# Curriculum Quality Standards for School-to-Work: A Guidebook

## MDS-955

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# INTRODUCTION

While other fields at the secondary level have rapidly embraced national curriculum standards and goals, school-to-work programs continue to vary widely in content, scope, and methodology across the nation. At present, the notion of establishing "national standards" in this content area has focused largely on developing industry skill standards.

Yet, in today's changing world of work, critical evaluation of curriculum is a helpful step toward realizing national goals for education (such as those outlined in Goals 2000) and in fulfilling the vision of new and emerging vocationalism (e.g., Tech Prep, youth apprenticeship, and career academies). Standards for curriculum and instructional products, encompassing appropriate student outcomes and highly effective instruction, would establish important benchmarks for products used by schools and postsecondary institutions in implementing school-to-work initiatives.

# The NCPQ

The National Consortium for Product Quality (NCPQ) is a project funded by the National Center for Research in Vocational Education and directed by the Center on Education and Work, University of Wisconsin-Madison. The NCPQ has been established to accomplish a twofold mission: (1) to develop, research, and implement school-to-work instructional material standards and (2) to develop a national review process by which voluntarily submitted materials can be reviewed, evaluated, and nationally disseminated.

Using information from curriculum practitioners nationwide, the *NCPQ Curriculum Quality Standards for School to Work* guidebook before you is designed to assist practitioners in examining curriculum products, adapting materials, or creating original curriculum. Through research and technical assistance, the NCPQ strives to improve curriculum design and practice. By discussing the focus areas of the Standards, and by documenting good examples that are currently in practice, we hope to provide a richer foundation for your efforts to integrate curriculum design, content, and use. Successful implementation, and subsequent meaningfulness to the learner, are essential components in the process of curriculum development and evaluation. Bearing this fact in mind, we intend this guidebook to present a connected or integrated approach regarding curriculum development and curriculum evaluation.

# NCPQ Services

The NCPQ provides research-based evaluation and technical assistance for local, state, and national developers of curriculum and instructional materials. Its members assist in curriculum networking, identifying curriculum search sources, and reviewing submitted curriculum or printed instructional material. The NCPQ Standards and Indicators provide developers with an essential tool for evaluating both new and existing materials for content, instructional strategies, assessment, and equity and diversity considerations. When curriculum developers submit materials to the NCPQ for formal review, they are assured of a high-quality third-party review and evaluation of materials. The submitted materials may also have the opportunity to progress to a national review, receive awards, and gain valuable exposure via inservice, curriculum networks and organizations, and NCPQ Product Profiles and newsletters.

The NCPQ was formed to serve the education field by advancing curriculum design and practice through meaningful research and technical assistance. National use of the NCPQ Standards, and the opportunity to apply these standards to a host of instructional materials, will help create a positive interface of curriculum design, content, and program use. In the end, that successful interface is critically important to the ultimate beneficiaries of our work: our students.

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# USERS AND USES OF THE NCPQ STANDARDS

Educators and community members will find that the Instructional Material Quality Standards established by the NCPQ lend themselves to a wide range of uses, some of which are outlined below.

For **curriculum development teams and instructors**, the Standards can:

- provide a basis for curriculum design and development.
- assist in analyzing and evaluating current curriculum and other instructional resources.
- provide a component to curriculum planning that assesses student outcomes relative to teaching methodologies and student assessment techniques.

**Administrators** may use these Standards to:

- conduct curriculum reviews.
- adapt or adopt curriculum.
- evaluate instructional resources and support.
- establish local curriculum standards and policies.
- evaluate programs.

For **local governing boards' education-business partnerships**, the Standards can:

- form an information base to evaluate curriculum content and instructional design.
- provide an evaluative framework for curriculum adaptation or adoption.
- form a basis for curriculum planning issues by creating an awareness of national standards and goals.
- benchmark local curriculum to industry skill standards and education goals.

**Teacher educators** will find the Standards useful to:

- provide students with guidelines for analyzing and evaluating curriculum and other instructional resources.
- design courses and workshops on curriculum.
- provide students with essentials elements to plan programs, develop courses, and create awareness of national standards and goals.

For **State Departments of Education personnel**, the Standards can:

- provide a guide for curriculum development.
- act as a tool to appraise the status of curriculum and other instructional resources used within the state.
- assist in appraising instructional materials under consideration for state adaptation/adoption action.

Benefits for **students** include:

- readily available details of program outcomes and skills required.
- accurate information regarding instructional activities and assessment standards.

# NCPQ STANDARDS AND INDICATORS

## What Constitutes a Meaningful Curriculum Evaluation?

Developed to help practitioners, curriculum developers, and teacher educators enhance the quality of school-to-work curriculum, the NCPQ Standards and Indicators provide an essential tool for evaluating curriculum materials for content, instructional strategies, student assessment, and equity/diversity considerations. A comprehensive curriculum evaluation provides practitioners with a host of information: it guides educators who are considering a curriculum for adoption, it assists curriculum developers in making specific revisions and enhancements, and it guides future curriculum development efforts designed to expand or supplement quality curriculum content. A comprehensive evaluation assists not only the curriculum developer, but also the curriculum implementor--whether classroom instructor, administrator, or curriculum committee--in making informed choices about curriculum materials to guide the teaching-learning process.

## The NCPQ Standards--What Might They Look Like in Curriculum Materials?

The NCPQ Standards and Indicators encourage curriculum practitioners to evaluate materials for content, instructional strategies, assessment, and equity and diversity considerations. The Standards are broad, qualitative ideals stating what is valued in curriculum materials. The Indicators represent tangible attributes that support the Standards. The Standards are listed in a statement format, while the Indicators appear in a question format. *For a complete listing of the Standards and Indicators, turn to Appendix C.*

For example, within the Content Standard, one Indicator asks, "To what extent has the content incorporated appropriately validated skills, tasks, and/or competencies?" Although this Indicator statement evokes a direct question, it leaves the potential answer of "how" to be determined by curriculum practitioners. In this section, the NCPQ offers tangible examples of "how" to implement the Standards and their associated Indicators. Note, however, that these examples are only suggestions or existing models. *They are by no means the exclusive recommendations or solutions.* In determining "how," curriculum practitioners must consider a spectrum of issues facing curriculum and education. Some of these issues are unique to each educational situation, while others are more common and applicable to most learning environments. Either way, the examples offered here are a basic gauge by which to measure a particular Indicator's presence in a curriculum.

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# CONTENT STANDARD

*School-to-Work education curricula must focus on the integration of academic foundations with career development, life skills, and occupational competencies.*

***Indicator:***

**To what extent has the content incorporated appropriately validated skills, tasks, and/or competencies?**

National studies (e.g., *America 2000: An Educational Strategy* [USDE, 1991]; *Workplace Basics: The Skills Employers Want* [Carnevale, Gainer, & Meltzer, 1988]; *America and the New Economy* [Carnevale, 1991]; *What Work Requires of Schools: A SCANS Report for America 2000* [SCANS, 1991]) have identified skills that are essential for successful workforce training and development and for the nation's economic development. To ensure that curriculum content addresses the issues raised in these national studies, the curriculum should address the following concerns:

- **Has the content been validated by industry?** Does documentation indicate a business/technical advisory committee was used to validate the curriculum content? For example, the Associated General Contractors of America (AGC) carpentry curriculum content and associated skills were cooperatively validated by two committees consisting of educators, curriculum developers, carpenters, and construction professionals.
- **What is the copyright/publication date of the curriculum content?** What was the last revision date and who conducted the revision?
- **Has the content been certified by licensing and certifying agencies when appropriate?** If the material covers an apprenticeship or a specific occupation requiring licensing or certification, was an appropriate licensing agency involved? For example, the Electronics Industry Association was involved in developing the *Electronics Technician Skills for Today and Tomorrow* skill standards publication.
- **Has the content been field tested?** Do commentary, trial results, and/or data indicate that the content has been field tested prior to final publication/development? Has it been used in the classroom?
- **Are all aspects of the industry presented?** As defined by the School-To-Work-Opportunities Act of 1994, "all aspects of an industry" means all aspects related to the particular industry (or industry sector) which a student is preparing to enter, including planning, management, finances, technical and production skills, underlying principles of technology, labor and community issues, health and safety issues, and environmental issues.
- **Is the academic content consistent with national standards?** If academic content is incorporated in the material, it should be consistent with the appropriate national standards. For example, material encompassing math should be consistent with the recommendations of the National Council of Teachers of Mathematics; science-based materials should be consistent with the recommendations of the National Science Foundation; and materials involving Social Studies should be consistent with the standards recommended by the National Council for Social Studies.

