• seeks and responds to advice and criticism from others.

The proposal and journal reflect the student’s expectations for his own achievement. The journal also records the student’s analysis of his work in light of those expectations. The entries focus on the efforts he and his fellow team members made to reach a satisfactory result, rather than a detailed analysis of the student’s own performance. There is also evidence of seeking and responding to advice, especially from the teachers who provided assistance to the team.

The student’s recognition of his accomplishments is evident throughout the written work, as is his pride which comes through in a humble voice.
AS a Tools and Techniques for Working With Others:
The student participates in the establishment and operation of self-directed work teams; that is, the student:
• defines roles and shares responsibilities among team members;
• sets objectives and time frames for the work to be completed;
• establishes processes for group decision making;
• reviews progress and makes adjustments as required.
It is clear from the journal entries that the work was a team effort, though there are few references to the definition of roles and responsibilities or of the processes the team established for decision making. The journal also makes it clear that the students took responsibility for the project despite the close involvement and assistance of their advisors.

The proposal and timeline establish the objectives and time frame and the journal provides evidence that the team reviewed their progress and made adjustments as required.

The student makes several references to the importance of teamwork in arriving at the goal of winning the competition. He notes also the connection between a strong team and the quality of the vehicle, and the connection between quality and safety.

The written work included with this project contains some errors, e.g., “parameters” is misspelled in the proposal; and the journal contains errors such as “allot” and “to” (instead of “too”) and errors in the spelling of “available,” “interview,” and “awesome.” Never-
The task
Chemistry students were asked to determine the most effective, economical, and environmentally safe grass fertilizer for the school district. The students were to produce an analytical report with detailed procedures and conclusions and to make a recommendation to the school district's Grounds and Maintenance Department.

Circumstances of performance
The students were given seven weeks to complete the project. They were responsible for all arrangements, such as making contacts with outside resources and obtaining permissions needed to complete the plan. Class time was used to visit other campuses for soil collection, and time outside the school day was also used to complete various parts of the project. The students divided into groups with responsibility for specific components of the project plan. The Director of the Grounds and Maintenance Department for the school district worked closely with the class during the project both as an advisor and as a client who would benefit from the project. The teacher facilitated the project and assisted the students as a resource person. Much of the work was completed as practical science work.

What the work shows

- **Problem Solving: The student troubleshoots problems in the operation of a system in need of repair or devises and tests ways of improving the effectiveness of a system in operation; that is, the student:**
  - explains the structure of the system in terms of its:
    - logic, sequences, and control;
    - operating principles, that is, the mathematical, scientific and/or organizational principles underlying the system;
  - analyzes the way the system works, taking account of its functional, aesthetic, social, environmental, and commercial requirements, as appropriate, and using a relevant kind of modeling or systems analysis;
  - evaluates the operation of the system, using qualitative methods and/or quantitative measurements of performance;
  - develops and tests strategies to put the system back in operation and/or optimize its performance;
  - evaluates the effectiveness of the strategies for improving the system and supports the evaluation with evidence.

### This work sample illustrates a standard-setting performance for the following parts of the standards:

- **A1** Problem Solving: Improve a system.
- **A2** Communication: Prepare a formal written proposal or report.
- **A5 a** Working With Others: Participate in the establishment and operation of a self-directed work team.
- **A5 c** Working With Others: Complete a task in response to a commission from a client.

[^118: High School Applied Learning]
C D E F evaluated the system using quantitative measures; and
H made recommendations for improved techniques for managing the system based on analysis of fertilizers.

The students submitted their report to the Director of the Grounds and Maintenance Department and produced a set of procedures for revised practices in lawn maintenance to be used by grounds keepers, which was published by the Grounds and Maintenance Department.

This project illustrates an appropriate task for the high school level. Its scope extended beyond the school and immediate community of the students. It involved consideration of a range of factors including implications for cost. Finally, the project led to changes in practice.
Caring for Your Campus Lawn

**Current FWISD Fertilizing Practices**

During play, games, and events, the FWISD grow fast grass. After the limited coverage is over, apply grass to grow. The current practices call for the grass to be fertilized four times during the summer season and twice during the fall season.

**Fertilizing Lawns**

The most common grasses used are the FWISD Bermuda. The lawn has been fertilized on March 10th and is bermuda. The best time to fertilize is in April. The recommended amount of fertilizer is 1.5 lbs of nitrogen per 1000 sq ft. per year.

