Using Standards in Your Classroom:

A Teacher Resource Guide
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Introduction

Welcome! Using Standards in Your Classroom: A Teacher Resource Guide was written with you, the teacher, in mind. It is meant to serve both as a guide in developing standards-based units and as a practical resource for implementing and understanding standards-based curriculum, instruction, and assessment in your classroom.

Our intent is that this guide be an active resource for the classroom teacher, not be put away on a shelf. It is designed to be straightforward, offering basic information and specific examples. We hope you will find this document useful in your classroom as you develop, revise, and implement standards-based curriculum. Read it, make notes, ask questions, interact with it, use the templates. Let us know what works and what falls short.

Vermont’s Framework of Standards and Learning Opportunities evolved from Vermont’s Common Core of Learning, review of national standards, and consideration of recommendations of professional organizations. All three sections of the Framework – Vital Results Standards, Fields of Knowledge Standards, and Learning Opportunities – are of concern to all teachers. The standards and learning opportunities together focus the design of curriculum, instruction, and assessment. Students need to be provided with certain types of learning opportunities if they are to attain the standards as well as multiple opportunities in which they can demonstrate attainment of standards. This guide provides information on the design and implementation of standards-based units and curriculum.

Using Standards in Your Classroom: A Teacher Resource Guide has been produced through the Vermont/IBM Reinventing Education Partnership in an ongoing collaboration with The Vermont Department of Education. Production has involved the collection and revision of existing professional development materials designed to help teachers implement standards, the creation of new materials and processes, and the field testing, critique, and evaluation of all of these. Much of the material is also found in Standards Into Action: A Professional Development Toolkit.

Standards Into Action: Online Software Tools have been designed to provide tools for teachers to use for calibration, practice, scoring, and development of standards-based rubrics and associated assessments; for designing standards-based units of study; and for sharing and accessing standards-based curriculum and assessment examples and resources.

The tools are available at http://www.standards.ed.state.vt.us

This guide was created by Douglas Snow of the Windsor Southwest Supervisory Union, Nicole Pfister of the Flood Brook School in Londonderry, and Claudine Prairie of the Stowe Middle School, with the assistance of Judy Carr and Sarah Weber of the Vermont/IBM Reinventing Education Partnership and Doug Walker of the Vermont Department of Education.

If you have questions or suggestions about these materials, please contact: The Vermont Department of Education at: 802-828-3111
How to Use This Guide

This guide is divided into ten Instructional Sections and five Appendices that provide templates, a glossary, resources, and a breakdown of Vermont’s standards based on content/concepts, skills/processes, or dispositions.

As you read the guide, you will follow the development of a single standards-based sixth grade science unit. Specific examples are provided along with an explanation of the process.

It is possible to simply start at the beginning of the guide and work through to the end. It is also possible to skip around or focus only on areas of need.

Most sections are broken down into seven subsections:

- **An Introduction**: A boxed explanation introducing the section which is easily identified by the accompanying barn graphic.

- **“In This Section You Will”**: This is a quick and easy way to learn what will be included in the section. It is a list of the key points being addressed.

- **Background Information**: This is designed to provide you with basic information and definitions necessary to understand the material presented within the section.

- **Examples**: These are specific examples taken from a single unit, a sixth grade physics unit easily identified by the accompanying rocket.

- **Critical Questions**: These questions serve two functions: They answer key questions most often asked by teachers. They serve as a guide as you design and develop your standards-based unit.

- **Self Assessment**: This consists of a checklist that serves as a cross-check on your understanding of the subject matter or the design of your standards-based unit.

- **Key Points**: This is a review of the most important elements to remember from the section.
This triangle represents the congruence that is important within any one unit of study and across units of study and other approaches within any one or several classroom(s). Each point on the triangle must be clear, and the relationships between the items must also be intentional. The building of this relationship is essential when using published materials, routines/processes, and new and existing units.

For example:

**Standards**
- What are the standards (and any related evidence) that will be taught and assessed?
- How many standards are reasonable to address given the duration of the unit?
- Are the standards adequately supported by the activities and assessments that are part of the unit?

**Learning-Teaching Activities**
- What learning experiences do all students need in order to attain the identified standards?
- Do the learning-teaching activities build on one another in a logical way toward attainment of the standards?
- Do the learning-teaching activities produce products and performances that are needed for assessment in relation to the identified standards?

**Assessments**
- What assessments are needed to provide feedback to students about their learning in relation to standards?
- Can the products and performances that emerge from the learning-teaching activities be used to assess student learning in relation to standards?
- Are multiple measures incorporated?

**Learner Needs and Strengths**
- What standards have students already attained?
- What do they need in order to attain the standards identified as the focus of the unit?
- What individual needs have to be accommodated? How?
- What accommodations are needed to meet individual and group needs and how will this be done?
Implementation of standards-based curriculum occurs at three different levels, always mindful of the congruence among standards, learning-teaching activities, and assessments.

Within this system the teacher’s roles and responsibilities are defined by the local articulated curriculum aligned with the Vermont Framework.

### State Level

<table>
<thead>
<tr>
<th>Vermont’s Framework of Standards and Learning Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital Results Standards</td>
</tr>
<tr>
<td>Standards-based Comprehensive Assessment System</td>
</tr>
</tbody>
</table>

### District/School Level

<table>
<thead>
<tr>
<th>Locally articulated curriculum aligned with Vermont's Standards and Learning Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards-based Local Comprehensive Assessment System</td>
</tr>
<tr>
<td>State and Local Components</td>
</tr>
<tr>
<td>Use of Results</td>
</tr>
</tbody>
</table>

### Classroom Level

<table>
<thead>
<tr>
<th>Implementation of Local Articulated Curriculum Across Grades and Classrooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of Published Standards-based Curriculum (NSF Mathematics and Science)</td>
</tr>
<tr>
<td>Implementation of Standards-based Units of Study</td>
</tr>
<tr>
<td>Implementation of Standards-based Learning Experiences</td>
</tr>
<tr>
<td>Classroom Standards-based Assessment Plans</td>
</tr>
</tbody>
</table>
Classroom Curriculum

In this section you will be provided with key questions that can help guide you in planning your classroom curriculum or can be used to critique your existing classroom curriculum.

The design of standards-based classroom curriculum is a decision-making process involving the skillful combination and implementation of the four classroom components: new units of study, existing/revised units of study, published materials, and learning experiences/routines. The purpose of the design is to link learners with standards and local articulated curriculum within a classroom and across classrooms and grades, in a consistent and purposeful way.

This decision-making is a recursive process of building strong relationships among standards, learning-teaching activities, assessments, and the strengths and needs of learners so that all students attain the standards.

The classroom curriculum involves making intentional links among identified standards, learners, learning-teaching activities, and assessments through the following classroom components:

Key Questions: In the design process of standards-based curriculum, key questions can help guide your planning.

These questions address:

- Standards
- Learners
- Learning and Teaching Activities
- Materials
- Assessment

for each of the four classroom components. The key questions in the following section may be used as a guide for planning, and they may also be used to critique existing classroom curriculum.
Designing Learning Experiences/Routines to Support and Demonstrate Student Attainment of Vermont Standards

Units of study and published materials are not the only instructional processes used to teach and assess standards. Many learning experiences/routines (e.g., reading strategies, support for the writing process, scientific inquiry, sharing time in kindergarten) cut across or are separate from units of study or published programs. As these learning experiences/routines are carried out, they are taught and assessed in relation to identified standards.

The relationships must be clear and direct among identified standards, the learning-teaching activities used, the assessments provided, and the interest, needs, and level of readiness of the learners involved.

<table>
<thead>
<tr>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What standards are the focus?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning-Teaching Activities and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Do the LT activities build in a logical progression toward the identified standards?</td>
</tr>
<tr>
<td>• Are the LT activities sufficient to support the learning of the desired learning experience/routine?</td>
</tr>
<tr>
<td>• Are additional LT activities needed to supplement existing LT activities?</td>
</tr>
<tr>
<td>• Does the LT activity(s) sufficiently build student understanding of key content and concepts, or are students left with a completed LT activity but little or no understanding?</td>
</tr>
<tr>
<td>• Are the LT activities/materials likely to be of interest to the learners involved?</td>
</tr>
<tr>
<td>• Do LT activities result in products and performances that can be used to assess student learning in relation to standards?</td>
</tr>
<tr>
<td>• Are LT activities/materials age-appropriate for the learners involved?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Do the assessments included provide feedback in relation to the identified standards?</td>
</tr>
<tr>
<td>• Are the assessments sufficient to gather information/document all of the standards that are the focus of the learning experience/routine?</td>
</tr>
<tr>
<td>• Are the assessments of a high quality?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Are there opportunities to find out what learners already know toward attaining the identified standards?</td>
</tr>
<tr>
<td>• When learners have special needs, are LT activities, materials, or assessments appropriately modified?</td>
</tr>
<tr>
<td>• Are there opportunities built in for learners to be made aware of the standards that are the focus of the LT activities/materials and assessments?</td>
</tr>
<tr>
<td>• Are there opportunities for learners to be made aware of how they will be assessed in relation to the identified standards?</td>
</tr>
</tbody>
</table>
Adapting Existing Units/Published Materials to Support and Demonstrate Student Attainment of Vermont Standards

A great deal of development time can be saved when existing units and/or published materials can be used as the basis for standards-based curriculum and assessment connections in the classroom. High-quality published materials such as those identified as exemplary through the VISMT review process, (e.g., Everyday Math, FAST), have undergone a great deal of development and testing far beyond what any one teacher, school, or district could ever hope to carry out. Existing units created by oneself or by other teachers provide learning-teaching (LT) activities and assessments that in many cases can be modified and adjusted to provide ongoing assessment feedback to students in relation to identified standards.