## *Indicator:*

**To what extent do the skills and competencies presented in the product correspond to workforce competencies and foundational skills indicated in the SCANS Report?**

The Secretary's Commission on Achieving Necessary Skills (SCANS) report's skills and competencies, published and released in June 1991, were deemed necessary requirements of high school graduates or of persons entering the workforce--especially those expecting to become successful members of the workforce. The SCANS Foundational Skills and Competencies follow:

The SCANS Foundational Skills:

- **Basic Skills:** reading, writing, arithmetic/mathematics, listening, and speaking
- **Thinking Skills:** creative thinking, decision making, problem solving, seeing through the mind's eye, knowing how to learn, and reasoning

- **Personal Qualities:** skills concerning responsibility, self-esteem, sociability, self-management, and integrity/honesty

The SCANS Competencies:

- **Resources:** time, money, materials and facilities, and human resources
- **Interpersonal:** team member participation, teaching others, exercising leadership, negotiating, and working with diversity
- **Information:** acquiring and evaluating information, organizing and maintaining information, interpreting and communicating information, and using computers to process information
- **Systems:** understanding systems (e.g., complex interrelationships), monitoring and correcting performance, and improving and designing systems
- **Technology:** selecting appropriate technology for a task, applying technology, and maintaining and troubleshooting technology

The following matrix from *Focus on Your Future: A Success Skills Planning Curriculum for Teens* (Hendon, 1994) exemplifies the relationship of a curriculum's competencies to the SCANS Foundational Skills.

## *Indicator:*

**To what extent does the product include documentation of validated occupational, academic, career, and life skills and competencies to show where and how those skills and competencies are being incorporated?**

Some of the curriculum materials reviewed by the NCPQ have documented skills using a simple matrix configuration or table such as the example below. Others have been more detailed, and have documented the primary task or competency with supporting subskills, along with the occupational cluster and academic skill group the task is related to, and a description of the task. The following matrix from *Introduction to International Trade* (Crummett & Crummett, 1994) illustrates one type of design.

Related Academic and Workplace Skills List
**Unit 5: International Marketing**

| Task | Skill Group | Subskill Description |
|---|---|---|
| Evaluate an international marketing plan | Foundation skills | Reading<br>Comprehending written information, and analyzing and applying what has been read to a specific task. |
| | | Writing<br>Communicating a thought or idea in a written form in a clear, concise manner. |
| | Learning skills | Learning to learn |

Developing the ability to apply knowledge to other situations.

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## *Indicator:*

**To what extent does the product identify performance levels for skills and competencies?**

Performance levels for skills and competencies expected of students can be designated in the curricula in the following ways:

- Identified performance levels that include quantified figures or percentages
- Competency or skill statements that allow for a "yes" or "no" response
- Performance descriptions (of what the student will be able to do) that can be reflected in a rating scale

The following three examples--*Food Science and Technology* (Martin, 1994)*, Fundamentals of Carpentry* (Hendrix, 1985)*,* and *Focus on your Future: A Success Skills Planning Curriculum for Teens* (Hendon, 1994)--illustrate appropriate ways to state performance levels for skills and competencies:

Example 1: Introduction to Food Sciences.

Unit 1 Outcomes: To receive a B for this unit, the student will complete 80% of each of the following outcomes:

**Outcome 1: The student will be able to:**

1. Define the study of food science and describe the main goal of food scientists.
2. Explain the interrelationship of food science and nutrition.
3. Identify and use laboratory equipment safely.
4. Write accurate and complete reports on food science experiments (Food Science Laboratory Report Form).
5. Know the requirements for working safely in a laboratory.

Example 3: Competency 7.0: Locate, evaluate, and interpret career information. Total time:
9 hours

- Indicator 7.01: Identify and utilize career information resources (e.g., computerized career information systems, print and media materials, mentors).
- Indicator 7.02: Describe information related to self-assessment, career planning, occupations, prospective employers, organizational structures, and employer expectations.
- Indicator 7.03: Describe the uses and limitations of occupational outlook information.
- Indicator 7.04: Identify the diverse job opportunities available to an individual with a given set of occupational skills.
- Indicator 7.05: Identify opportunities available through self-employment.
- Indicator 7.06: Identify factors that contribute to misinformation about occupations.
- Indicator 7.07: Describe information about specific employers and hiring practices.

## *Indicator:*

**To what extent is the content current?**

**To what extent is the content accurate?**

Locate the development date of the material. Does the content meet today's standards or requirements for the particular topic or subject area? A hallmark of the material's accuracy and currency would be the documentation of a content or skills validation process used by the material developer. Did incumbent workers or workplace professionals participate in developing the curriculum?

## *Indicator:*

**To what extent is the content sequenced from basic to more complex concepts?**

**Is the content designed using coherent clusters or themes?**

**To what extent are the content objectives and learner objectives aligned?**

The learning objectives, outcomes, or concepts should be designed with a meaningful order or approach in mind. However, according to Boyle (1981), "[A] logical order in the sense of the discipline may not be logical from the standpoint of the learner" (p. 52). Bearing this concept in mind, examine the material and note whether the following characteristics are present as they relate to sequenced concepts:

- When pieced together, do the sequenced or clustered concepts reflect the "big picture" of the content area?
- Is the sequenced or clustered content (i.e., embedded concepts) going to be of specific value to the learner (Boyle, 1981)? Is this value stated in the material?
- Is the content (and its concepts) attainable and relevant to the learner in the programming/instructional situation in which it is being implemented?

Boyle, P.G. (1981). *Planning better programs*. New York, NY: McGraw-Hill, Inc.

## *Indicator:*

**To what extent is the content presented in an interesting and appealing manner geared toward diverse student audiences?**

In 1987, John Kellor developed the ARCS (Attention, Relevance, Confidence, and Satisfaction) Model, which focuses on "influencing learners' motivation to learn and for solving problems with learning motivation" (Smith & Ragan, 1993, p. 310). The model can be a useful tool to consider when examining instructional materials and related instructional strategies for opportunities to heighten student interest and relevancy. The ARCS Model includes the following components:

***Attention Strategies*** (included in the curriculum material and supporting instruction) draw the learners' attention to the material and "frequently involve very specific techniques of content presentation or treatment" (Smith & Ragan, 1993, p. 310). Examples of these strategies include:

- Incongruity and conflict: The instructor introduces issues and topics that apparently counter student experience,

playing "devil's advocate."
- Concreteness: The instructor acts on opportunities in the material (or instruction) for visual and verbal presentations, as well as applied practice.
- Variability: The material encourages diversity in instructional format, medium of instruction, layout and design of the instructional material, and learner interaction patterns (e.g., student with instructor, and student with student).
- Humor.
- Inquiry: The material includes problem-solving activities, "providing opportunities for learners to select topics, projects, and assignments" (p. 311).
- Participation: Learning experience encompasses activities such as worksite shadowing/experiences, role playing, and/or simulations. "Attention strategies should direct the learners' attention to the task" (p. 311).

***Relevance Strategies*** included in the curriculum material and supporting instruction influence how the content and supporting learning tasks/outcomes/objectives are presented to the student. These strategies could include:

- Experience: The content should build upon the learners' present skills and backgrounds. The analogies drawn in the material should help the students recall personal experiences. The content should be adaptable to student interests.
- Present worth: The content should have an immediate purpose.
- Future usefulness: The instructional goals should be linked to the learners' goals.
- Need matching: The content should include activities that allow learners to "exercise responsibility, authority, and influence" (p. 311).

***Confidence Strategies*** focus on particular "learner performance" included within instructional material, making the content more interesting and appealing to the student. Examples of confidence strategies are "incorporation of learning goals into the instructional materials; learning activities sequenced in order of increasing difficulty that provide a continual challenge; informing students of success given different levels or choices of effort; encouraging students to develop an internal locus of control with regard to learning activities; providing practice skill sets and example techniques" (pp. 311-312).

***Satisfaction Strategies*** that can influence interest and motivation include the following:

- Natural consequences
- Unexpected rewards
- Positive outcomes
- Avoiding negative influences
- Scheduling

The instructional material can better serve diverse student audiences if aspects of these strategies appear in the content.

In addition to the examples included in the ARCS Model, material should actively represent learners of both sexes, and of various ethnic and cultural backgrounds. The content should be free of any bias.

Smith, P.L. and Ragan, T.J. (1993). *Instructional design*. New York, NY: Macmillion.

## *Indicator:*

**To what extent are career development, career awareness, and mobility incorporated throughout the instructional content?**

When career values are reflected in curriculum, students see the connection between learning and real life. These integrated concepts allow students to adapt to changing work requirements. The following example illustrates how these concepts may appear within an instructional resource.

The CIMC's (Curriculum and Instructional Materials Center) *Forestry* curriculum guide (Oklahoma Department of Vocational and Technical Education, 1991) exemplifies an integrated career education unit within a specific occupational curriculum. In addition to career references and resources in each unit, the curriculum guide contains an entire unit entitled "Investigate Forestry Career Opportunities." The unit objectives (see below) and related supplements (e.g., "What You Need To Succeed [in forestry]," "Meet the People Who Work in Forestry") detail the following components:

- Terms Associated with Forestry Careers
- Forestry Profession Facts
- Forestry-Related Areas of Study
- Educational Requirements for Nonprofessional and Professional Forestry Positions
- Identifying Personal Requirements for a Career in Forestry
- Advantages and Disadvantages of a Forestry Career
- Organizations that Employ Foresters
- The Communication Skills Required in Forestry

The unit itself depicts women in nontraditional occupational roles, uses culturally inclusive language, and offers the student a breadth of forestry-related career knowledge.

## *Indicator:*

**To what extent does the curriculum product address the following concepts:**

- Are vocational and academic skills integrated?
- Are employability and life skills (e.g., getting to work on time) included?
- Is inclusive language used?
- Are diversity and commonality among people recognized?
- Are contributions from people of diverse backgrounds recoginezed?
- Is transferability of learned skills/knowledge emphasized?