**SOIL TESTING RESULTS**

**NITROGEN, PHOSPHORUS, AND POTASSIUM**

<table>
<thead>
<tr>
<th>Soil</th>
<th>P</th>
<th>K</th>
<th>Sulfate of Ammonium</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil</td>
<td>1.426</td>
<td>1.426</td>
<td>1.426</td>
<td>1.426</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.426</td>
<td>1.426</td>
<td>1.426</td>
<td>1.426</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Caring for Your Campus Lawn

SOIL TESTING OBSERVATIONS

Out of the 15 schools sampled this year, 10 were found to be below the standard for phosphorus and potassium. These 10 schools were low in phosphorus, two were moderate, three were high, and two were very high in phosphorus.

The soil tested ranged from 7.5 to 6.1 (7.5 lowest, 6.1 highest). We found that two of the samples had a pH level of 8 or more. The average nitrogen content had a pH level of 7.5 to 7.8.

PREPARING SOIL SAMPLES

For tests, samples or plants, use the soil sample tests about 3 to 5 inches below the surface. For potatoes, especially potatoes in the southwest and central part of the sample should be taken 4 inches deep. Avoid testing the soil with your hands. Place the soil in one of the containers. Be sure the container is filled with water and is kept in a dry cool and dark place. This is not essential, however, it stimulates growth with the same number. Forwards any mixed soils, organic materials are not used for green, soil or more of this kind. Each, or use the sample every three times and use it thoroughly.

That different size of your soil, an is may either according to what culture, understanding and difference of a local condition. It is recommended to make individual tests on separate samples from different areas, then to make the samples together.

TESTING PROCEDURES

1. Fill the exhaust attachment with 1 part of soil sample and 1 part water.
2. Thoroughly close the soil and water together for at least one minute and then allow the mixture to settle out. Wait 10 minutes before proceeding. If soils in the exhaust are mixed will vary according to the type of soil you have. Rinse your test tube slowly until all materials are removed. The clarity of the attachment will also vary from very clear to very cloudy. Cloudiness will not affect the accuracy of the test.
3. Pour the appropriate amount for the test you wish to make. Remember the soil and close the exhaustion of the saliva which should be the same color as the cap. Make sure the upper cap is off. In pieces and spread evenly on the sample to avoid any excess.
4. Using the dropper provide, take the right amount necessary, on the file mark on the chart, with maximum from your well samples. Avoid disturbing the equipment - something only liquid.
5. Fill the exhaust chamber with the exhaust sample until there is no more.
6. Remember to empty the appropriate collected suspension from the both caps.
7. Calibrating measures the two brands and pour the sample in the test chamber.
8. Fill the test tube from the suspension, making sure it is coated properly and does tightly, within the first hour.
9. Allow the soil to dry before moving to the next chamber by the following procedures: 2 for 1 part: Nitrogen - 10 parts, Phosphorus and Potassium - 5 parts. Under the weight of rolling, spread the compound material mixes to make a uniform color. Pour compound material of the suspension in the tube chamber.
Caring for Your Campus Lawn

Dear Dr. __________

Thank you for having our class today at the biological lab. We greatly appreciate your time and expertise. Our project objective is to determine the most efficient, economical, and environmentally safe lawn care for the Fort Worth High School. Our plan is to develop an F1 study report with detailed photographs and drawings and a comprehensive report for the Fort Worth, High School and Facilities Department. We only have 2 weeks to complete our research.

Please look for Summaries 4 and 5. We are only concerned with the first 2 reports. Please note the changes in the charts. We need an analysis as soon as possible. Also, please send us the written report with information on how to integrate the data.

Sincerely,

[Signature]
Caring for Your Campus Lawn

The project led to the production of a formal written report to the Director of the Grounds and Maintenance Department for the school district. The report clearly sets out the procedures the students followed and their findings. It adopts a memorandum format appropriate to communicating a technical report of this sort, particularly one produced effectively in-house, and it is written in a style consistent with a memorandum.

The students also chose the format of a memorandum for the pamphlet they prepared to communicate the project findings to grounds keepers, again an appropriate format. In this document, however, they adjusted the style, making it less discursive and more direct. This is appropriate, given the purpose of the pamphlet which was to provide directions. The information is set out clearly and logically, consistent with its purpose. See page 45 for commentary on this memorandum as a functional document within the requirements of the English Language Arts standards.