In a standards-based environment, in addition to the quality control check one would want to conduct with any materials or existing units to be used in the classroom, it is critical to examine the links between the LT activities to be used, the assessments that result, the standards that are the focus, and the interests, needs, and prior knowledge of the learners involved. It is how a unit or set of materials is implemented in the classroom that ultimately determines whether or not it is standards-based.

<table>
<thead>
<tr>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What standards relate directly to the materials and assessments included in the unit/published materials?</td>
</tr>
<tr>
<td>• What other standards could be the focus of this topic/theme?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning-Teaching Activities and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Do the LT activities build in a logical progression toward the identified standards?</td>
</tr>
<tr>
<td>• Are the LT activities sufficient to support the learning of the desired content, concepts, processes, and skills needed to attain the standards?</td>
</tr>
<tr>
<td>• Are additional LT activities needed to supplement existing LT activities, or should some be removed?</td>
</tr>
<tr>
<td>• Are the LT activities/materials age-appropriate and likely to be of interest to the learners involved?</td>
</tr>
<tr>
<td>• Does the LT activity sufficiently build student understanding of key content and concepts, or are students left with a completed LT activity but little or no understanding?</td>
</tr>
<tr>
<td>• Do the LT activities result in products and performances that can be used to assess learning in relation to standards?</td>
</tr>
<tr>
<td>• Are the LT activities/materials consistent with the principles in Vermont’s Learning Opportunities?</td>
</tr>
<tr>
<td>• Is the written material at a reading level appropriate for the learners involved?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Do the assessments provide feedback in relation to the identified standards?</td>
</tr>
<tr>
<td>• Are the assessments sufficient to gather information about/document all of the standards that are the focus of the unit/materials?</td>
</tr>
<tr>
<td>• Are the assessments of a high quality?</td>
</tr>
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<td>• Are multiple measures incorporated?</td>
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</tbody>
</table>

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<td>• Are there opportunities to find out what the learners already know toward attaining the identified standards?</td>
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<tr>
<td>• When learners have special needs, are LT activities, materials, or assessments modified appropriately?</td>
</tr>
<tr>
<td>• Are there opportunities built in for learners to be made aware of the standards that are the focus of the LT activities/materials and assessments?</td>
</tr>
<tr>
<td>• Are there opportunities for learners to be made aware of how they will be assessed in relation to the identified standards?</td>
</tr>
</tbody>
</table>
Creating New Units of Study to Support and Demonstrate Student Attainment of Vermont Standards

At times, teachers want or need to use standards to design new units of study, either because there are no high-quality published materials available; they have never taught a unit to address particular standards; or a question or issue of particular interest to the students in the class lends itself to further inquiry. A more detailed checklist of unit components has been developed, and the questions below can also help to guide unit design.

### Standards
- What standards will be taught and assessed through this unit of study?

### Learning-Teaching Activities and Materials
- Do the LT activities build in a logical progression towards the identified standards?
- Are the LT activities sufficient to support the learning of the desired content, concepts, processes, and skills needed to attain the standards?
- Are the LT activities likely to be of interest to the learners involved?
- Do the LT activities sufficiently build student understanding of key content and concepts, or are students left with a completed LT activity but little or no understanding?
- Do the LT activities result in products and performances that can be used to assess learning in relation to standards?
- Are the LT activities age-appropriate for the learners involved?
- Are the LT activities consistent with Vermont’s Learning Opportunities?

### Assessment
- Do the assessments provide feedback in relation to the identified standards?
- Are the assessments sufficient to gather information about/document all of the standards that are the focus of the unit?
- Are the assessments of a high quality?
- Are multiple measures incorporated?

### Learners
- Are there opportunities to find out what the learners already know toward attaining the identified standards?
- When learners have special needs, are LT activities, materials, or assessments modified appropriately?
- Are there opportunities built in for LT activities to be made aware of the standards that are the focus of the LT activities and assessments?
- Are there opportunities for learners to be made aware of how they will be assessed in relation to the identified standards?
Where to Start?

1) Where is the best place to start when developing a standards-based unit?

Standards-based curriculum development is not a linear process. It is not the order of the planning that is important, but the integrity of the congruence among the standards, the learning-teaching activities, the assessments, and the needs, interests, and strengths of the learners for whom the unit is being designed. Engaging in standards-based curriculum development doesn’t mean that existing units of study need to be discarded or that all new units need to be built. Starting points can originate from existing units of study or published materials; student questions, issues, and concerns; or standards. There is no one place to begin, but the relationships need to be built that will help all students to attain the identified standards. On the next pages, we will see how these relationships can be build in a sample unit of study: “Force, Matter, and Motion.”

2) What are the advantages and disadvantages of different approaches?

<table>
<thead>
<tr>
<th>Approach</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting with existing Units of Study or Published Materials.</td>
<td>Allows teachers to work with something familiar while learning the new skill of standards-based curriculum and assessment design.</td>
<td>It is hard to “let go” of favorite LT activities and assessments.</td>
</tr>
<tr>
<td>Starting with Student Questions, Issues, and Concerns.</td>
<td>Helps to ensure relevance, enhance student interest, and motivate students to learn. Stimulates development of new LT activities and assessment.</td>
<td>Can conflict with prescribed district or school curriculum sequence. Students may not have the depth of knowledge needed to raise some essential questions.</td>
</tr>
<tr>
<td>Starting with Standards.</td>
<td>Ensures focus on standards.</td>
<td>May overwhelm teachers if the perception is that all units of study must be entirely new. May lack relevance to student questions, issues, and concerns.</td>
</tr>
</tbody>
</table>
Standards-Based Unit Components

The checklist below is designed to clarify the components for standards-based units of study, one part of a much larger system of curriculum, instruction, and assessment designed to help students attain Vermont’s standards. This checklist can be used for self-assessment when developing standards-based units. It is used to jury units of study at the state level in Vermont.

Ultimately, what is important is the congruence among a focus on standards, the learning-teaching activities selected to engage students, and the assessments used to document student attainment of the standards.

Published materials, units of study, skill sequences, instructional experiences, routines, or strategies, and assessments are useful to the extent they link learners with standards within a classroom and across classrooms and grades, in a consistent and purposeful way.

<table>
<thead>
<tr>
<th>Vermont Checklist for Juried Standards-Based Units of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>___ Vermont Standards</strong></td>
</tr>
<tr>
<td>• One or more of Vermont’s vital results standards and one or more of knowledge standards will be formally assessed.</td>
</tr>
<tr>
<td>• Standards focus on BOTH knowledge (concepts/content) and skills. (processes)</td>
</tr>
<tr>
<td>• Standards and evidence and related assessment criteria (see below) are made explicit to students.</td>
</tr>
<tr>
<td>• The number of standards and evidence identified is appropriate to the scope (duration, time allocated) of the unit.</td>
</tr>
<tr>
<td><strong>___ Topic/Concepts /Focusing Question(s) (Need one or more of these three)</strong></td>
</tr>
<tr>
<td>• Topic</td>
</tr>
<tr>
<td>... Is suitable to students’ age and abilities and interests.</td>
</tr>
<tr>
<td>... Is manageable (not too difficult, too big, or too demanding of time and resources).</td>
</tr>
<tr>
<td>• Concepts</td>
</tr>
<tr>
<td>... Can be traced directly to standards.</td>
</tr>
<tr>
<td>... Are related to the topic.</td>
</tr>
<tr>
<td>... Lead to focusing questions.</td>
</tr>
<tr>
<td>• Focusing Questions</td>
</tr>
<tr>
<td>Cause students to consider and analyze important ideas, trends, patterns.</td>
</tr>
<tr>
<td>Students’ responses to focusing questions will be a good measure of their understanding of the major concepts of the unit.</td>
</tr>
<tr>
<td><strong>___ Learning-Teaching Activities and Resources</strong></td>
</tr>
<tr>
<td>• Related to one or more standards and evidence.</td>
</tr>
<tr>
<td>• Strategically take students from where they are to the desired learning.</td>
</tr>
<tr>
<td>• Lead to products and performances or culminating activities that can be used to assess student learning in relation to the identified standards.</td>
</tr>
<tr>
<td>• Learning-Teaching activities are consistent with Vermont’s Learning Opportunities (In particular, B1-5, A3-4 for Access and relevant Field of Knowledge Learning Opportunities).</td>
</tr>
</tbody>
</table>
# Standards-Based Unit Components

| Products and Performances | • Provide evidence of student learning in relation to the standards and evidence that are the focus of the unit.  
• Balance oral, written, visual, and kinesthetic modes as appropriate to the standards and evidence being documented. |
| --- | --- |
| Assessment | • Assessment is consistent with Vermont’s Learning Opportunities (C1-5 Assessment and Reporting)  
• **Assessment Criteria**  
  ... Clearly specify the dimensions or characteristics of standards and evidence on which student work will be assessed.  
• **Assessment Plan**  
  ... Identifies types of assessment tools (e.g. rubrics, tests, structured observation) by which standards will be assessed.  
  ... Represents multiple opportunities for assessment and feedback.  
  ... Addresses all standards that are the focus of the unit.  
• **Assessment Tools**  
  ... Are embedded in learning-teaching activities and products and performances.  
  ... Are anchored in exemplars and benchmarked student work.  
• **Use of Data**  
  ... Provides students with information about how they are performing in relation to standards, how they can improve, and what they have accomplished. |
| Exemplars of Student Work (in completed or juried units) | • Include multiple examples of student work that clearly meets the identified standards and criteria.  
• Are shared with students in advance so they can begin to assess their own work in relation to standards. |
| Unit/Format Requirements/Calendar | • A cover page is included that lists unit title, creator(s), name(s), school name, home address, and phone and email address.  
• An abstract (1-2 paragraphs) is included to provide a brief overview of the unit.  
• The relationship among the components is clearly evident.  
• Includes a clear time line or calendar showing what will happen when.  
• Includes headings and other organized features which make the written document easy to follow.  
• Completed assessment tools, handouts, and other materials developed for the unit are incorporated or appended.  
• Copyright laws are adhered to when including material from other sources.  
• When ideas are borrowed, the source is cited in the text and listed in a resources bibliography.  
• Direct relationship to school’s/district’s articulated curriculum. |
Information About Focusing Questions

1) What are focusing questions?