The following example is excerpted from curriculum material developed by a high school in Brooklyn, New York. The material is designed for the school's integrated Health Occupations program, and addresses in part the diverse ethnicity of its students. A unit outline from that curriculum (shown below) gives students an opportunity to experience the integration of vocational and academic skills, an emphasis on life skills, and an expansion of knowledge regarding the diversity and commonalities among people and cultures.

**The Cycle of Life: Activities of Daily Living/Life Skills**

**Core Focus:** How do different cultures deal with death and dying? Students will:

- Discuss death and cultural differences in acceptance.
- Identify strategies used to prepare for approaching death.
- Describe ways that one person's death can benefit other members of society (e.g., living wills, organ donations).

**Global Studies:** How do people from India deal with death? Students will

- nvestigate how death is accepted in Indian cultures.

**English:** How might we reconcile the approaching death of an elderly loved one? Students will

- Read and discuss "Sixteen" by Jessamyn West. This short story is about a teenager's acceptance of a grandparent's approaching death.

**Math:** How does the death rate increase as age increases? Students will

- Use ratios to compare statistical information on death rates in different cultures, correlating age with other health-related factors.

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# INSTRUCTIONAL STANDARD

*School-to-work curricula, through active and applied learning experiences in school, community, and work-based settings, enable students to acquire problem-solving, communication, and reasoning strategies.*

### *Indicator:*

**To what extent do the instructional strategies include active and meaningful learning experiences that correspond to stated student outcomes?**

Effective instruction engages learners in the process of learning rather than merely transmitting information for them to receive. Relevant experiences promote learners' active involvement and bring the classroom closer to--or into--their future work environments. Moreover, active learning experiences must be meaningful. They should relate to the "real world" and, most importantly, the learning experience should bring about the desired student knowledge and skills. Do the instructional strategies in the material reflect real-world problems, issues, and experiences? Do they align with what the student is expected to know and be able to do? The following example from *Analyze and Apply: A Guide To Connect Learning to Performance* (Stanley, 1994) illustrates two active and meaningful learning experiences directly related to a stated outcome:

**Subunit Objectives**: After you complete this subunit, you will be able to:

1. Investigate the sources and uses of water in your community.
2. Categorize water uses based on the properties of water.
3. Explain how water is used in a home heating systerm, a power plant condenser, an evaporating cooler, and a car radiator.

4. Compare three types of mixtures involving water and other substances.
5. Explain why water represents such an important habitat for organisms.
6. Devise a rule to predict whether a material will float in water. (See corresponding activities below.)
7. Investigate the structure of water through the chemical formulas for water.

**Objective 6 Corresponding Learning Activity A:**

- Find the density of a block lf marble measuring 3cm x 4cm x 7cm and weighing 450 grams. Find the volume first by multiplying the dimensions. Then divide the mass by the volume. How much greater is the density of the marble than the density of the water?
- Find the density of evaporated milk if 384 cm^3 weighs 411 grams. How does its density compare with that of water?
- Determine the procedures you would use to find the density of the following materials. Compare your procedures with those suggested by others in the class and decide as a class which one might work the best.
  -A bar of soap
  -Whole milk
  -Ice

**Objective 6 Corresponding Learning Activity B**

- Divide the class into four or five groups.
- In each group, develop a guideline that can be used to predict what materials will float in water and what materials will sink in water. The guideline may be stated in words, shown in a diagram , or expressed as a formula.
- Compare the guidelines developed by each group. Decide what kind of knowledge or information each guideline is based. Decide which guidelines you think are true and which expressions are clearest.

## *Indicator:*

**To what extent do the instructional strategies include teaching techniques that support/reflect the enhancement of the SCANS thinking skills: creative thinking, decision making, problem solving, seeing things in the mind's eye (e.g., organizing and processing symbols, pictures, graphs and other information), knowing how to learn, and reasoning?**

Intellectual processes are critical to meeting the challenges of advancing technology and of keeping pace with the rapid changes occurring in the workplace. Thinking skill development is critical for workforce participation. Within the curriculum material, are the instructional strategies designed to develop students' problem-solving, decision-making, knowledge production, and analytical thinking skills? The following example, from *Developing Entrepreneurial Attitudes* (MAVCC, 1995), illustrates an instructional strategy that emphasizes the SCANS thinking skills:

**Learning Task: Use CAD to design and develop a package.**

You are the president and owner of an independent specialty packaging company. A firm that is developing new hot and cold packs to be marketed to the sports trade has hired you to design the most cost-effective package for the product. You're also asked to ensure that the package has a minimal environmental impact. You have been given permission to consult with the chemistry department and the marketing department of the firm.

- Determine the relationship of surface area to volume and develop the most cost-effective package.
- Consult the marketing department for their suggestions and design requirements.
- Consider various packaging materials and compare the costs.
- Consider the environmental impact of possible materials and be able to justify your final decision.
- Make a scale drawing of your package.
- Make a model of your package.

## *Indicator:*

**To what extent can the suggested instructional strategies be adapted to different learning styles?**

Quality curricula engages students with a variety of learning activities adaptable to students' different learning styles, and encourages students to think and create in ways unique to their own preferences and experiences. Factors to consider when reviewing curricula include "Can the instructional strategies in the material be adapted to alternative forms such as group, team, or cooperative educational activities; class presentations; or data collecting through surveys of community members?" "Can the strategies in the material be adapted, if necessary, to meet the learning levels of all students?" For example, the following learning task, taken from *All Aspects of the Industry: Supplementary Instructional Modules* (Instructional Materials Laboratory, 1994), could be adapted in a number of ways: (1) it could become a team or group activity; (2) it could involve a panel discussion or presentations on findings; or (3) it could be expanded to include interviews of paint contractors.

**Student Activities** (from *All Aspects of the Industry*. Instructional Materials Laboratory. University of Missouri-Columbia)

1. Describe briefly the process of estimating and bidding.
2. Name a factor that can alter the final cost of a project after the estimating and bidding process is completed.
3. Envision that you own a painting company. You know that you must be the low bidder to get the contract to paint the outside of the Columbia office building. Would your bid be the same in the summer as in the winter? Why?

## *Indicator:*

**To what extent do the instructional strategies (i.e., activities and projects) reflect the diversity of today's workforce?**

Do the instructional projects and activities in the material reflect women and men in occupations not traditional to their gender? Do the projects and activities create the impression that persons of color work in all types of occupations? Are aspects of different cultures integrated into the projects and activities encouraging greater understanding of diversity in the workplace? Will the projects or activities enhance and reinforce the concept of an inclusive workplace?

An activity from *All Aspects of the Industry: Supplementary Instructional Modules* (Instructional Materials Laboratory, 1994) provides an illustration of diversity issues within the workplace:

**Student Activity:** Contact a company representative in the area in which you have an interest and ask for examples of cultural diversity affecting the company.

The *Applications in Biology and Chemistry* curriculum developed by CORD (1991) incorporates job profiles into the curriculum content. The following case illustrates the inclusion of a woman in a nontraditional technical position:

**Job Profile: Hydrogeologist**

Christa P. is a hydrogeologist who works for a civil engineering firm. The firm does environmental studies for businesses and government agencies.

"A hydrogeologist has to incorporate a basic understanding of groundwater flow with a knowledge of geology and chemistry," says Christa. "Much of my work involves helping companies comply with environmental regulations. For example, we might be called out to evaluate groundwater if a company's underground storage tanks were suspected of leakage. Or we might be hired to routinely monitor the groundwater in the tank storage area. When asked what steps she would take in such a situation, Christa explains, "We install monitoring wells--these are small-diameter pipes that are placed into the ground. Groundwater comes up into the pipe, and we're able to sample it. We also do soil borings and test soil for contamination. If we find contamination, we help the company make a plan to remedy the situation. But prevention is always better than remediation."

## *Indicator:*

**To what extent do the instructional strategies incorporate team or small group projects?**

Including team or small-group projects and cooperative learning activities within an instructional material lends a real-life touch to classroom experience and fosters greater learning for many students who learn best in that environment. Do some of the learning tasks in the material build around this concept? The following example from *Guide for Integrated and Applied Curriculum, Instruction, and Assessment* (Wisconsin Department of Public Instruction, 1994) illustrates the concept of team or small-group projects.

**Learning Task:** Cut School Budget

Your task force of three to five people has been charged by the school board to suggest ways to cut the total school budget by 20%. The school board members will depend on your work to defend their position regarding all cuts. Your task entails the following:

- Identify a process you would use to prioritize the cuts.
- Document how these changes would affect program needs, curriculum, learning atmosphere, user fees, and extracurricular activities.
- Identify the effects of this cut on a family (two school-aged children) that pays property tax, of which $500 goes toward the school budget.
- Work effectively in a group.
- Create a quality product, process, or performance that will enable the school board to make appropriate budget cuts and to defend those cuts to the general public.
- Identify a compelling personal interest and pursue it by creating strategies and policy to effect change in one's life and in the great society.