These documents are presented as finished work, as is appropriate to their purposes and audiences. The polish of these documents can be compared with the errors that appear in the Proposal to the Principal and with errors in some of the students’ working documents.
Caring for Your Campus Lawn

**A5 a** Tools and Techniques for Working With Others: The student participates in the establishment and operation of self-directed work teams; that is, the student:
- defines roles and shares responsibilities among team members;
- sets objectives and time frames for the work to be completed;
- establishes processes for group decision making;
- reviews progress and makes adjustments as required.

**B** The timetable indicates that students shared the load of the work required for the project by forming groups, each with responsibility for a specific component of the project. The record suggests cooperation among the groups to set objectives and maintain time frames. However, the available evidence does not allow for commentary on the effectiveness of the work processes the students adopted or their strategies for reviewing progress.

**A5 e** Tools and Techniques for Working With Others: The student completes a task in response to a commission from a client; that is, the student:
- negotiates with the client to arrive at a plan for meeting the client's needs that is acceptable to the client, achievable within available resources, and includes agreed-upon criteria for successful completion;
- monitors client satisfaction with the work in progress and makes adjustments accordingly;
- evaluates the result in terms of the negotiated plan and the client's evaluation of the result.

The client for this work was the Director of the Grounds and Maintenance Department for the school district. The memorandum to the Director documents communication between him and the students during the course of the project. But there is no evidence documenting negotiation of the plan or documenting the monitoring of the Director’s satisfaction with the work in progress. The pamphlet the students wrote for grounds keepers, setting out procedures for lawn maintenance, appears under the title of the Grounds and Maintenance Department, which suggests that the Director was satisfied with the students' report and accepted their recommendations.

The written work included with this project contains some errors. For the main part the errors are confined to working documents which were not intended for publication. The three pieces of finished writing are the Proposal to the Principal (which contains an error in the spelling of “maintenance”), the memorandum to the Director, and the notice to grounds keepers.

The wide range of lawn areas of the various school campuses raises doubt about the adequacy of the sample used to arrive at the estimate of total lawn area. Given its derivation from the sample, the use of the exact figure (1,426,127 square feet) for some calculations is inaccurate. Rounding the figure to 33 acres is preferable, as used in “Organic vs. Inorganic.”
Work Sample & Commentary: Baseball Field

The task
Students were required to complete an application project that would develop their skills in gathering and using information, communication, and problem solving, and help them to become self-directed learners. The students defined the project and acquired a mentor from outside the school to assist them. The students were supervised by a teacher throughout the process of developing a proposal and planning a presentation of the project. This student undertook the resurfacing of the high school’s baseball field. The school district would not fund the renovation. Therefore, the student assumed responsibility for soliciting donations and materials, and planning for the restoration.

Circumstances of performance
The project to resurface the baseball field lasted for approximately five months, beginning in the fall semester. The student logged 157 hours in his journal. Parts of the project were fostered through assistance from a mentor (summer baseball coach), supportive parents, and a small group of volunteers. The student received feedback in class from his teacher and peers; however, much of the project was done outside class.

What the work shows
A1 b Problem Solving: The student plans and organizes an event or an activity; that is, the student:
- develops a planning schedule that:
  - is sensible in terms of the goals of the event or activity;
  - is logical and achievable;
  - reflects research into relevant precedents and regulations;
  - takes account of all relevant factors;
  - communicates clearly so that a peer or colleague could use it;
- implements and adjusts the planning schedule in ways that:
  - make efficient use of time, money, people, resources, facilities;
  - reflect established priorities;

A1 b  respond effectively to unforeseen circumstances;
A1 b  evaluates the success of the event or activity using qualitative and/or quantitative methods;
A1 b  makes recommendations for planning and organizing similar events or activities.

This project has characteristics both of improving a system and of planning and organizing an event or activity. It is described, here, with respect to planning and organizing an event or activity.

A The proposal establishes the problem to be solved. It describes the condition of the field: “...the poor quality of the infield grass, pitchers [sic] mound, and base-paths.” The proposal contrasts this with the qualities of other baseball fields and describes the student’s dream of turning his home field into a field of the quality that other teams would want to play on.

B The plan is logical and achievable. It takes account of relevant factors, such as the need for the materials and labor to complete the project, and the need to dispose of the materials removed from the site. The plan communicates clearly and would provide a useful checklist for anyone else embarking on a similar venture.
Baseball Field

The plan is supplemented by the discussion in the proposal of factors involved in the renovation of the baseball field, in particular, the factors involved in irrigation of the field and renovation of the drainage system.