Focusing questions are the organizing element for tying together standards and activities. They are questions used to shape a unit of study, to intrigue and focus students on the issues at hand, and to develop strong intellectual habits. They should be important and relevant to the learner, and they should help organize the search for new answers.

2) From where do focusing questions come?

Students of all ages have questions about themselves, their communities, and their world. Bringing those questions to the surface, identifying commonalities, and basing units of study on these themes is one method of engaging and motivating students. A questionnaire can help you collect student questions. Focusing questions can also come from local community problems and issues (e.g. Should a new hydro-electric plant be built? Why are there mountains in Vermont?), from teacher interests, from local curriculum guides, or from questions central to the disciplines (e.g. What is real? Why is this lake dying?)

3) What are some criteria for making good focusing questions?

When forming focusing questions, think about the criteria in the checklist below.

Focusing Questions are important and:

- go to the heart of a discipline/topic/theme
- have no one obvious “right” answer
- are “higher order”
- allow several of the Vermont standards to be addressed

Focusing Questions are relevant to the learner and:

- can be understood by the students
- can be provided by the students
- involve personal concerns of most of the students
- involve larger world concerns of social significance

Focusing Questions help organize the search for answers and:

- suggest a focus or organizational structure to the LT activities
- engage a wide range of knowledge, skills, and resources
- pose opportunities for in-depth and extended work
- present possibilities for a wide variety of LT activities
- should be realistic, given time and resources
- present possibilities for personal and social action both in school and in the community
- provide opportunities for culminating LT activities where students demonstrate how they have grappled with the questions
**Focusing Questions**

Focusing questions are used to shape a unit of study. They differ from “basic” questions in their breadth and in their ability to intrigue and focus students on the issues at hand, and develop strong intellectual habits.

<table>
<thead>
<tr>
<th>Basic Questions</th>
<th>Focusing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Art:</strong> Color Unit</td>
<td><strong>Art:</strong> Color Unit</td>
</tr>
<tr>
<td>What are the primary colors?</td>
<td>Why is this painting beautiful?</td>
</tr>
<tr>
<td>What happens when blue and yellow are combined?</td>
<td>How does this work affect you emotionally?</td>
</tr>
<tr>
<td><strong>Geometry:</strong> Course Introduction</td>
<td><strong>Geometry:</strong> Course Introduction</td>
</tr>
<tr>
<td>Given two sides of a triangle, what is the length of the third side?</td>
<td>Could Pythagoras have used a parallelogram to prove his theorem?</td>
</tr>
<tr>
<td><strong>Western Civilization:</strong> Government</td>
<td><strong>Western Civilization:</strong> Government</td>
</tr>
<tr>
<td>What are the characteristics of a democratic society?</td>
<td>Did “democracy” mean the same thing when the country was founded as it does today?</td>
</tr>
<tr>
<td><strong>Music Appreciation:</strong></td>
<td><strong>Music Appreciation:</strong></td>
</tr>
<tr>
<td>What sounds do you hear on the recording?</td>
<td>Why do some combinations of notes sound better to us than others?</td>
</tr>
<tr>
<td><strong>Algebra:</strong> Quadratic Equations</td>
<td><strong>Algebra:</strong> Quadratic Equations</td>
</tr>
<tr>
<td>What is a quadratic equation?</td>
<td>Where did the quadratic equation come from and what practical value does it have?</td>
</tr>
<tr>
<td><strong>English:</strong> Novels of Dickens</td>
<td><strong>English:</strong> Novels of Dickens</td>
</tr>
<tr>
<td>What were the major events in the life of David Copperfield?</td>
<td>What makes this book a “classic”?</td>
</tr>
<tr>
<td><strong>Computers and Society:</strong></td>
<td><strong>Computers and Society:</strong></td>
</tr>
<tr>
<td>How can we track our book inventory with this program?</td>
<td>Have computers changed us in any way?</td>
</tr>
<tr>
<td><strong>American History:</strong> Civil War</td>
<td><strong>American History:</strong> Civil War</td>
</tr>
<tr>
<td>What were the five causes of the Civil War?</td>
<td>Were there people who opposed the war, and, if so, what did they do?</td>
</tr>
</tbody>
</table>

An Example of Focusing Questions

I plan to teach a sixth grade physics unit. I have decided upon the following two focusing questions taken from questions my students have asked.

- Could perpetual motion really happen within the Earth’s solar system?
- At what point does a space rocket escape the Earth’s gravitational pull?

I think students will find the perpetual motion question intriguing. In order to respond to this question, a student must have an understanding of the different forces acting upon moving objects, such as gravity and friction. Students also need to understand the relationship between mass, force, and resulting speed.

The rocket question commands an understanding of the laws of motion, the force of gravity, and the relationship between mass, applied force, and the resulting change in speed or direction. Both of these questions present possibilities for a wide variety of activities and investigations.
Selecting Standards

It is essential that you identify the standards to which you are teaching and assessing in your standards-based unit. This section will help you decide which standards to select and how many.

In this section you will:

• Look at a definition of standards, essential knowledge, and essential skills

• Learn to select standards to be taught and assessed in a standards-based unit of study

• Learn how to determine and balance the number of standards within a unit of study

• Look at standards selected for a standards-based unit

• Be provided with critical questions for selecting standards for a unit of study
1) **What are standards and evidence?**

Standards identify what all students should know and be able to do. They specify the essential knowledge and skills that should be taught and learned in school. **Essential knowledge** is what students should know. It includes the most important and enduring ideas, issues, dilemmas, principles, and concepts from the disciplines. **Essential skills** are what students should be able to do. Skills are ways of thinking, working, communicating, and investigating.

Standards also identify **behaviors and attitudes** related to success in and outside of school. These include (but are not limited to) providing evidence to back up assertions and developing productive, satisfying relationships with others. Within Vermont’s Framework of Standards and Learning Opportunities, many of the standards are accompanied by **evidence**. The evidence, taken collectively, is the indicator by which the student demonstrates whether he or she has met the standards.

3) **Which standards and evidence should be selected to assess in a standards-based unit of study?**

In Vermont, most teachers work with the standards and evidence in Vermont’s Framework of Standards and Learning Opportunities since these are the standards on which Vermont’s comprehensive assessment system is based. Some local districts have adopted the Vermont standards as their own local standards, while others have incorporated national or other standards as well. Whether focusing only on Vermont standards or on these as well as standards from other sources, what is important is that the standards identified be taught and assessed in the unit.

2) **What is an example of a standard with accompanying evidence?**

### Science, Mathematics, and Technology Standards

<table>
<thead>
<tr>
<th>PreK-4</th>
<th>5-8</th>
<th>9-12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roles and Responsibilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students analyze the roles and responsibilities of scientists, mathematicians, and technologists in social, economic, cultural, and political systems. This is evident when students:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Explain how discoveries or inventions can help or hurt people (e.g., the environmental impact of energy consumption).</td>
<td>aa. Analyze the roles and responsibilities of scientists, mathematicians, and technologists in relation to ongoing research and discoveries that impact society (e.g., the dangers and benefits of nuclear energy).</td>
<td>aaa. Analyze the impact of scientific, mathematical, and technological investigations into and findings about human society, including the ethical issues involved (e.g., the dangers and benefits of genetic engineering).</td>
</tr>
</tbody>
</table>
Selecting Standards

4) *Do I need to include both the Fields of Knowledge and the Vital Results standards when designing my standards-based unit of study?*

Vermont’s jurying process requires that a standards-based unit of study include one or more of Vermont’s Vital Results standards and one or more Fields of Knowledge standards to be assessed. Essential to this process is a focus on knowledge and skills.

5) *How many standards should be chosen for a unit of study?*

Determining the **right number** of standards is a matter of balance and judgment. Learners need the opportunity to demonstrate their attainment of standards as a result of their participation in any standards-based unit of study.

The appropriate number of standards for a given unit is the number that can be *taught AND assessed* during the course of the unit. Variables such as the duration of the unit, the amount of class time devoted to the unit, the prior learning of the students, and the total number of standards for which the educator is responsible together determine the “right” number of standards to include.

The number of standards and evidence identified needs to be appropriate to the scope (duration, time allocated) of the unit.

---

Factors influencing the selection and number of standards within a unit of study:

- Duration of unit
- Class time
- Prior learning
- Standards for which you are responsible
An Example of Selecting Standards

This is a sixth grade science class that meets twice a week for 1 hour and 20 minutes. The duration of the unit is approximately eight weeks.