*Indicator:* **To what extent do the instructional strategies encourage students to interact with each other, instructors, and the community? For example, do they encourage students' articulation and reflection on a**

**particular learning experience?**

Interactions between and among students, instructors, and community members broaden and enhance students' learning experiences. Interactions also strengthen students' abilities to become competent learners in the changing workplace. Interaction strategies can take the form of teaching experiences for students, as exemplified in the *Food Science: An Interdisciplinary Approach to Curriculum Design* curriculum by Interdisciplinary Resources, Inc. (1995). In this example, students articulate and reflect upon their own learning with peers, with instructors, and with students several years younger:

**Learning Activity: Mentoring in the Elementary or Middle School**

In this learning activity, you will share your knowledge in the area of Food Science with elementary/middle school students. You may choose to work with one partner on this mentorship. Your presentation must have instructor approval from the beginning. School field trip procedures will be followed for this activity.

**Procedure:**

1. At a time that is convenient to the program, arrange a conference outside of class with the Food Science instructor.
2. Communicate with the instructor of the school you'll be visiting.
3. After the conference, complete an outline of the proposed mentor project. The outline must meet instructor approval, and should include the following:
    - Purpose of the project
    - Objectives and goals
    - Activities to be completed by the students
    - Explanation of any displays, visual aids, and handouts
    - Outline of verbal presentation
    - Outline of evaluation
4. Have a practice session with instructor and/or Food Science class.
5. Upon completion of your presentation, summarize the success of the experience, including suggestions for the future.

## *Indicator:*

**To what extent do the instructional strategies develop students' critical thinking and problem-solving skills?**

Now more than ever, intellectual processes are critical to meeting the challenges of technological advancement and keeping pace with the rapid changes occurring in the workplace. Workplace skills have shifted from concrete to abstract tasks. Do the instructional emphases in the material reflect this shift? The example that follows, taken from *Measuring What Counts: A Conceptual Guide for Mathematics Assessment* (Mathematical Sciences Education Board and the National Research Council, 1993), illustrates an instructional strategy designed to develop students' higher-order thinking skills:

**Formulate and Solve the Following Problems:**

- You have 10 items to purchase at a grocery store. Six people are waiting in the express lane (10 items or fewer),

lane 1 has one person waiting, and lane 3 has two people waiting. The other lanes are closed. What check-out line should you join?

- You are considering purchasing one of two cars, both four years old. One car costs $3,000 and gets 20 miles per gallon. The other costs $4,500 and gets 35 miles per gallon. Which car is the best buy if you plan to keep it two years?

**What Additional Information Do You Need To Answer These Questions?**

One aspect of formulating problems is identifying whether additional information is needed. Neither of the problems above provides all the information needed to make a decision. Students need to identify the missing information and the likely estimates for the missing quantities. In question *a*, the number of items each person has and the speed of the checkers are considerations. In problem *b*, the number of miles traveled each year, the price of gasoline, and cash available are considerations. If money has to be borrowed to purchase the more expensive car, the loan can make a difference.

These problems are appropriate for individual or small-group work. Notes can be kept on the variety of questions generated and what additional information is assumed in class, and instructors can observe the willingness of students to engage themselves in finding the necessary information. Calculators are important for question *b*..

(From *Measuring What Counts: A Conceptual Guide for Mathematics Assessment.* Mathematical Science Educational Board, National Research Council, 1993)

## *Indicator:*

**To what extent do the instructional strategies develop students' skills of writing, speaking, listening, and following directions?**

Effective learning projects build on a base of integrated knowledge--content--that incorporates other critical skills and competencies, and provides opportunities for students to develop writing, speaking, and listening skills. Does the material provide opportunities for students to engage and integrate these critical skills? The following instructional strategy, taken from *Developing Entrepreneurial Attitudes* (MAVCC, 1995), illustrates the development of students' critical skills of writing, speaking, listening, and following directions:

**Assignment Sheet 5**

Many businesspeople might define "business sense" differently, and their definitions are equally valid. All will argue, however, that business sense is essential to an entrepreneur's success, and each businessperson's definition of business sense should give you additional insight into entrepreneurial thinking skills. The following exercise will enable you to discuss business sense with a successful entrepreneur and to consider its relationship to creativity in the business world.

**Reading Assignment:** Read the information presented in the following component.

*Objectives:* Identify major aspects of entrepreneurial thinking and their definitions. Identify the characteristics of a person with business sense, and define those characteristics.

*Activity Checklist:* Cross off each activity below as you complete it.

1. Your instructor will invite a group of local entrepreneurs to your class. Your class will be divided into groups, and each group will be assigned one entrepreneur to interview, using the interview outline on the next page. Each student in the group should take notes during the interview process.
2. Using the notes each person has taken during the interview, your group will work together to write an essay that describes the business sense of the entrepreneur your group interviewed.
3. Turn in your essay to your instructor for evaluation.
4. Your instructor will return your essay with suggestions for improvement. Make the improvements your instructor suggests, and return your essay to your instructor for final evaluation.
5. Your group will then make a class presentation on the information included in your group essay.

## *Indicator:*

**To what extent do the instructional strategies provide the students with real-world experiences (both in and out of the classroom) which reinforce academic and technological applications?**

"Real world" learning projects integrate academic and school-to-work or occupational skills to reflect authentic life and work situations, and they afford opportunities for students to witness the diversity (specifically regarding gender, race, ethnicity, and disability) of today's workforce. Does the material include authentic learning projects in which students can apply knowledge and skills to complex real-world problems? The two following instructional strategies are designed to incorporate real-world experiences to reinforce the desired academic and technological learning:

**Assignment Sheet 2:** (from *The Entrepreneurial Workplace* [Wood, 1995])

*Activity Checklist:* Cross off each activity below as you complete it.

1. Your instructor will divide your class into groups, with at least three students to a group. Your group should study the information provided in the following scenario.
2. Design a benefits package for ENTY's employees. Prepare a written report describing your benefits package and justifying your group's selections. Provide cost figures for each benefit your group selects.
3. Turn your benefits package report in to your instructor for evaluation.
4. Your instructor will return your report with suggestions for improvement. Make the improvements your instructor suggests, and then return your report to your instructor for final evaluation.

**ENTY Scenario:** Wanda Marker hated the way her car and her lawn furniture rusted. Using her past experience as a chemist, Wanda developed a new paint product that prevented metal from rusting. She then borrowed money to modify second-hand equipment, set up a production line in her barn, and ENTY was born.

- ENTY has 75 employees.
- Fifty-five of the employees are between the ages of 25 and 35 and have young children.
- Four employees have the responsibility of caring for their parents.
- While ENTY has the latest safety devices, 70 of the company's employees are considered to be in a high-risk group for disabling injuries.
- The plant operates three eight-hour shifts.
- Twenty-five employees have expressed a desire for flexible work hours.

Wanda wants to meet her employees' needs, but benefits can only be 8% of gross income ($6,000,000). If benefits were

at a higher percentage, the additional cost would necessitate a boost in product price, a move Wanda feels would result in a loss of market share.

Wanda has asked a team of her employees to help her decide which benefits should be included in the employee benefit package. She has assigned each benefit a cost:

| Description | Cost (in thousands) |
|---|---|
| Current medical benefits, without dental or eye care | $250 |
| Dental/eye care coverage | $30 |
| Day care for children | $100 |
| Day care for parents | $50 |
| Disability insurance | $50 |
| Flextime | $100 |
| Life insurance | $30 |

**Daily Nutrition Intake Lab** (from *Food Science: An Interdisciplinary Approach to Curriculum Design* by Interdisciplinary Resources, Inc.)

**Introduction:** In this lab activity, students will keep track of their daily nutrition intake and then use this information to analyze the types of nutrients being consumed.

Prior to using the nutrition program, the student must record all foods, beverages, and so on, consumed during a 24-hour period. After completing the list, students should list each item in the appropriate food group, listed below.

Here are the available food groups: Baby Foods, Pastries & Candy, Fast Foods, Dietetic Foods & Supplements, Fats-Sugars-Condiments, Beverages, Cereals & Grains, Fruits, Ingredients & Spices, Non-Meat Entrees, Breads & Crackers, Cookies & Snacks, Juices & Drinks, Legumes, Meat-Fish-Poultry, Cakes, Dairy, Soup & Sauces, Vegetables

**Before You Use the Computer, You Need To Have the Following:**

1. A list of foods eaten in the last 24 hours.
2. Next to each food on the list, an abbreviation noting what food group it will be found in.

Once the list has been completed, the student must start up the MacDiet program on the computer.

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# ASSESSMENT STANDARD

*Assessments within school-to-work curricula must be student-focused in the measurement of attitudes, knowledge, and*

*skills, as well as their application to problem solving within the classroom and workplace learning environment.*

## *Indicator:*

**To what extent are student teams, as well as the individual student, assessed?**

Learning to work as a team member or cooperatively is a real-life skill for students, one which leads to an understanding of their future work environments. Therefore, it is imperative that students learn to share in problem-solving and learning task responsibilities, as well as gain an awareness of their performance within that context. The following assessment strategies, all from *Guide for Integrated and Applied Curriculum, Instruction, and Assessment* (Wisconsin Department of Public Instruction, 1994), illustrate the concept of assessing both individual work and effort as a team member.

**Content-Related Activity Questions** (e.g., individual assessment)

1. Do you think humans will ever be extinct?
2. Do you think humans will change enough to produce new species?
3. What factors might cause this change?