The student researched relevant precedents by obtaining information from the school district's athletics director and from sod dealers.

The student obtained information about the regulations governing the layout and dimensions of baseball fields. In his reflection, the student described the pleasure he experienced in "bringing perfection on to the field" by cutting out the required shapes and measuring the angles.

He also attended to safety precautions such as not using sod with netting because, as he explained in the newspaper article, "spikes on shoes might get caught in it and injure the players."

The extract from the student's journal records the implementation of the plan, beginning with 9/7. The steps to executing the plan are explained sensibly and could be followed by someone else.
**K** The proposal devotes considerable attention to the need to obtain donations of materials and money to complete the project. This emphasis is reflected in the journal and in related materials.

**L** The press release outlines the student's strategy for obtaining the donations he needed to complete the project.

**M** The student documented several unforeseen problems that arose and the strategies he adopted to overcome them.

**N** A formal evaluation of the renovated field is not provided. However, the success of the project is implied in the newspaper article.

**O** The reflective statement, “Pretty much everything turned out as I had hoped,” confirms that the project accomplishes most of the goals listed in the Proposal.
Baseball Field

Reflection Paper

For my application project, I re-built the infield at High School. In early September, I removed all of the old sod with a sod cutter that was donated by Santa. Next, I leveled out the dirt, and laid out the new sod. Then, I put the base-paths, built the pitcher's mound, and improved the drainage on the field.

Everything except for the grass was a part of this project, but building it was an exciting way to keep myself busy during the winter vacation.

From the very beginning, I had a good idea of the amount of work that was going to be needed for this project. I spent many more hours than I had expected on little things like leveling the dirt to build a slag for water to run off. My favorite part of the project was bringing the dirt mounds into the field. I liked working out the twenty-eight-foot circle at home plate, and measuring the angles on the base paths.

To make this project successful, I needed to develop some skills that would be helpful along the way. For instance, at least, I had a hard time digging trenches for drainage. But after awhile, I soon became skilled and had people were willing to help. I learned how tough it is for others to stay healthy and keep their weight during the winter vacation alone!

Along the way, I made some difficult times that I needed to go through. When the old sod was still rolling up, there was a man who was going to make it all up and level it off. The night before, his deep truck broke down. That night I went to the city council and asked them if they would help them make it okay for us. They helped my project and agreed to help out with the law and all other ways also. The weather also was a stumbling block that prevented my men and me from working on the field. There were some days that it poured rain and created a sloppy surface.

Through this project, I have learned many things. I have never done anything like this before, so everything here, I did was all new to me. As a result of all the hours that I have put into the field, I now feel some ownership. For instance, whenever I refer to the field, I call it 'my field.' I am very particular about how it is taken care of and will continue to do work on the maintenance on the field.

I am glad that I was able to do a project like this with something that I love and had fun working on. Really, much everything turned out as I had hoped. I wish there would have been some way that I could have protected the grass from the heavy rain. The grass is not as thick and healthy as it was when we installed it, but in the summer it will bounce back. One of the major things that I have achieved in this is working with my own.

The tools and techniques for working with others.
Baseball Field
Learning and Self-management Tools and Techniques: The student learns from models; that is, the student:

• consults with and observes other students and adults at work and analyzes their roles to determine the critical demands, such as demands for knowledge and skills, judgment, and decision making;
• identifies models for the results of project work, such as professionally produced publications, and analyzes their qualities;
• uses what he or she learns from models in planning and conducting project activities.

The documentation demonstrates consistent effort on the part of the student to learn from people who have expertise in areas that will benefit him.

Early on, the student acquired a mentor to support his efforts. The questions the student developed for his initial interview with the mentor indicate attention to the knowledge and skills needed to complete the job.

As the need to obtain donations became apparent, the student established contact with further mentors, members of the local Rotary club, who provided models for community networking.

The press release, letter seeking donations, and wish list reflect the skills the student developed from these mentors.
**Baseball Field**

**Wish List for the Project**

1. Monitor equipment: a 10 yard dump truck to haul the soil that has been cut from the field.  
2. Need a sled to dump the loaded soil.  
3. Pen sprayer or 3/8" wide sprayer. (Approx. 225 yards)  
4. Need a backhoe to load the soil into the dump truck.  
5. Insurance for the new grader to get a new steel (2500).  
6. Choose soil to fill in the low spots. (250)  
7. Plumbing supplies for the irrigation sprinkler system. We have a design but need the supplies. This is to insure protection all year.  
8. Allowance for leveling areas to help drainage.