When I select standards for my physics unit I want to remember several guidelines:

1) Standards should be selected from both the Vital Results and the Fields of Knowledge.
2) Focus should be on both knowledge and skills.
3) Given the duration of my unit (approximately eight weeks), students should be provided with sufficient time to attain the selected standards.

Selecting Standards from the Fields of Knowledge:

1) My physics unit includes many experiments and activities that provide students with an understanding of matter, force, and motion. Students record data, make observations, and draw conclusions as they begin to understand these concepts. There will be many opportunities to teach and assess the scientific method, so it makes sense to select Standard 7.1, Scientific Method, in the Science, Mathematics, and Technology Standards. This standard focuses on processes and skills, so it provides a nice balance to Standard 7.12, which focuses on knowledge.

Inquiry, Experimentation, and Theory

Scientific Method

7.1 Students use scientific methods to describe, investigate, and explain phenomena:

Raise Questions:
• Generate alternative explanations—hypotheses—based on observations and prior knowledge;
• Design inquiry that allows these explanations to be tested;
• Deduce the expected results;
• Gather and analyze data to compare the actual results to the expected outcomes; and
• Make and communicate conclusions, generating new questions raised by observations and readings.

I look to the evidence in Vermont’s Framework to further define the expectations in relation to the standards. I see that four pieces of evidence clearly articulate my expectations for my students and their understanding of the scientific process.

Students:

aa. Frame questions in a way that distinguishes causes and effects; identify variables that influence the situation and can be controlled;
bb. Seek, record, and use information from reliable sources, including scientific knowledge, observation, and experimentation;
cc. Create hypotheses to problems, design their own experiments to test their hypothesis, collect
Selecting Standards

data through observation and instrumentation, and analyze data to draw conclusions; use conclusions to clarify understanding and generate new questions to be explored;

dd. Describe, explain, and model, using evidence that includes scientific principles and observations.


Space, Time, and Matter
Matter, Motion, Forces, and Energy

7.12 Students understand forces and motion, the properties and composition of matter, and energy sources and transformations.

I want my students to have an understanding of two of the concepts identified in this standard: forces and motion and the properties and composition of matter. But these descriptions are fairly broad and I want to be more specific in my expectations.

I look to the evidence:
Again, the evidence in Vermont’s Framework helps to further define the expectations in relation to the standards. At this point in the process, in addition to the standards identified above, it is advantageous to identify the evidence.

I see that four pieces of evidence directly reflect the knowledge I want my students to be able to demonstrate upon completion of this physics unit: aa, b, bb, and dd. I also notice that one piece of evidence, cc, includes the relationships between pressure, volume, and the amount of gas. Now this is something I had not yet considered for my unit, but it makes perfect sense to include. I have now identified the evidence that ties directly to the concepts of my unit.

aa. Observe and measure characteristic properties of matter (e.g., boiling point, melting point, density, buoyancy, simple chemical reactions), and use them to distinguish one substance from another;

b. Observe and describe changes of states of matter;

bb. Provide examples of substances reacting chemically to form new substances with different characteristics, and describe and model the phenomenon with reference to elements and compounds;

dd. Observe and demonstrate a qualitative understanding of the relationship between mass, the magnitude of an applied net force, and the resulting change in speed and direction.
Note:
In previous units, Standard 1.17, Notation and Representation, was taught and assessed. Students will be expected to apply their understanding of this standard in the physics unit; however, I have decided not to select this standard as a focus of the unit.

Selecting Standards from the Vital Results:

I feel very strongly that my students should be able to talk about science to other people. We are studying presentation skills in language arts so I could carry this into the science arena. This presents a wonderful opportunity for students to demonstrate their understanding of the scientific method as well as the main concepts of the unit through verbal expression. Therefore I will select the communication Standard 1.15 for my physics unit.

Expression
Speaking
1.15 Students use verbal and non-verbal skills to express themselves effectively.

Again, I look to the evidence in Vermont’s Framework to further define the expectations in relation to the standard. I select two pieces of evidence that my students can work to attain.

c. Show awareness of an audience by planning and adjusting to its reaction;
d. Make effective use of such devices as pace, volume, stress, enunciation, and pronunciation.

Evidence c, responding to an audience, gives me an idea. Instead of a formal presentation, students could present in a more interactive format where they react directly to questions and response from an audience.

Now that I have selected my standards, two from the Fields of Knowledge and one from the Vital Results, I go back to see if my Focusing Questions are directly in line with these standards, and I decide they are.

• Could perpetual motion really happen within the Earth’s solar system?
• At what point does a space rocket escape the Earth’s gravitational pull?

What about the Learning Opportunities?

I will now go to the learning opportunities to review Access, Instruction, Assessment and Reporting, Connections, and Best Practices to make certain I am implementing practices that will support all students in attaining the standards. I can see that interdisciplinary connections will be made. I remind myself that multiple assessment strategies must be used. I see that this will be a wonderful unit to assume a variety of teaching roles (e.g. directing, facilitating, guiding). The section that sets off a light bulb is: Student Involvement in Assessment. I see that the verbal presentations present an opportunity to have the students involved in assessment.
Selecting Standards

Critical Questions for Selecting Standards

**Question 1**
Consider your topic, concepts, and focusing questions, what do you want your students to know and be able to do?

**Question 2**
Which standards will provide evidence that your students have attained this knowledge and these skills?

**Question 3**
Given the time allotted to teach the unit, what standards will you be able to teach and assess?

Remember, these standards will include:

- one or more of the Vital Results standards
- one or more of the Fields of Knowledge standards
Self-Assessment

Use the following checklist to assess your selection of standards.

- Given the time allotted for this unit, have you selected a reasonable number of standards that you will be able to teach and assess?

- Have you included one or more of the Fields of Knowledge standards and one or more of the Vital Results standards?

Key Points to Remember

- Standards identify what all students should know and be able to do.

- The appropriate number of standards and evidence for a given unit is the number that can be taught AND assessed during the course of the unit.

- A standards-based unit of study includes one or more of Vermont’s Vital Results standards and one or more Fields of Knowledge standards.

- The number of standards and evidence identified should be appropriate to the scope (duration, time allocated) of the unit.
In this section you will:

- Learn about three different kinds of LT activities and their use in the classroom
- Learn to align LT activities with standards
- Learn the importance of organizing LT activities in a logical progression
- Look at examples of a Learning-Teaching Activity Progression
- Have an opportunity to design a Learning-Teaching Activity Progression
1) **What are learning-teaching activities?**

- All of the instructional strategies in the previous section are learning and teaching activities. These are the means through which students learn and demonstrate particular skills, knowledge, and habits of mind (critical thinking, creative thinking, self-regulation) relative to desired standards.

2) **What are the different types of instructional activities and how are they used in the classroom?**

   Activities fall into one of four main types:

   **Introductory Activities**
   - *Introductory* activities generate student interest in a unit of study and are:
     - interesting
     - stimulating
     - interactive when possible

   **Instructional Activities**
   - *Instructional* activities provide opportunities for students to learn and demonstrate specific skills, knowledge, and habits of mind, and are:
     - sequenced
     - related to specific standards and evidence
     - knowledge and skill-building blocks
     - interesting and engaging
     - active and interactive when possible
     - used to assess student performance

   **Assessment Activities**
   - *Assessment* activities are designed to formulate specific information relative to student progress toward attainment of standards and are:
     - interesting
     - stimulating

   **Culminating Activities**
   - *Culminating* activities are designed to be used at the end of a specific unit. These activities allow students to demonstrate learning of most or all of the identified standards within a given unit. Culminating activities provide opportunities for:
     - direct application of skills and knowledge
     - motivating students toward self-direction
     - interaction with others including audiences, parents, and/or school community

   Together, the activities create a progression with respect to what students are asked to do: they serve as the building blocks to the necessary knowledge, skills, and habits of mind needed to attain the standard. Activities should accommodate a range of learning styles and multiple intelligences and be developmentally appropriate for the students who will carry them out.

3) **How are standards-based activities selected?**

   - These are selected based on their utility in helping students learn and demonstrate attainment of knowledge and skills in the identified standards and on their appropriateness in relation to other instructional activities in the learning sequence (see previous section).

   - Activities should accommodate a range of learning styles and multiple intelligences and be developmentally appropriate for the students who will carry them out.

4) **What is a Learning-Teaching Activity Progression?**

   - This is the organization of activities in a purposeful and logical order for both knowledge and skills. The activities must be intentionally built to provide the building blocks that will lead students to the attainment of standards. Together, the activities create a progression with respect to what students need to know or be able to do.

5) **So where does one start when planning learning-teaching activities?**

   There are different places you can start. These could include:

   - Focusing questions
   - Identified standards
   - Culminating activity
Recall the two Fields of Knowledge standards I have identified for my physics unit:

7.1 Students use scientific methods to describe, investigate, and explain phenomena:

7.12 Students understand forces and motion, the properties and composition of matter, and energy sources and transformations.

For each of these standards, students must have multiple opportunities to acquire the skills and knowledge necessary to attain them. The evidence, taken directly from the standards, provides clear articulation of these skills and knowledge.

Look at the Learning-Teaching Activity Progressions for standards 7.1 and 7.12 that follow. These LT activities are sequenced in a logical order that creates a progression of learning and understanding.

The Introductory Activity for this unit, The Great Ice Cube Melt, is a competition to stimulate interest and enthusiasm and introduce the topic of states of matter and physical properties.