**Alternative Assessment Approach to the Same Activity Questions**

Students might approach (and the instructor may similarly assess) this learning activity by first problem solving in small groups and then trying to form a consensus in a class discussion.

**Related Formal Assessment Questions** (found in the chapter test bank questions)

1. How does environmental change encourage the formation of new species?
2. How does environmental change encourage the extinction of an existing animal species?

### Assessment for Collaborative Problem Solving
### Using the SCANS Competencies

| | High Low |
|---|---|
| **1. Identifies, organizes, plans, and allocate resources.** | |
| • *Time:* selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules. | Self 5 4 3 2 1 |
| • *Money:* Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives. | |
| • *Material and facilities:* Acquires, stores, allocates, and uses materials or space efficiently. | Group 5 4 3 2 1 |
| • *Human Resources:* Assesses skills and distributes work accordingly, evaluates performance, and | |

| | |
|---|---|
| provides feedback. | **(Circle One)** |
| **2. Works with others.** | |
| • *Participates as Member of a Team:* Contributes to group effort. | |
| • *Teaches Others New Skills* | Self 5 4 3 2 1 |
| • *Serves Clients/Customers:* Works to satisfy customers' expectations. | |
| • *Exercises Leadership:* Communicates ideas to justify position, persuades and convinces others, reasonably challenges existing policies and procedures. | Group 5 4 3 2 1 |
| • *Negotiates:* Works toward agreements involving exchange of resources, resolves divergent interests. | **(Circle One)** |
| • *Works with Diversity:* Works well with men and women from diverse backgrounds. | |
| **3. Acquires and uses information.** | |
| • *Acquires and Evaluates Information.* | Self 5 4 3 2 1 |
| • *Organizes and Maintains Information.* | |
| • *Interprets and Communicates Information.* | Group 5 4 3 2 1 |
| • *Uses Computers to Process Information.* | **(Circle One)** |
| **4. Understands complex inter-relationships.** | |
| • *Understands Systems:* Knows how social, organizational, and technological systems work, and operates effectively with them. | Self 5 4 3 2 1 |
| • *Monitors and Corrects Performance:* Distinquishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions. | Group 5 4 3 2 1 |
| • *Improves or Designs Systems:* Suggests modifications to existing systems and develops new or | |

| | |
|---|---|
| alternative systems to improve performance. | **(Circle One)** |
| **5. Works with a variety of technologies.** | |
| • *Selects Technology:* Chooses procedures, tools, or equipment including computers and related technologies. | Self 5 4 3 2 1 |
| • *Applies Technology:* Chooses procedures, tools, or equipment including computers and related technologies. | Group 5 4 3 2 1 |
| • *Maintains and Troubleshoots Equipment:* Prevents, identifies, or solves problems with equipment, including computers and other technologies. | **(Circle One)** |

**Assessment Form: Work Effectively in Groups**

The members of the group will individually assess the contribution of each group member to the group. The instructor will average the scores for the final score.

Group member being assessed: _____

Assessed by: _____

Rate each component 1-6:

1. The group member did not contribute in this area.
2. There was minimal contribution but not at a level that was expected, nor did it contribute to the overall effectiveness of the group.
3. There was some contribution, but the effort and quality of the contribution did not benefit the group effort.
4. The contribution was in some way beneficial, but not outstanding.
5. The contribution was very beneficial and the effort and quality of the contribution was a substantial benefit to the group effort.
6. The contribution in this area was outstanding and was, in fact, the critical factor in the success of this component.

[The group member] Demonstrated ability to work productively by:

____ Managing time well

____ Demonstrating dependability in completing work

____ Demonstrating accuracy in completing work

____ Demonstrating initiative in completing work

____ Persevering through difficult and complex problems

____ Applying logical reasoning in solving problems or dealing with information

Demonstrated ability to communicate clearly by . . .

____ Writing and speaking so others can understand

____ Asking questions when appropriate

____ Giving clear instruction to others

____ Checking for accuracy

____ Demonstrating effective listening

____ Using acceptable language

____ Providing necessary detail

____ Describing problems accurately

____ Interpreting the impact of nonverbal communication

Demonstrated the ability to work cooperatively by . . .

____ Completing tasks

____ Solving problems

____ Resolving conflicts objectively

____ Giving and accepting constructive criticism

____ Showing tolerance for individual differences

____ Providing information

____ Offering support

____ Demonstrating respect for others through work and action

Demonstrated the ability to think critically and creatively by . . .

____ Setting goals and working to attain them

____ Analyzing, synthesizing, and evaluating information

____ Recognizing other points of view

____ Making decisions based on careful analysis

____ Demonstrating open-mindedness

____ Recognizing the difference between facts and opinions

### *Indicator:*

**To what extent do(es) assessment tool(s) measure the attitude, knowledge, and/or skill presented in the material?**

When reviewing assessment tools, the reviewer should ascertain whether the assessment tools act as appropriate information or learning "targets." In other words, does the assessment instrument seem to target or measure what it claims to measure (i.e., test validity)? Is the assessment tool objective and consistent with the knowledge or skill area it is representing (i.e., reliability)? Dr. Arthur Costa (1995) of California State University-Sacramento has developed a criteria guide for evaluating content units and assessments. Although Costa's guide is designed for science, the main idea for each criteria statement can be applied to any educational content assessment, and certainly to assessments included in school-to-work curricula.

1. Are there activities/assessments that require students to think about and analyze situations (e.g., assessing metacognition)?
2. Does the unit feature activities/assessments that call for more than one step in arriving at a solution (e.g., assessing metacognition/flexibility)?
3. Are activities/assessments with more than one correct solution included (e.g., empathy/flexibility)?
4. Are there opportunities for students to use their own data and create their own activities/assessments (e.g., creativity/problem posing)?
5. Are students encouraged (in the material/assessment tool) to use a variety of approaches to solve a problem (e.g., flexibility)?
6. Are there assessment exercises that encourage students to estimate their answers and check their results (e.g., accuracy)?
7. Is the [content] information given in the activity/assessment and elicited in the answer accurate (e.g., using past knowledge)?
8. Is there opportunity for assessing skills through exercises that call for hands-on or applied activities?
9. Does the assessment or assessment strategy include activities that can be carried out over a period of time (e.g., persistence)?
10. Are there assessment activities with erroneous information that require students to find the errors or critique the way the problem is designed (e.g., problem posing, checking for accuracy)?
11. Are there opportunities for students to design their own assessment questions, problems, or designs?
12. Are there assessment activities that encourage students to work both individually and with other students in finding solutions (e.g., empathy and cooperation)?

### *Indicator:*

**To what extent does the assessment process . . .**

Provide instructional feedback?

Provide students with information for skill improvement?

Act as a diagnostic tool?

Allow conversion into a grading system if necessary?

Include opportunities for multiple testing situations?

When applied to student assessment, the concepts of skill improvement, instructional feedback, and diagnostic tools reinforce the need for assessments that provide information necessary to strengthening student learning throughout a curriculum. In a quality curriculum, both formative and summative evaluation methods are necessary, and they provide for multiple testing situations. One also needs to consider whether the assessments can be converted to a grading system if necessary.

## *Indicator:*

**To what extent are performance and portfolio assessments used to measure student knowledge and skills (e.g., performance of tasks, process, and resulting products)?**

The next example, from *Arts Propel: A Handbook for Music* (Davidson & Myford, 1992) provides an illustration of an assessment "rubric" or framework that provides instructional feedback on a specific performance for both the instructor and the learner. The rubric clearly states what tasks and criteria students will be expected to demonstrate on the assessment. The framework can act as a diagnostic tool, lending itself to a variety of grading systems. In this case, the information is almost "built in" to the lesson itself. Assessment rubrics included in curriculum material can "promote learning by offering clear performance targets to students" (Marzano, Pickering, & McTighe, 1993, p. 29). Performance-based assessments often provide an alternative to "traditional" assessment strategies. Although traditional selected response tests (e.g., true-false, multiple choice) can be meaningfully designed, performance-based assessments (i.e., written reports, essays, and instructions; oral interviews and speeches; and constructed projects) can be included into curriculum material, and perhaps offer students a richer assessment experience.