- 1" rubber hoses for manually watering the field.
- 1,500 ft of 4" high flow hose with reel, valves and supplies. This is for sod to ensure the field is kept unraveled vehicles off the site.

**Time table for the above items**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Need this on October 3rd.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Same as above.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Same as above.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Same as above.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Need on October 3rd.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>This watering.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The week of October 3rd.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>This November/December.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Same as above.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Next spring.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Next spring.</td>
<td></td>
</tr>
</tbody>
</table>

**Things to do this week**

- 9/1-9/5

Need maintenance man’s name, address, phone #.

- Need to send a letter to Mr. in order to get written permission for what I am going to do. Let him know that this is for my notebook. Name, address & phone #.

- Call Mr. ____ to get names, addresses, and phone #’s of who I need to talk to in order to get S for the project. Schedule a time to meet these people.

- Have a plan of procedure: written down to present to the people for the money.

- When is lock-up being put in? Get name, address, and phone # of people involved.

- Keep track of time spent for the project.
The task
Following several fire-related deaths in homes located in a community near the school campus, the students in a high school parenting class identified the need for local residents to become more aware of safety practices. The students assumed responsibility for planning and organizing a fire and home safety project in order to accomplish this goal. The project included home demonstrations of safety practices, installation of smoke detectors, and the distribution of first-aid kits and safety booklets.

Circumstances of performance
The students developed the safety project over a period of six weeks, in partnership with personnel from a local division of the fire department. Working usually in class or during the school day, the students produced work as individuals and in small groups and received feedback from peers and the teacher. The students were also assisted by other adults at the school. The teacher monitored the work to ensure that students accomplished content objectives.

What the work shows
A1 e Problem Solving: The student plans and organizes an event or an activity; that is, the student:
• develops a planning schedule that:
  – is sensible in terms of the goals of the event or activity;
  – is logical and achievable;
  – reflects research into relevant precedents and regulations;
  – takes account of all relevant factors;
  – communicates clearly so that a peer or colleague could use it;

• implements and adjusts the planning schedule in ways that:
  – make efficient use of time, money, people, resources, facilities;
  – reflect established priorities;
  – respond effectively to unforeseen circumstances;
• evaluates the success of the event or activity using qualitative and/or quantitative methods;
• makes recommendations for planning and organizing subsequent similar events or activities.

Having clearly defined a need and a goal, the students formulated a plan and followed it step by step.
to a successful conclusion. The students recorded the process in a scrapbook in such a way that other people can easily follow it. (All the documents and photographs shown here appeared originally in the scrapbook.)

A The project was proposed to the principal by a representative group from the class. The principal’s approval is implied by her approval of this subsequent, related correspondence.

B The students accomplished the goal of increasing the families’ awareness of safety practices by arranging to visit several homes. At the homes, they installed smoke detectors; demonstrated CPR, the Heimlich maneuver, and “Stop, Drop, Roll,” and helped families chart escape routes in case of a fire.

A They made all the arrangements needed to organize the home visits. Their involvement of a captain from the local fire department provided the students with a direct (and essential) source of information and advice on relevant regulations. The captain trained them in administering CPR and the Heimlich maneuver. He also helped them install the smoke detectors when they visited the families.

C D After researching relevant procedures, the students wrote a “Home Safety Check List” for posting in the homes and designed a safety booklet for use by the families. These are extracts from the safety booklet.
Fire and Home Safety

Later, the class collected supplies for first-aid kits that they gave to the families.

The samples contain evidence that the students considered relevant factors and made efficient use of time, people, and resources. Because their resources for funding the project were limited, the students made strategic decisions to explore alternatives. They contacted representatives of several businesses and organizations, including the acting mayor, and asked for donations or supplies in order to provide families with first-aid kits and smoke detectors.

The thank you list confirms their success.

When possible, students located information written in Spanish and included it in their safety materials in order to accommodate bilingual families.