The Instructional Activities that follow are sequenced to provide a progression of understanding. Take, for example, “identifying variables.” Students are first introduced to the topic of variables in the Instructional Activity Cubes to Steam. Following this investigation, students will strengthen their understanding of variables, controls, and scientific method in several subsequent LT activities: Falling Bodies, Marble Roll, Motion Centers, and Is Air Matter?

In the Culminating Activity, Scientifically Speaking, students have an opportunity to demonstrate their attainment of the identified standards for the unit. They will be asked to combine their understanding of scientific method, their scientific skills, and their acquired content knowledge with their presentation skills (Standard 1.15), in order to successfully meet the criteria for “Scientifically Speaking.”

Recall the Vital Result standard identified for this physics unit:

1.15 Students use verbal and non-verbal skills to express themselves effectively.

Look carefully at the following pages at the Learning-Teaching Activity Progressions for the identified standards of the unit. The charts on the following pages illustrate a process of task analysis leading to a strategic progression of learning in relation to the identified standards.
**Scientific Method**

7.1 Students use scientific methods to describe, investigate and explain phenomena.

<table>
<thead>
<tr>
<th>LT activity</th>
<th>Ice Cube Melt</th>
<th>Cube to Steam</th>
<th>Falling Bodies</th>
<th>Motion Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>related knowledge or skills</td>
<td>identify variables</td>
<td>identify variables</td>
<td>identify variables</td>
<td>record/analyze data</td>
</tr>
<tr>
<td>standard / evidence</td>
<td>7.1 aa</td>
<td>7.1 aa,bb,cc</td>
<td>7.1 aa,bb,cc</td>
<td>7.1 aa,bb,cc,dd</td>
</tr>
</tbody>
</table>

**Space, Time, and Matter, Matter, Motion, and Energy**

7.12 Students understand forces and motion, the properties and composition of matter, and energy sources and transformation.

<table>
<thead>
<tr>
<th>LT activity</th>
<th>Ice Cube Melt</th>
<th>Cubes to Steam</th>
<th>Cotton &amp; Bread Intriguing Objects</th>
<th>Jar and Candle Seltzer Bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td>related knowledge or skills</td>
<td>changes states of matter</td>
<td>properties of matter: changes in states of matter</td>
<td>properties of matter: density</td>
<td>properties of matter, substances reacting chemically</td>
</tr>
<tr>
<td>standard / evidence</td>
<td>7.12 b</td>
<td>7.12 b,aa</td>
<td>7.12 aa</td>
<td>7.12 aa,bb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LT activity</th>
<th>Motion Centers</th>
<th>Marble Roll</th>
<th>Balloon Rockets</th>
<th>Is Air Matter?</th>
</tr>
</thead>
<tbody>
<tr>
<td>related knowledge or skills</td>
<td>relationship between mass, applied force, resulting change of speed and direction</td>
<td>relationship between mass, applied force, resulting change of speed and direction</td>
<td>relationship between mass, applied force, resulting change of speed and direction</td>
<td>properties of matter</td>
</tr>
<tr>
<td>standard / evidence</td>
<td>7.12 dd</td>
<td>7.12 dd</td>
<td>7.12 dd</td>
<td>7.12 aa</td>
</tr>
</tbody>
</table>

**Speaking**

1.15 Students use verbal and nonverbal skills to express themselves effectively.

<table>
<thead>
<tr>
<th>LT activity</th>
<th>Can You Hear Me?</th>
<th>Am I Talking Too Fast?</th>
<th>Let Me Tell You</th>
<th>Short Story Take Two</th>
<th>Scientifically Speaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>related knowledge or skills</td>
<td>volume</td>
<td>different hats</td>
<td>volume, pace, enunciation, stress, awareness of audience</td>
<td>volume, pace, enunciation, stress, awareness of audience</td>
<td>volume, pace, enunciation, stress, awareness of audience</td>
</tr>
<tr>
<td>standard / evidence</td>
<td>1.15 d</td>
<td>1.15 d</td>
<td>1.15 d,c</td>
<td>1.15 d,c</td>
<td>1.15 d,c</td>
</tr>
</tbody>
</table>
### Classroom Planning

The Same Learning-Teaching Activity Progressions in Another Format

### Scientific Method

7.1 Students use scientific methods to describe, investigate, and explain phenomena.

<table>
<thead>
<tr>
<th>standard / evidence</th>
<th>related knowledge and skills</th>
<th>LT activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1aa</td>
<td>identify variables</td>
<td>Ice Cube Melt</td>
</tr>
<tr>
<td>7.1 aa,bb,cc</td>
<td>identify variables record data draw conclusions</td>
<td>Cubes to Steam</td>
</tr>
<tr>
<td>7.1 aa,bb,cc</td>
<td>identify variables record data draw conclusions</td>
<td>Falling Bodies</td>
</tr>
<tr>
<td>7.1 bb,cc, dd</td>
<td>record/analyze data draw conclusions explain data</td>
<td>Motion Centers</td>
</tr>
<tr>
<td>7.1 aa,bb,cc</td>
<td>identify variables record data draw conclusions</td>
<td>Marble Roll</td>
</tr>
<tr>
<td>7.1 aa,bb,cc</td>
<td>identify variables record data draw conclusions</td>
<td>Balloon Rockets</td>
</tr>
<tr>
<td>7.1 aa, cc, dd, dd</td>
<td>identify variables record/analyze data draw conclusions explain data</td>
<td>Is Air matter?</td>
</tr>
<tr>
<td>7.1 aa,bb,cc, dd</td>
<td>identify variables record/analyze data draw conclusions explain data</td>
<td>Scientifically Speaking</td>
</tr>
</tbody>
</table>
Matter, Motion, and Energy

7.12 Students understand forces and motion, the properties and composition of matter, and energy sources and transformation.

<table>
<thead>
<tr>
<th>standard / evidence</th>
<th>related knowledge and skills</th>
<th>LT activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.12 b</td>
<td>changes of states of matter</td>
<td>Ice Cube Melt</td>
</tr>
<tr>
<td>7.12 b,aa</td>
<td>changes of states of matter</td>
<td>Cubes to Steam</td>
</tr>
<tr>
<td></td>
<td>properties of matter</td>
<td></td>
</tr>
<tr>
<td>7.12 aa</td>
<td>properties of matter</td>
<td>Cotton &amp; Bread &amp; Intriguing Objects</td>
</tr>
<tr>
<td>7.12 aa,bb</td>
<td>properties of matter</td>
<td>Jar and Candle</td>
</tr>
<tr>
<td></td>
<td>chemical reactions</td>
<td></td>
</tr>
<tr>
<td>7.12 dd</td>
<td>relationship: mass/force and change in speed/direction</td>
<td>Motion Centers</td>
</tr>
<tr>
<td>7.12 dd</td>
<td>relationship: mass/force and change in speed/direction</td>
<td>Marble Roll</td>
</tr>
<tr>
<td>7.12 dd</td>
<td>relationship: mass/force and change in speed/direction</td>
<td>Balloon Rockets</td>
</tr>
<tr>
<td>7.12 aa</td>
<td>properties of matter</td>
<td>Is Air Matter?</td>
</tr>
</tbody>
</table>
**Classroom Planning**

### Speaking

1.15  Students use verbal and nonverbal skills to express themselves effectively.

<table>
<thead>
<tr>
<th>standard / evidence</th>
<th>related knowledge and skills</th>
<th>LT activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.15 d</td>
<td>volume</td>
<td>“Can You Hear Me?”</td>
</tr>
<tr>
<td></td>
<td>enunciation</td>
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<td></td>
<td>pace</td>
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<tr>
<td></td>
<td>stress</td>
<td></td>
</tr>
<tr>
<td>1.15 d</td>
<td>volume</td>
<td>“Am I Talking Too Fast?”</td>
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<td></td>
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<td>stress</td>
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<td>1.15 d</td>
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<td>stress</td>
<td></td>
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<td></td>
<td>awareness of audience</td>
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<tr>
<td>1.15 d,c</td>
<td>volume</td>
<td>Short Story, Take 2</td>
</tr>
<tr>
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<td>pace</td>
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</tr>
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<td></td>
<td>enunciation</td>
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</tr>
<tr>
<td></td>
<td>awareness of audience</td>
<td></td>
</tr>
</tbody>
</table>
Critical Questions About
Designing Learning-Teaching Activity Progressions

Use the following steps to plan a learning-teaching activity progression for your classroom. There are templates for the learning-teaching activity progressions both on the following pages and in the appendix.

• Question 1

What standards will your students be working to attain and how will you know your students have attained the standard?

Given the standard that you have identified, determine what it is you want your students to know or be able to do in order to demonstrate attainment of this standard. Look to the evidence to help define this. Standards will sometimes specifically indicate products or performances.

• Question 2

What related skills or knowledge will your students need in order to be successful?

Use the form on the next page to list the related skills and knowledge your students will need in order to demonstrate attainment of the standard and its evidence. The related skills and knowledge may come directly from evidence in the Framework, from the local articulated curriculum, from published materials, from textbooks, or from other sources.

• Question 3

What are the LT activities through which students will learn and demonstrate the skills and knowledge you have listed in Question 2?

Brainstorm connections, possibilities, and resources before planning specific activities. Given the standard you have identified and the skills and knowledge your students need to acquire, plan the LT activities that will enable them to acquire these skills and knowledge.

Keep an eye on the target—the standard—throughout this decision-making process. List the LT activities and a brief description of each next to the corresponding knowledge and skills.

• Question 4

How will the LT activities be sequenced?