**DOMAIN PROJECT: INDIVIDUAL LESSON**

| | | |
|---|---|---|
| Ensemble or class:<br>Grade level(s): | [voice] | Teacher socring Student Performance |
| Date: | | \| 1 \| 2 \| 3 \| |
| Teacher: | Date: | \| \| \| \| |
| Student: | Condition: | \| \| \| \| |

| | | | |
|---|---|---|---|
| Vocal Performance | | | |
| Execution Dimensions | Music Performed: | | |
| Score=NA if not applicable. | | | |
| **Pitch Production** | | | |
| 1.0-1.9 = Seldom performs pitches accurately or securely. | | | |
| 2.0-2.9 = Sometimes performs with accurate pitch but with frequent or repeated errors. | | | |
| 3.0-3.9 = Mostly accurate and secure pitches but with few isolated errors. | | | |
| 4.0-4.9 = Virtually no errors and very secure pitches. | | | |
| **Rhythm/Tempo Production** | | | |
| 1.0-1.9 = Seldom performs durations accurately or with a steady tempo. | | | |
| 2.0-2.9 = Sometimes performs durations accurately but with erratic pulse or frequent durational errors. | | | |
| 3.0-3.9 = Mostly accurate rhythm and pulse with few durational errors. | | | |
| 4.0-4.9 = Secure pulse and rhythmically accurate. | | | |
| **Diction** | | | |
| 1.0-1.9 = Seldom able to regulate vowel colors or consonants. | | | |
| 2.0-2.9 = Generally consistent vowel color with some attempt to regulate consonant sounds. | | | |
| 3.0-3.9 = Consistent vowel colors with increased control of consonants. | | | |
| 4.0-4.9 = Maintains consistent control of diction. | | | |

As another consideration when reviewing the curriculum, note the presence of assessment portfolios. Are portfolios used in conjunction with the assessment process? Does the curriculum design allow for the use of portfolios? If portfolios are included in the material, the reviewer could make a number of determinations regarding their intended use. In the book *Student-Centered Classroom Assessment*, Richard Stiggins (1994) notes the following definition and points of review concerning portfolios:

**Definition:** "A portfolio is a collection of student work assembled to demonstrate student achievement or improvement" (p. 422).

**Purpose:** The material collected can vary greatly, depending upon the intended objective(s), which ideally would be determined by both the instructor and student.

**Objectives:** "The knowledge, reasoning, skills, products, and/or effect to be described [or included] in the portfolio will dictate the student work samples to be collected" (p. 422).

**Focus of Work:** "The portfolio can either show student performance over time, or status at one point of time" (p. 422). This is sometimes called a capstone portfolio.

**Nature of Work:** "What kind of evidence [or student work] will be used to show student proficiency--tests, work

samples, observations?" (p. 422).

**Evaluation:** Who is involved in the portfolio evaluation? School-to-work portfolio evaluation will ideally involve the student, instructor, and a related business/community panel.

## *Indicator:*

**To what extent can the assessments detect change over time?**

For example, do the assessments in the curriculum material include pre- and posttests? Or if a portfolio is developed, does it contain student work, and/or a progression of assessments that document student performance over time? The following example excerpted from MAVCC's *Developing Entrepreneurial Attitudes* (1995) incorporates a portfolio project into the course material and provides the instructor with process information:

**What Is an Entrepreneur?**

Much is written and reported each day concerning the increasing importance of entrepreneurship. Throughout this publication, students will be asked to read and collect articles in current periodicals or other types of resource information on the subject of the unit they are studying. These articles and resource information will be compiled into a portfolio, where students will analyze the information they have collected. Therefore, the instructor will need to have (1) a format to be used for a portfolio assignment, and (2) a number of resources available in the classroom for student use in completing research for each portfolio assignment.

**Portfolio Format:** Educators in some states are beginning to use portfolio assignments as alternative methods of evaluating student progress in a field of study--especially student progress in higher-order thinking skills. In states where educators use portfolios, the format for these assignments has generally been dictated.

For the portfolio assignments required in this publication, teachers should use the required guidelines for their state if these have been established. If not, the teacher should develop individual guidelines for the portfolio assignments. Instructors will vary in the importance they place on any of the various elements of a written assignment requiring students to perform at the analysis level (grammar, structure, purpose, relevance, etc.). Therefore, the grading requirements of each of these assignments have been left up to you to establish specifically. The curriculum writer's purpose in creating these assignments was to get students to perform analysis in each unit of instruction, and the relevance and organization of the student product are the only criteria established.

## *Indicator:*

**To what extent are appropriate assessment methods provided that directly reflect student outcomes?**

Once again, the example shown here is explicit about what appropriate assessment will be used, about the desired student outcomes, and about the scoring criteria for the outcomes. Because they support one another, the student learning activity and the assessment in this example (from Stiggins, 1994) are integrated, or contextual.

**Exercise:** You have volunteered to help out at your local library with the literacy program. Once a week after school, you help people learn how to read. To encourage your student to learn, you tell her about the different kinds of literature you have read, including poems, biographies, mysteries, tall tales, fables, and historical novels. Select three types of

literature and compare them, using general characteristics of literature that you think will help your student see the similarities and differences. Be ready to present a visual presentation of this comparison. You will be assessed [based on these criteria]:

**Scoring Criteria:**

*A. Selects Appropriate Items To Be Compared.*

- Selects items that are very well-suited for addressing the basic objective of the comparison, and that show original or creative thinking.
- Selects items that provide a means for successfully addressing the basic objective of the comparison.
- Selects items that satisfy the basic requirements of the comparison, but create some difficulties for completing the task.
- Selects items that are inappropriate to the basic object of the comparison.

*B. Selects Appropriate Characteristics on Which To Compare the Selected Items.*

- Selects characteristics that encompass the most essential aspects of the items that are compared. In addition, the student selects characteristics that present some unique challenges or provide some unique insight.
- Selects characteristics that provide a vehicle for meaningful comparison of the items, and that address the basic objective of the comparison.
- Selects characteristics that provide for a partial comparison of the items and may include some characteristics that are extraneous.
- Selects characteristics that are trivial or do not address the basic objective of the comparison. Selects characteristics on which the items cannot be compared.

*C. Accurately Identifies the Similarities and Differences Between Items on the Identified Characteristics.*

- Accurately assesses all identified similarities and differences for each item on the selected characteristic. Additionally, the student provides inferences from the comparison that were not explicitly requested in the task description.
- Accurately assesses the major similarities and differences in the identified characteristics.
- Makes some important errors in identifying the major similarities and differences in the identified characteristics.
- Makes many significant errors in identifying the major similarities and differences in the identified characteristics.

School-to-work curricula must reflect content which portrays and celebrates the active participation of all individuals in the nation's workforce, communities, and educational institutions.

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# EQUITY & DIVERSITY STANDARD

*Vocational eduacation curricula must reflect content which portrays and celebrates the active participation of all*

*individuals in the nation's workforce, communities, an educational institutions.*

## *Indicator:*

**To what extent is the material balanced to reflect the experiences, contributions, voices, and perspectives of all groups?**

For example:

- Does the content depict a range of family clusters (e.g., adoptive, extended, single parent, same sex)?
- Does the content provide a balance of settings, perspectives, and socioeconomic situations (e.g., rural, urban, suburban)?

## *Indicator:*

**To what extent does the content challenge traditional cultural assumptions?**

Are there references within the material to cultural practices that broaden student awareness of a larger world and allow for acceptance and inclusion of self and others? The following example is from Lafayette High School's *Health and Medical Technology Interdisciplinary Program Curriculum* (Goldberg, 1994). These learning objectives illustrate how course content can broaden students' knowledge in a cultural sense within the context of an integrated curriculum.

**Learning Objective: Health Occupations**

**Core:** What are the different types of family units we see in the USA? How do they function, and what impact do they have on the role of the family during an illness? Students will:

- Explore different types of family units
- Describe how families function
- Describe the role of the family during illness

**History (Global View):** What is the role of the family and its structure in India? Students will learn about the Indian family and the family members' relationships to one another, both within the family and in the society at large.

**English:** How does one learn to function in interpersonal relationships in the absence of family members who serve as role models? Students will read and discuss the short story "Mother in Mannville" by Marjorie Kinan Rawlings, which deals with an orphan.

**Math:** How does family size vary between the USA and Asia? Students will learn to read and interpret tables and charts that show the sizes of families in different cultures, including income data, and to relate family size to family structure and type of society (i.e., economic factors).

The following example is from the *Guide for Integrated and Applied Curriculum, Instruction, and Assessment* by the Wisconsin Department of Public Instruction (1994). This learning task shows students that cultural differences exist and that these differences have an impact on real-life situations. It allows the student to discover and consider other peoples' preferences and needs, and to apply that knowledge to a real-life experience.

**Learning Task: International Guests**

A local business is expecting a group of international buyers next month. This business, which sells agricultural equipment, had an unsuccessful experience the last time international buyers came to town. Not only did the clients not sign a contract to buy anything, but they also left town earlier than planned. Something had gone wrong and the suspected root cause was the company's lack of ability to understand and accommodate the clients' culturally based needs and preferences.

Your group has been asked to design a three-day visit which includes a one-hour reception and four hours of business, both taking place at the company. The rest of the three days will be spent helping the company become better-acquainted with the clients, and helping the clients get to know the company and community.

Working with a small group of other students, research the country's culture and customs (the class will select any country in Asia) and answer the following questions about the clients' probable:

- Food and beverage preferences
- Hotel arrangement preferences (individual vs. shared rooms)
- Leisure activity preferences
- Gift-giving customs
- Attitudes about time (e.g., being on time, taking one's time, etc.)
- Religious practices
- Personal titles (what is the equivalent of Mr./Ms./Mrs.?)
- Communication style (body language, volume, use of silence, etc.)
- Language
- Business customs

Based on your answers to the above questions, design the three-day stay. Include details of what will happen for all 72 hours. Include activities that will make the clients feel welcome and "at home" and avoid elements that make the clients feel unwelcome, offended, or uncomfortable.

See Appendix D for the NCPQ Equity and Diversity Matrix of how and where the standards and indicators reflect nonsexist, culturally inclusive consideration.