The thank you note from one of the families and the students' own evaluations indicate the activity accomplished its goal. The students used professional practices, hence their assessment of the project as a success was based not only on their opinion but also on comparison of their performance with that of adults who perform these same tasks.
A Communication Tools and Techniques: The student makes an oral presentation of project plans or findings to an audience with expertise in the relevant subject matter; that is, the student:

- organizes the presentation in a logical way appropriate to its purpose;
- adjusts the style of presentation to suit its purpose and audience;
- speaks clearly and presents confidently;
- responds appropriately to questions from the audience;
- evaluates the effectiveness of the presentation and identifies appropriate revisions for a future presentation.

As an integral component of the project, the students made oral presentations in which they combined practical applications with providing useful information. The students used the data they collected to explain home safety practices and then utilized the training they had received in order to demonstrate safety procedures to several families.

The students performed the presentation and demonstration in the presence of a safety expert who accompanied them to the homes of the families. The hands-on nature of the presentation was appropriate for the audience and purpose of the task. The complimentary letter from the expert verifies that the students did “an outstanding job of communicating with...and...instructing [the] families...”
A3 - Information Tools and Techniques: The student gathers information to assist in completing project work; that is, the student:
• identifies potential sources of information to assist in completing the project;
• uses appropriate techniques to collect the information, e.g., considers sampling issues in conducting a survey;
• interprets and analyzes the information;
• evaluates the information in terms of completeness, relevance, and validity;
• shows evidence of research in the completed project.

The project required the collection of information about safety practices.

NO One group of students took responsibility for researching the effects of smoke inhalation and teaching the class about ways of avoiding these effects.

Fire and Home Safety

At the beginning of the project, I really thought that it was a good idea. We were going to be able to teach families how important it is to be ready at one of a fire. I helped develop the home safety book, which included information on what to do in an emergency.

When I learned about the project, I was happy to be involved. Since I'm very shy, it gave me the opportunity to work and get to know them. I didn't choose anything about the project because I was not interested. We provided all the information that was needed and was very important to know.

When we went out to the families we had to demonstrate CPR. We taught families what to do if an adult or young child is choking or not breathing. The group I worked with was very cooperative and friendly. We agreed on everything and helped each other. The visit to the family was fun. They were nice and generous with us. They listened to what we had to say and most important of all, they let us come into their homes.

What I learned during the project was that it is very important to be prepared in case of an emergency. That having an escape route and a meeting place can save many lives. The fire department educated us and in turn we educated the families.

We adopted the Fire Department Captain who works for the fire department educating people in the community about home safety. He was very helpful to us in this project because he provided transportation to families and houses. Captain also helped with the response situation which he and the Department provided.

If I were grading myself I would give myself an A. The reason for this is that I think I explained CPR very good. I got along with my classmates and did what I was told to do. I don't think it was easy, but it was fun. I really came out and did my part for this project.

June 4, 1995

To Whom it May Concern:

It was my pleasure to work with the presenting students at the City of High School on fire and home safety education. The students did an excellent job in providing the following:

- CPR Training
- First Aid Training
- Fire Safety
- Prepared a Home Safety Book that demonstrated different and illustrated types of fires, smoke alarms, and proper fire extinguisher placement.
- Prepared a Home Safety Kit with the essentials for common accidents in the home.

The presenting students did an outstanding job of communicating with the families and sharing important information. It was wonderful working with students and appreciated.

The students were excellent and did an outstanding job of providing information that could potentially save lives by teaching families what to do in case of a fire.

Thank you.

Captain Todd

City of High School

February 12, 2009
Fire and Home Safety

A4 a Learning and Self-management Tools and Techniques: The student learns from models; that is, the student:
• consults with and observes other students and adults at work and analyzes their roles to determine the critical demands, such as demands for knowledge and skills, judgment, and decision making;
• identifies models for the results of project work, such as professionally produced publications, and analyzes their qualities;
• uses what he or she learns from models in planning and conducting project activities.

A5 a Tools and Techniques for Working With Others: The student participates in the establishment and operation of self-directed work teams; that is, the student:
• defines roles and shares responsibilities among members;
• sets objectives and time frames for the work to be completed;
• establishes processes for group decision making;
• reviews progress and makes adjustments as required.

B The itinerary indicates that the students organized themselves into teams to conduct the project with each team taking responsibility for a specific aspect of the project.

J K The students’ self-evaluations provide some evidence of the work processes established by the groups, but do not provide evidence on which to base specific commentary in relation to the criteria identified above.

The written work included with this project contains some errors. For the main part, the errors are confined to working documents which were not intended for publication. The three pieces of finished writing are the proposal, the Home Safety Check List, and the extracts from the safety booklet. These contain virtually error free writing.