Now that you have identified the LT activities for your unit, you need to place them in a logical order. Sequencing the LT activities is a process of task analysis. Think of the LT activities as building blocks. They need to be sequenced in a logical order that reflects a progression of understanding. This allows students to acquire the necessary skills and knowledge leading to the attainment of the standard.

Use the following templates to sequence the LT activities you have identified (see next sheet).

• Question 5

Are there LT activities used solely for assessment purposes?

For example:
  - Multiple-choice tests
  - Mathematical problem-solving tasks
## Classroom Planning

### Sequence Template

<table>
<thead>
<tr>
<th>standard / evidence</th>
<th>related knowledge and skills</th>
<th>LT activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sequence Template

Standard / Evidence

LT activity
related knowledge or skill(s)
standard / evidence

Standard / Evidence

LT activity
related knowledge or skill(s)
standard / evidence

Standard / Evidence

LT activity
related knowledge or skill(s)
standard / evidence
Have you identified the standard students are working to attain and that will be assessed?

Using the standard as a target, have you clearly identified what it is you want your students to know and/or be able to do?

Do the selected LT activities provide sufficient opportunities for students to acquire specific skills and knowledge they will need to be successful?

Do the LT activities follow a logical progression of learning? Are there any undesirable gaps or overlaps?

Are the LT activities developmentally appropriate for the students who will carry them out?

Do the LT activities accommodate a range of learning styles and multiple intelligences?
Key Points to Remember

- Each LT activity is aligned with one or more identified standards.
- LT activities provide students with opportunities to acquire specific knowledge or skills.
- LT activities should be planned in a sequence that reflects a logical progression of the acquisition of skills and understanding to the identified standard.
- LT activities are developmentally appropriate and accommodate a wide range of learning styles and multiple intelligences.
Classroom Assessment is divided into two parts.

Part I: The Assessment Plan.
Part II: Scoring Guides.
In this section you will:

• Learn what is meant by classroom-based assessment

• Learn how assessment is used in the classroom

• Learn the characteristics of effective assessments
1) **What is meant by assessment?**

Assessment is much more than tests, rubrics, and giving grades! Assessment is an integral part of instruction. It is the process of quantifying, describing, gathering data about, or giving feedback about performance.

Classroom assessment has many pieces. This has a tendency to make the notion of assessment overwhelming at times. Classroom assessment involves pieces such as scoring guides (checklists, rubrics), constructed student responses (products, performances), development of assessment plans, alignment to standards, and multiple opportunities for students to demonstrate attainment of standards.

A summary of this information is found in the Assessment Planning Guide found on page 46.

2) **What is the purpose of assessment?**

The primary purpose of classroom assessment is to inform teaching and improve learning.

Assessment:

- Guides the process of changing and improving education
- Determines the success of individual students, specific curricula, and institutional practice
- Determines if students have integrated knowledge and skills across the curricula
- Provides methods and data to effectively communicate results

**Assessment helps identify where there might be a need to:**

- improve instructional practices for students
- focus professional development for teachers
- provide new or different instructional resources for learners
- rethink identified standards/evidence

3) **I thought assessment was used primarily to provide feedback about student learning. How can assessment provide information about teaching practices?**

While assessment is used to provide feedback about student learning, it also provides educators with valuable information about their instructional practices.

4) **What are characteristics of effective assessment?**

Effective classroom assessment is ongoing and relevant to immediate learning.

**Effective assessments are:**

**Comprehensive**
- Each component is part of a whole system
- Addresses needs of a variety of audiences
- Addresses student strengths as well as problems
- Examines results within and across curricula

**Inclusive**
- Multi-faceted, flexible
- Developmentally and culturally appropriate
- Addresses learning styles/multiple intelligences
- Involves the student in self-assessment

**Technically Sound**
- Continuous and ongoing
- Valid and reliable
- Reported accurately

**Ethical**

5) **What do standards-based assessments provide for me and my students?**

Standards-based assessments can be powerful tools for both students and teachers. The standards set clear targets and expectations for students, teachers, and parents.
When planning for assessment, it is important to first consider the bigger picture. This means developing an assessment plan. Within a unit of study, you want to be certain that there are multiple opportunities for students to demonstrate attainment of standards and multiple measures providing feedback on student learning.

In this section you will:

- Look at an example of an assessment plan
- Learn the importance of an assessment plan
- Learn the components of an assessment plan
- Have an opportunity to design an assessment plan
- Look at the Assessment Planning Guide
Assessment Plan

Background Information

1) **What is an assessment plan?**
An assessment plan is a design tool. It is a set of choices regarding how student learning will be assessed in relation to the standards, evidence and criteria identified.

2) **I already have assessments for my unit. Should I have an assessment plan?**
An assessment plan is an important part of effective classroom assessment. Although you may be using standards-based assessments, using an assessment plan will ensure that:

   • The feedback from the implementation of an assessment plan guides the process of changing and improving instruction.
   • There will be multiple opportunities for a student to demonstrate attainment of an identified standard.
   • Students will produce a variety of constructed responses such as: products (written report, diorama, map) and performances (orienteering course, interview, play). This recognizes multiple intelligences and individual student strengths. Selected responses may also be used.
   • A variety of scoring guides will be used to provide feedback on student learning, the assessment results will be reported.

3) **Should I start with the assessment plan or my individual assessments?**
By starting with the assessment plan, you see the bigger picture. This allows you to make choices that ensure that opportunities to demonstrate attainment of standards are not limited to a single kind of product or scoring guide. It also makes certain that students have multiple opportunities to demonstrate attainment of identified standards. On the other hand, you might start with current assessments and build around them to develop the assessment plan. You can build in either direction so long as you end up with a complete design tool.

4) **What are the components of a classroom assessment plan?**
(Refer to Assessment Planning Guide on page 45)
A classroom assessment plan includes:

   • Identified standards. (This should include all the standards that are the focus of the unit.)
   • Identified LT activities or experiences aligned with standards (such as creating a response journal).
   • Identified sources of evidence by which students will demonstrate attainment of the standard. These include constructed responses the student produces such as: short answer, products (example: written report, mobile), performances (example: skit, performing an experiment, designing a pulley system), or selected responses (example: multiple choice, true-false test).
   • Identified scoring guides used to assess the student product or performance as one of the following: answer key (AK), checklist (CL), generalized rubric (GR), task-specific rubric (TSR), or observation sheet (OS).

5) **Should I always be the person assessing student learning?**
• The teacher does not have to be the assessor. Learning can also be assessed by peers, self, expert judges, parents, and community members.

6) **What reporting/feedback methods can I use?**
• Reporting and feedback methods include: Numerical Scores, Narrative Reports, Scoring Guides, Written Comments, Verbal Report / Conference.
## Example of an Assessment Plan

<table>
<thead>
<tr>
<th>Standards / Evidence</th>
<th>Instructional or Assessment Activity</th>
<th>What the Student Produces</th>
<th>Type of Scoring Guide Used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Short Answer</td>
<td>Product</td>
</tr>
<tr>
<td>7.1 aa, bb, cc</td>
<td>Cubes to Steam</td>
<td>written report</td>
<td>graph</td>
</tr>
<tr>
<td>7.12 b, aa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.12 aa</td>
<td>Density Investigation</td>
<td>written report</td>
<td></td>
</tr>
<tr>
<td>7.12 aa, bb</td>
<td>Seltzer Bottles</td>
<td>lab report</td>
<td></td>
</tr>
<tr>
<td>7.1 bb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 aa, bb, cc</td>
<td>Falling Bodies</td>
<td>lab report</td>
<td></td>
</tr>
<tr>
<td>7.1 bb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 bb, cc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 bb, cc, dd</td>
<td>Motion Centers</td>
<td>lab report</td>
<td></td>
</tr>
<tr>
<td>7.12 dd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.12 dd, 1.5 cd</td>
<td>Marble Roll Balloon Rockets</td>
<td>graph and lab report</td>
<td>perform experiment</td>
</tr>
<tr>
<td>7.12 aa, 1.5 cd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 aa, cc, dd</td>
<td>Is Air Matter?</td>
<td>perform experiment</td>
<td></td>
</tr>
<tr>
<td>7.12 aa, dd</td>
<td>Scientifically Speaking</td>
<td>poster</td>
<td>perform experiment</td>
</tr>
<tr>
<td>1.5 c,d</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This Assessment Planning Guide provides you with valuable information, definitions, and examples related to assessments and assessment plans. Take the time to read this through carefully. Refer to this information when creating your own assessment plan for your standards-based unit.