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# THE NCPQ REVIEW PROCESS

A major part of the NCPQ's mission is to identify high-quality school-to-work curriculum in the field of education. In pursuit of this goal, NCPQ is seeking to review curriculum products appropriate for use in programs at various levels--secondary through adult. The materials we consider must reflect the following:

- Skills needed in high-wage and high-skill occupations, new and emerging occupations, technology-intensive careers, or curricula addressing new or recently adopted industry skill standards
- Curricula which addresses the use of basic or academic skills and competencies (such as those proposed by the SCANS report) taught in an occupational or work context
- Curriculum and instructional products which reflect work-based learning opportunities, and which are used primarily in youth apprenticeship, cooperative education, and internship programs
- Curricula with integrated vocational-technical and academic content such as materials developed cooperatively by vocational and academic instructors
- Career planning and development curricula designed to enhance school-to-work transitions

# The Review Process

Materials sent to the NCPQ undergo a two-stage review. Phase I, conducted by National Consortium staff, includes a preliminary review of all products using the Standards and Indicators formulated by the National Task Force of the NCPQ. Phase II calls upon the talents of experts nationwide, including other curriculum developers, practitioners, and members of industry.

### *Phase I*

The Phase I review will provide a general indication of the extent to which the curriculum or instructional product reflects the quality standards. For each product submitted, the nominator will receive a completed Phase I Review Feedback Form. This feedback may be helpful in considering the curriculum for adoption, making revisions and enhancements, and guiding future curriculum development efforts designed to expand or supplement the initial curriculum.

### *Phase II*

Materials receiving high scores on the Phase I review will be forwarded to the NCPQ's Panel of Reviewers. This Phase II review will consist of an in-depth assessment of the product by three to five experts, whose selection is based on their familiarity with both the content and instructional design of the product.

Comprehensive Product Profiles will be prepared and disseminated nationally for products emerging from the Phase II review. The Product Profiles will provide instructors, administrators, curriculum specialists, and teams with detailed information on the product and its content, instructional design features, format, and availability.

### *How To Submit Material*

If you are interested in submitting curriculum or instructional products, please contact Linda Heal or Barbara Dougherty for the Submittal Application Form.

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# SAMPLE PRODUCT PROFILE

***This is an initial profile from our pilot-testing efforts.*** *Some of the information provided here is less detailed as a result. Future profile descriptions obtained from the Phase II review process will contain greater detail. We thank the Mid-America Vocational Curriculum Consortium, Inc., for allowing us to reprint this review.*

## Product Information

*Title: Introduction to International Trade*

Components:

1. Introduction to the Careers in International Trade
2. International Trade Regions
3. International Economics and France
4. Import/Export Basics
5. International Marketing

*Abstract* : The following is excerpted from the Foreword to the Teacher Edition of *Introduction to International Trade*:

"These instructional materials provide secondary and postsecondary students with an opportunity to explore the career choices in the international trade occupational areas and introduce them to the basic work-place skills necessary to compete and survive in today's global economy.

"Therefore, Introduction to International Trade is designed to include the entry-level competencies students will need to enter any of the occupational areas identified for international trade. Utilizing these instructional materials, students will have an opportunity to develop a portfolio exploring the interrelationship of the occupational areas of international trade, analyzing current events within a major international trade region, issues relevant to international economics and finance, current events relevant to import/export procedures and documentation, and current events concerning international marketing efforts.

"Instructional materials in this publications are based on the competency-based concept of first stating the objectives (objective sheet), developing instructional strategies for teaching to those objectives (information and assignment sheets), and assessing those same objectives (written test--a criterion -referenced evaluation instrument)."

*Grade Level:* Secondary and Postsecondary

*Reviewers' Response Summary*

**Content Standard-** Elements of the content standard are derived from workforce and career development skills, and nationally validated by educators, business, and industry. The validation process itself is based on accurate and current technical information, as well as the nationally recognized academic standards (e.g., Math, Science, English/Communications, and Social Studies). The indicators of the Content Standard emphasize skills for the larger world of work through the integration of vocational and academic skills, and the incorporation of employability and life

skills within the context of career exploration and development.

**Instructional Standard**- For this standard, instructional practices need to include all students regardless of gender, disability, race, or ethnicity and be easily modified or adaptable to various learning styles and student experiences. Emphases within the Instructional Standard focus on active student involvement in learning; frequent opportunities to apply content ideas and verify their findings; interrelationships among ideas; building strong conceptual frameworks on which to base the development of skills; and the relationships of the content area and to other areas of school curriculum and vocational program.

**Student Assessment Standard**- Evaluation within this standard area concentrates on how assessments are aligned to the curriculum, the use of multiple and alternative assessment methods, and the relationship of assessments to the curriculum outcomes. Analysis and selection of the included assessment methods and instruments should focus on the type of information sought, the use of the information, and the developmental level and maturity of the student.

**Equity and Diversity Standard**- This standard reflects equity and diversity as a behavior (rather than an issue) that is incorporated throughout the instructional material. For submitted material, the evaluation of equity and diversity is based on the materials' context, its suggested learning environments and activities, and its student-teacher interactions. Indicators focus on a balance of experiences, contributions, voices, and perspectives of all groups, and whether the material challenges traditional assumptions.

**Reviewers' Responses**

| **Does the Curriculum Guide...** | |
|---|---|
| Include validated matrix of skills? | **Yes** |
| Identify performance levels? | **No** |
| Have current content? | **Yes** |
| Have accurate content? | **Yes** |
| Sequence content from basic to complex? | **Yes** |
| Assess both teams and individuals? | **Yes** |
| Include assessment tools that reflect content? | **Yes** |
| Use performance/portfolio assessments? | **Yes** |
| Detect change in student knowledge over time? | **No** |
| Use appropriate assessment methods? | **Yes** |
| Challenge traditional cultural assumptions? | **Unsure** |

# Reviewer Comments

Content: A skills matrix is included, as are the SCANS skills. Objectives are identified for each unit. Activities incorporated some of the SCANS competencies. Need to supplement with current journals, newspapers, and media reports to keep the material current. Content is geared toward career information that incorporates vocational and academic skills (i.e., reading, writing, etc.).

**Instructional:** Many discussion and questioning activities. Small rural schools may find activities limiting. Academic experiences reinforced; technology applications are limited.

**Student Assessment:** Material recommends using a portfolio that follows state guidelines. Students are assessed primarily on written materials.

**Equity and Diversity:** Unit 2 includes student activities focusing on the impact of culture on international trade. Material also addresses ways in which countries vary in business attire and protocol.

**Pilot/Field Test Data**: None

**Suggested Modifications by Reviewers**: Examples of how to do math problems not included; would be helpful to have samples.

**Product Develper and Availability:**

Mid-America vocational Curriculum Consortium, Inc.

1500 West Seventh Ave.

Stillwater, OK 74074-4364

800-654-3988

Teacher's Guide and Students' Guides are available; products contain Competency Profile, Instructional/Task Anaylsis, Academic and Workplace Skill Classifications. Produced in 1994.

**Pricing:**

MAVCC Members:

Teacher Guide $19.00

Student Guide $9.50

Non-MAVCC Members

Teacher Guide $35.00

Student Guide $13.00

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# SOURCES OF TECHNICAL ASSISTANCE

## Internet:

**VocServe:** To subscribe, type in at "TO": listserv@cmsa.berkeley.edu. In the message area, type: subscribe vocnet *yourfirstname yourlastname.* Problems? Call NCRVE at (800) 762-4093 and ask to speak to David Carlson.

**School-to-Work Net:** An electronic discussion forum on STW transition, skill standards projects, and the national Youth Fair Chance initiative. Call Dr. Joyce Malyn-Smith or Dr. John Wong at the Center for Education, Employment, and Community Education Development. Phone (617) 969-7100, extension 2386. Or send an e-mail to joycem@edc.org. To send mail to the mailing list, please address the message to stwnet@confer.edc.org.

**AERA Curriculum Net:** E-mail Dr. Gene Glass at Arizona State University: glass@asu.edu and request information on subscribing to AERA-B. This net is primarily focused on higher education, yet it has very useful items for secondary educators.

**AskERIC Gopher:** On your gopher menu go to: Other Information Sources and Gopher Servers; World-Wide Gopher Servers; North America; USA; All; AskERIC; Lesson Plans; and/or Info Guides.

# State Vocational and Technical Education Curriculum Centers

Many states have their own vocational and technical education curriculum centers. These centers provide an array of information, technical assistance, and curriculum materials for the field. Again, you may want to consult with your State SLR for further information regarding the centers. This information was collected from the 1993 Directory of State and Vocational Technical Education Curriculum Centers, published by the East Central Curriculum Center, University of Illinois at Springfield.