### What the Student Produces

<table>
<thead>
<tr>
<th>Selected Response</th>
<th>Constructed Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td><strong>Short Answers</strong></td>
</tr>
<tr>
<td>Items in which the student selects from among responses or answer choices that are presented to him/her</td>
<td>Items for which the student must create his/her response or answer</td>
</tr>
<tr>
<td><strong>Examples</strong></td>
<td><strong>Products</strong></td>
</tr>
<tr>
<td>Multiple Choice</td>
<td>Documents or artifacts created by students</td>
</tr>
<tr>
<td>True-False</td>
<td></td>
</tr>
<tr>
<td>Matching</td>
<td></td>
</tr>
<tr>
<td>Fill in the blank: word(s), phrase(s). Short Answer: sentence(s), paragraph(s) Label a diagram, “show your work” Visual representation: web, concept map, flow chart, graph/table</td>
<td>Essay, research paper, log/journal, lab report, story/play, poem, portfolio, art exhibit, science project, model, video/audio tape, spreadsheet, learning log</td>
</tr>
<tr>
<td><strong>How the assessment is created and used</strong></td>
<td><strong>Performances</strong></td>
</tr>
<tr>
<td>Identifies standards and criteria to be assessed Selects or creates items Pilots and refines items Creates and uses scoring guide(s)</td>
<td>Identifies standards and criteria to be assessed Selects or created items Pilots and refines items Creates and uses scoring guide(s)</td>
</tr>
<tr>
<td><strong>Scoring Guides</strong></td>
<td><strong>Generalized Rubric</strong></td>
</tr>
<tr>
<td>Answer Key</td>
<td>Generalized Rubric Checkpoint Answer Key</td>
</tr>
<tr>
<td>Scoring Template Machine Scoring</td>
<td>Task-specificRubric Checklist Answer Key</td>
</tr>
<tr>
<td><strong>Reporting / Feedback Methods</strong></td>
<td><strong>Task-specific Rubric Checklist Observation Sheet</strong></td>
</tr>
<tr>
<td>Numerical Score: percentages, point totals</td>
<td>Verbal report / conference</td>
</tr>
<tr>
<td>Narrative report (written) Checklist Written comments</td>
<td></td>
</tr>
<tr>
<td><strong>Assessor(s)</strong></td>
<td><strong>Letter Grades</strong></td>
</tr>
<tr>
<td>Self</td>
<td>Teacher(s)</td>
</tr>
<tr>
<td>Teacher(s)</td>
<td>Peer(s)</td>
</tr>
<tr>
<td>Peer(s)</td>
<td>Parent(s)</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>Expert Judges</td>
</tr>
<tr>
<td>Expert Judges</td>
<td>Community Members</td>
</tr>
</tbody>
</table>

Adapted from McTighe and Ferrara
Critical Questions About Creating an Assessment Plan

An assessment includes the assessment activity, what the student produces, and the scoring guide. Using the Assessment Planning Guide Template found on the following page and the following guiding questions, design an assessment plan for a unit of study. Another copy of the Assessment Planning Guide Template can be found in Appendix A (page 81).

• Question 1:
  What are the standards to which the activities are aligned?

List the standards to which the LT activities are aligned in the designated boxes in the first column under the heading:

Standards/Evidence

• Question 2:
  What will your instructional and assessment activities be?

List these LT activities in the boxes of the second column under the heading:

Instructional or Assessment Activity

Several LT activities may be aligned with the same standard.

• Question 3:
  For each LT activity, what kind of response does the student produce?

Record this in the appropriate boxes under the main heading: What the Student Produces

The subheadings include:

Selected Response
  Student selects from responses presented to him/her (as in a multiple-choice test)

Constructed Response
  • short answer: student provides the response or answer
  • product: the student produces a product such as a diorama, journal, essay, painting
  • performance: an interview, a play, a presentation

• Question 4:
  Which type of scoring guide(s) is most appropriate for each assessment?

Check the corresponding box under the heading:

Type of Scoring Guide Used

• Question 5:
  What will the reporting / feedback method be?

Refer to the assessment planning guide for examples on page 46.

• Question 6:
  Who will be the assessor?

Refer to the assessment planning guide for examples.
### Assessment Planning Guide Template

<table>
<thead>
<tr>
<th>Standards / Evidence</th>
<th>Instructional or Assessment Activity</th>
<th>What the Student Produces</th>
<th>Type of Scoring Guide Used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Selected Response</td>
<td>Answer Key</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Constructed Responses</td>
<td>Check List</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short Answer</td>
<td>GR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Product</td>
<td>TSR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance</td>
<td>OS</td>
</tr>
</tbody>
</table>

**What the Student Produces**

- Selected Response
  - Short Answer
  - Product
  - Performance

**Type of Scoring Guide Used**

- Answer Key
- Check List
- GR
- TSR
- OS
Self-Assessment

- Have you included all the standards that are the focus of the unit?
- Have you included LT activities or experiences that provide multiple opportunities for students to demonstrate attainment of the standards?
- Are there a variety of responses that the student produces in your plan?
- Does your plan include a variety of scoring guides to provide feedback on student learning and instruction?
- Are there multiple measures to provide feedback on student learning?
Assessment Plan

Key Points to Remember

• Assessment is an essential element of standards-based learning experiences and units of study.

• An assessment plan documents your choices regarding how student learning will be assessed in relation to the identified standard and evidence.

• The standards set clear targets and expectations for students, teachers, and parents. Students improve their ability to monitor their own work and assess their progress. Products and performances provide an ongoing, cumulative data source for measuring progress over time.

• Within a unit of study, there should be multiple opportunities for a student to demonstrate attainment of an identified standard through a variety of constructed responses and products.

• An assessment plan should include multiple measures to provide feedback on student learning.
Part Two: Scoring Guides

Finally, it is time to look at individual scoring guides. In this section you will learn what to consider when selecting scoring guides.

In this section you will:

• Learn about different kinds of scoring guides
• Learn how to choose the appropriate scoring guide
• Look at examples of scoring guides
• Learn how to design a rubric
Scoring Guides

Background Information

1) **What does standards-based assessment involve?**
   Standards-based assessment involves:
   • tying assessment methods directly to the standards students are expected to attain
   • using multiple assessment strategies to gain information and provide feedback about student learning

2) **How are scoring guides used?**
   Scoring guides are used to determine where a student is in relation to the standard. Examples of scoring guides include checklists, generalized and task-specific rubrics, answer keys, and scoring templates.

3) **What is a rubric?**
   A rubric is an established set of parameters for scoring student performance. It includes a fixed measurement scale, a set of clear criteria, and performance descriptions for each criterion at each point on the scale.

4) **What is the difference between generalized and task-specific rubrics?**
   **Generalized Rubric** - a rubric that can be used for a wide range of products and performances and multiple tasks to which the same criteria can be applied. For example, generalized rubrics are often used to assess standards for problem solving, communication, and scientific method.

   **Task-Specific Rubric** - Some tasks require a set of scoring guidelines specific to a particular task. The criteria are addressed and described in terms of specific content, processes, or skills.

   There are some disadvantages to task-specific rubrics. They take time to create and yet their use is limited to the specific task. Another disadvantage is that students must relearn expectations for each task.

5) **Is a rubric the best scoring guide to use?**
   Rubrics are powerful ways to communicate standards-based performance. However, these are not always the most appropriate assessment to use. Sometimes other forms of assessment (checklists, observation sheets, answer keys) may be more efficient and appropriate to use.

6) **How do I know what scoring guide to use?**
   • Use common sense. Use a checklist when you need to measure yes or no, present or absent criteria. Checklists are effective in measuring specific characteristics. For example, does a graph have a title?

   • Rubrics are very valuable when you wish to score a student’s performance or product. Clear criteria and performance descriptors for each criterion at each point on the scale provide clear communication about student learning and the attainment of standards.

   • Observation sheets are used to record what is observed in relation to particular criteria taken from standards.

7) **What are standards-based criteria?**
   • Criteria specify the dimensions or characteristics of standards used to judge student work. When combined with a scale and performance descriptions, these elements we value in student performance become rubrics or scoring guides to be used for assessment.

   • Criteria should be clear, tie directly to standards, and be written in language easily understood by students and parents.
8) **How do I decide what the criteria will be?**
   - The criteria for a scoring guide are tied to the standard. The wording for the criteria often comes directly from the standard itself or the evidence for the identified standard.

9) **How do I know if my assessments are aligned with the Vermont Standards?**
   The Checklist for Selection of Assessments aligned with Vermont Standards is found on page 62.
Examples of Scoring Guides

I am including examples of three different scoring guides used in my physics unit: a checklist, a task-specific rubric, and a generalized rubric.

Example of a Checklist

The following checklist is the scoring guide used to assess the graph students produce from the data they have collected through observation and experimentation during the Cubes to Steam Investigation. This checklist is intended for both student and teacher use.

Students use their recorded data and observations from the experiment to make this graph. This checklist is aligned with Standards:

7.1 bb Scientific Method
Students use scientific methods to describe, investigate, and explain phenomena:
This is evident when students:
bb. Seek, record, and use information from reliable sources, including scientific knowledge, observation, and experimentation

1.17 Notation and Representation
Students interpret and communicate using mathematical, scientific, and technological notation and representation.
This is evident when students:
aa. Appropriately represent data and results in multiple ways (e.g., numbers and statistics, drawings and pictures, sentences, charts, tables, equations, simple algebraic equations)

Checklist for graph in Cubes to Steam Experiment:
In your graph, did you:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>❑</td>
<td>❑</td>
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<tr>
<td>❑</td>
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<tr>
<td></td>
<td>❑</td>
</tr>
<tr>
<td></td>
<td>❑</td>
</tr>
</tbody>
</table>
Example of a Task-Specific Rubric

Is Air Matter?
In this activity, students must utilize scientific methods and their understanding of the characteristic properties of matter to design and perform an experiment that demonstrates that air is matter. Students must apply their understanding of the properties of air to a real-world situation. They are assessed on their knowledge of the properties and composition of air and matter, their ability to design and experiment to test the hypothesis, their ability to observe and measure characteristic properties of matter and their ability to apply their understanding of these properties to a real-world situation.