**Alabama**

Vocational Curriculum, Research and Evaluation Center

Room 5234

Gordon Persons Building

50 N. Ripley Street

Montgomery, AL 36130-3901

(205) 242-9108

**Alaska**

Alaska Vocational Materials Library

Alaska Department of Education

Adult and Vocational Education

801 W. 10th Street, Suite 200

Juneau, AK 99801

(907) 465-8729

**Arizona**

Arizona Center for Vocational/Technological Education

P.O. Box 6025

Northern Arizona University

Flagstaff, AZ 86011

(602) 523-5442

**Arkansas**

Arkansas Vocational Curriculum Dissemination Center (AVCDC)

University of Arkansas

Graduate Education Building, Room 115

Fayetteville, AR 72701

(501) 575-6606 *or* (800) 632-8754

**Hawaii**

Western CCC

Hawaii Vocational Curriculum Center

1776 University Avenue

UA2, Room 7

Honolulu, HI 96844-0001

(808) 956-7834

**Idaho**

Idaho Vocational Curriculum Dissemination Center

College of Education, Room 209

University of Idaho

Moscow, ID 83844-3083

(208) 885-6556

**Illinois**

East Central CCC

Illinois State Curriculum Center

University of Illinois at Springfield, F-2

Springfield, IL 62794-9243

(217) 786-6375

*National:* (800) 553-8324 *Illinois:* (800) 252-4822

**Indiana**

Indiana Literacy and Technical Education Resource Center

140 N. Senate Avenue, Room 208

Indianapolis, IN 46204

(317) 233-5200 *or* (800) 233-4572

**Kansas**

Kansas Competency-Based Curriculum Center

Benton Hall, Room 412

Washburn University-SAS

1700 College

Topeka, KS 66621

(913) 231-1010 Ext. 1534

**Louisiana**

Louisiana Technical Resource Center

P.O. Box 1159

Natchitoches, LA 71458-1159

(318) 357-3155

**Maine**

Vocational Curriculum Resource Center of Maine (VCRCOM)

Kennebec Valley Technical College

92 Western Avenue

Fairfield, ME 04937-0029

(207) 453-5000

**Massachusetts**

Massachusetts Vocational Curriculum Resource Center

758 Marrett Road

Lexington, MA 02173

*National:* (617) 863-1863 *Massachusetts:* (800) 356-8272

**Michigan**

Michigan Center for Career and Technical Education

230 Erickson Hall

Michigan State University

East Lansing, MI 48824

*National:* (517) 353-4397 *Michigan:* (800) 292-1606

**Minnesota**

Minnesota Educational Services at Capitol View Center

70 W. County Road B-2

Little Canada, MN 55117-1402

(612) 483-4442

*National:* (800) 848-4912 *Minnesota:* (800) 652-9024

**Mississippi**

Southeast CCC

Research and Curriculum Unit

Drawer DX

Mississippi State, MS 39762

(601) 325-2510

**Missouri**

Instructional Materials Laboratory (IML)

Missouri Vocational Resource Center (MVRC)

8 London Hall

University of Missouri

Columbia, MO 65211-0001

(314) 882-2884

*National:* (800) 669-2465 *Missouri:* (800) 392-7217

**Montana**

Montana Center for Research, Curriculum and Personnel Development

Northern Montana College

Box 7751

Havre, MT 59501

(406) 265-3726

**Nebraska**

Nebraska Vocational Curriculum Resource Center

University of Nebraska at Kearney

West Center, W206

Kearney, NE 68849

(308) 234-8669

**New Hampshire**

Learning Resources Center

Mason Library

Keene State College

Keene, NH 03431

(603) 358-2750 *or* (603) 358-2749

**New Jersey**

Northeast CCC

New Jersey Department of Education

Division of Academic Programs and Standards

Office of Adult and Occupational Education

Crest Way

Aberdeen, NJ 07747

(908) 290-1900

**New Mexico**

Vocational Information and Program Services (VIPS) Project

351 Rio Communities Boulevard

Belen, NM 87002

*National:* (505) 864-2823 *New Mexico:* (800) 247-8477

**North Dakota**

North Dakota Vocational Curriculum Library

Bismarck State College

1500 Edwards Avenue

Bismarck, ND 58501

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# APPENDIX A: GLOSSARY OF TERMS

**All aspects of the industry:** "All aspects of the industry or industry sector a student is preparing to enter, including planning, management, finances, technical and production skills, underlying principles of technology, labor and community issues, health and safety issues, and environmental issues, related to such industry or industry sector" (School-to-Work Opportunities Act of 1994, Section 4, Definitions).

**Benchmark:** A goal or best practice. The benchmarking process involves a continuous and systematic analysis of curriculum and its development process. The benchmark evolves as the curriculum evolves.

**Competency:** A knowledge, skill, or attitude needed by a learner to enter, maintain, and/or advance in a subject area or in the workforce.

**Curriculum products:** Print, software, and/or video materials addressing particular content, instructional effectiveness, student assessment, and equity and diversity considerations. Products may be targeted to students and/or instructors, and provide the learner and instructor with some direction on how, what, where, and when class-related learning will take place.

**Emergin vocationalism:** "Developments crucial to the future of education and vocational education and which include a focus that:

- Integrates academic and vocational education;
- Integrates secondary and postsecondary education;
- Develops closer linkages between school and work" (Hayward & Benson, 1993; Rosenstock, 1991).

**Rubric:** A framework or typology.

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# APPENDIX C: NCPQ STANDARDS AND INDICATORS

*The following is a comprehensive list of the Standards and Indicators agreed upon by the National Task Force of the National Consortium for Product Quality. These Standards guide the curriculum review process.*

For each Standard statement, reviewers numerically rate the statement's presence in the material using the Likert Scale that follows.

| 5 | 4 | 3 | 2 1 |
|---|---|---|---|
| **Consistently** Demonstrates standard with great consistency | | **Sometimes** Standard is referred to, but is not applied consistently. | **Never** No reference to the standard can be found in the document. |

## Content Standard

*School-to-work curricula must focus on the integration of academic foundations into career development, life skills,*

*and occupational competencies.*

- To what extent has the content incorporated validated skills, tasks, and/or competencies to consistently and continually reinforce concepts?
- To what extent do the skills and competencies presented in the product correspond to competencies and skills indicated in the SCANS report?
- To what extent does the product include documentation (e.g., a matrix) of validated occupational, academic, career, and life skills and competencies to show where and how those skills and competencies are being incorporated?
- To what extent does the product identify performance levels for skills and competencies?
- To what extent is the content current?
- To what extent is the content accurate?
- To what extent is the content sequenced from basic to more complex concepts or coherent clusters?
- To what extent are the content objectives and learner objectives aligned?
- To what extent is the content presented in an interesting and appealing manner geared toward diverse student audiences?
- To what extent are career development, career awareness and mobility, and citizenship incorporated throughout instructional content?
- To what extent does the instructional material address the following concepts:
    - Are school-to-work and academic skills integrated?
    - Are employability and life skills (e.g., getting to work on time) included?
    - Is inclusive language used?
    - Are diversity and commonalities among people recognized?
    - Are contributions from people of diverse backgrounds recognized?
    - Is transferability of learned skills/knowledge emphasized?

# Instructional Standard

*School-to-work curricula, through active and applied learning experiences in school, community, and work-based settings, must enable students to acquire problem-solving, communication, and reasoning strategies.*

- To what extent do the instructional strategies include active and meaningful learning experiences that correspond to stated student outcomes?
- To what extent do the instructional strategies include teaching techniques that enhance the SCANS thinking skills: creative thinking, decision making, problem solving, seeing things in the mind's eye, knowing how to learn, and reasoning?
- To what extent can the suggested instructional strategies be adapted to different learning styles?
- To what extent do the instructional strategies (i.e., activities and projects) reflect the diversity of today's workforce?
- To what extent do the instructional strategies incorporate team or small group projects?
- To what extent do the instructional strategies encourage students to interact with each other, instructors, and the community?
- To what extent do the instructional strategies develop students' critical thinking and problem-solving skills?
- To what extent do the instructional strategies develop students' skills of writing, speaking, listening, and following directions?
- To what extent do the instructional strategies provide the students with real-world experiences (both in and out

of the classroom) which reinforce academic and technology applications?

## Student Assessment Standard

*Assessments within school-to-work curricula must be student-focused in measuring attitudes, knowledge, and skills, as well as their application to problem solving within the classroom and workplace environment.*

- To what extent are student teams, as well as the individual student, assessed?
- To what extent does the assessment tool(s) measure the attitude, knowledge, and/or skill presented in the material?
- To what extent does the assessment process include feedback and alternative testing opportunities?
- To what extent are performance and portfolio assessments used to measure student knowledge and skills?
- To what extent can the assessments detect change over time?
- To what extent are appropriate assessment methods provided that directly reflect student outcomes?

## Equity/Diversity Standard

*School-to-work curricula must reflect content which portrays and celebrates the active participation of all individuals in the nation's workforce, communities, and educational institutions.*

- To what extent is the material balanced to reflect the experiences, contributions, voices, and perspectives of all groups?
- To what extent does the content challenge traditional cultural assumptions?

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# APPENDIX D: NCPQ EQUITY AND DIVERSITY MATRIX

## How and where the Standards reflect nonsexist, culturally inclusive considerations

In addition to functioning as a stand-alone category, equity and diversity considerations are also thouroughly integrated within the other Standard areas. The Equity and Diversity Matrix before you highlights equity and diversity indicators within each of the Standard areas (for example, inclusive language, recognition of diversity and commonalities among people, and recognition of contributions by people of diverse backgrounds would be equity and diversity considerations within the Content Standard). The matrix also identifies equity and diversity considerations that flow across all the Standard areas. The breadth and scope of these considerations represent the NCPQ's committment to diversity and equity as critical aspects of any curriculum design.