Standards being assessed:

**7.1** Students use scientific methods to describe, investigate, and explain phenomena

**7.12** Students understand forces and motion, the properties and composition of matter, and energy sources and transformations

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Just Starting</th>
<th>Getting There</th>
<th>Got It!</th>
<th>Wow</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 cc</td>
<td>experiment design is flawed or does not demonstrate air has weight</td>
<td>design begins to demonstrate air has weight but is not conclusive</td>
<td>design demonstrates air has weight</td>
<td>design is sophisticated and/or provides multiple ways to demonstrate air has weight</td>
</tr>
<tr>
<td>7.1 cc</td>
<td>designs experiment to test hypothesis</td>
<td>design is flawed or does not demonstrate air occupies space</td>
<td>design demonstrates air occupies space</td>
<td>design is sophisticated or provides multiple ways to demonstrate air occupies space</td>
</tr>
<tr>
<td>7.12 aa</td>
<td>observes properties of air w/o linking to characteristics of matter or misidentifies</td>
<td>observes properties of air but link to characteristics of matter is not clear</td>
<td>observes properties of air and links to properties of matter</td>
<td>observes properties of air, explains why they are properties of matter</td>
</tr>
<tr>
<td>7.12 aa 7.1bb</td>
<td>measurement of properties of air inaccurate</td>
<td>measures properties of air but accuracy lacking or units inappropriate</td>
<td>accurately measures properties of air using correct units</td>
<td>sophisticated measurement of properties of air</td>
</tr>
<tr>
<td></td>
<td>applies understanding of properties of air to real-world situation</td>
<td>application to real world demonstrates some understanding of properties of air</td>
<td>accurately applies understanding of properties of air to real world</td>
<td>applies sophisticated understanding of properties of air to real world</td>
</tr>
</tbody>
</table>

Scoring Guides
**Example of a Generalized Rubric**

**Scientifically Speaking**

In this activity, students use verbal skills to express themselves effectively to an audience while engaging the audience in the presentation. Students perform an experiment and explain the use of scientific methods in design, collecting and analyzing data, and drawing conclusions. They are assessed on their presentation skills, their ability to perform the experiment successfully and collect data, and their effective use of scientific methods.

Standards being assessed:

- **7.1** Students use scientific methods to describe, investigate, and explain phenomena
- **1.15** Students use verbal and nonverbal skills to express themselves effectively.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Just Starting</th>
<th>Getting There</th>
<th>Got It!</th>
<th>Wow</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 bb</td>
<td>is unable to perform experiment</td>
<td>has some difficulty when performing experiment or in collecting data</td>
<td>performs experiment successfully and collects data</td>
<td>performs experiment successfully, collects data in sophisticated manner</td>
</tr>
<tr>
<td>7.1 aa,cc,dd</td>
<td>use of scientific methods not effective to test hypothesis</td>
<td>use of scientific methods somewhat effective to test hypothesis</td>
<td>uses scientific methods effectively to test hypothesis</td>
<td>effective use of scientific methods to test hypothesis and applies to real world</td>
</tr>
<tr>
<td>1.15 c</td>
<td>shows little awareness of audience and makes no adjustments</td>
<td>shows some awareness of audience in planning and makes some adjustments to reaction</td>
<td>shows clear awareness of audience by planning and adjusting to its reaction</td>
<td>clearly plans for audience, involves audience, and adjusts to its reaction</td>
</tr>
<tr>
<td>1.15 d</td>
<td>verbal skills are ineffective, presentation difficult to follow</td>
<td>verbal skills are somewhat effective, can follow most of presentation</td>
<td>makes effective use of verbal skills, presentation easy to follow</td>
<td>presentation skills effective, presentation smooth and sophisticated</td>
</tr>
</tbody>
</table>
Critical Questions about Scoring Guides

Use the following Critical Questions to help guide you as you develop and plan for your individual scoring guides.

**Question 1:**

How do you select a scoring guide?

Decide what it is you are assessing. Based upon the standard(s) selected and the learning-teaching activities you are using, try to use common sense to choose a scoring guide. It should be appropriate for the student response and the feedback you desire.

*For example:*

- If the student produces a selected response, use an answer key.
- If you are measuring yes or no, or present or absent, use a checklist.
- If you are assessing a performance in relation to particular criteria, use a performance sheet or rubric.
- If there is a range of proficiency in relation to criteria drawn from identified standards, use a rubric.

**Question 2:**

How do you select criteria?

Criteria specify the dimensions or characteristics of standards used to judge student work. Criteria should be clear, tie directly to standards, and be written in language easily understood by students and parents.

The criteria often come directly from the wording of the standard itself or from the evidence for the identified standard.

*For example:*

- If the standard is... Students select **appropriate technologies** and applications to solve problems and to communicate with an audience through **graphics, text, data, sound, and movement.**
- The criteria could be... Selecting technologies Applying technologies Using graphics, text, data, sound, and movement
- If the standard is... Students select **appropriate technologies** and applications to solve problems and to communicate with an audience through **graphics, text, data, sound, and movement.**
- The criteria would NOT be... Turning on a computer Neatness Keyboarding skills Revision

**Question 3:**

Who will the assessor be?

Decide who the assessor will be: self, teacher, peer, expert judges, parents, community members

**Question 4:**

What reporting/feedback method will you use?

Decide the reporting/feedback method: checklist, numerical score, narrative report, rating scale, rubric, written comments, conference/verbal report, letter grades
Critical Questions About Scoring Guides

Question 5:

How do you create your own rubric?

Develop your own rubric using the “Rubric Template” and guidelines that follow.

Nine Steps for Developing a Rubric:

1. Make sure that you are clear about the standard and the related process, activity, task, or product you want to assess.

2. Decide on the criteria for success.
   - Key words and phrases from standards
   - The importance for students
   - The aspects that will be most powerful to highlight in order to increase performance
   - Involve students when possible

3. List the criteria. The wording often comes directly from the standard itself or the evidence of the identified standard.

4. For each criterion, decide the point on the scale that meets the standard. Write a performance description for this proficient level: what does it look like when the criterion has been reached?

5. Write a performance description for the other remaining points on the scale.

6. Determine if your criteria will be weighted and what the weighting will be.

7. Pilot the rubric.

8. Revise and use, making sure that the rubric is posted prominently, is used by the students, and is revised as needed.

9. Collect exemplars of student work and modify the rubric as necessary.

* You can also begin with step 9.
  (adapted from Sue Biggam)
Rubric Template

Standard and Evidence:

<table>
<thead>
<tr>
<th>Scale / Criteria</th>
<th>Just Starting</th>
<th>Getting There</th>
<th>Got It!</th>
<th>Wow!</th>
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</table>
Self Assessment

- Is your assessment aligned with an identified standard?

- Given the LT activity you are assessing and what it is you wish to measure, have you chosen an appropriate scoring guide?

- If you are using a rubric, are your criteria clear and written in language easily understood by students and parents, and do the criteria tie directly to standards and evidence?

- In your unit of study, have you used a variety of scoring guides appropriate for the knowledge and skills being assessed?
Scoring Guides

Key Points

- **Standards-based assessment** involves tying assessment methods directly to the standards students are expected to attain and using multiple assessment strategies to gain information and provide feedback about student learning.

- **Scoring guides** are used to determine where a student is in relation to the standard. Examples of scoring guides include checklists, generalized and task-specific rubrics, answer keys, scoring templates, and observation sheets.

- **Rubrics** are powerful ways to communicate standards-based performance. However, these are not always the most appropriate assessments to use. Sometimes other forms of assessment may be more efficient and appropriate. Use a rubric when you wish to score a student’s performance or product for a range of proficiency in relation to criteria drawn from identified standards.

- **Use a checklist** when you need to measure yes or no, present or absent criteria.

- **Use an observation sheet** for performances to record what is observed in relation to particular criteria taken from standards.
Checklist for Selection of Assessments


Note: This checklist can be used to be used for two purposes. First, it will serve as a tool for initial consideration of assessments to be included in a resource bank being developed by the Vermont Curriculum Consortium. Second, it may be used by local educators in making assessment decisions.

All items may not be applicable for all uses.
The tool is intended to provide a profile of an assessment tool in relation to Vermont standards. A single "No" response would not, in most cases, remove a tool from consideration.

Consequences

☐ NA ☐ Yes ☐ No Given the intended purpose and audience, is the assessment worth the instructional time?

☐ NA ☐ Yes ☐ No Does the assessment encourage good instruction as defined by Vermont's Learning Opportunities?

☐ NA ☐ Yes ☐ No Does the assessment support a broad curricular focus?

☐ NA ☐ Yes ☐ No Does the assessment provide exemplars appropriate to the level being tested?

Fairness

☐ NA ☐ Yes ☐ No Does the assessment provide ample time for students to complete so that results reflect capability rather than test-taking skill?

☐ NA ☐ Yes ☐ No Does the assessment tap the knowledge and skills students have had an adequate opportunity to acquire during classroom instruction?

☐ NA ☐ Yes ☐ No Is the assessment free of cultural, ethnic, and gender stereotypes?

☐ NA ☐ Yes ☐ No Is the assessment free of tasks or situations more familiar to students of one background or gender than another?

☐ NA ☐ Yes ☐ No Does the assessment use a scoring process applied without bias?
Assessment Checklist

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Does the assessment avoid unnecessarily difficult language when assessing content from the standards?</td>
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<tr>
<td>Does the assessment enable all students to demonstrate what they know and can do in the areas being assessed?</td>
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<td>Can necessary accommodations be used?</td>
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</tbody>
</table>

**Reliability and Validity**

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<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Does the assessment describe the Vermont Standard(s) it intends to assess?</td>
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<tr>
<td>Does the assessment represent the intended Vermont Standard(s); that is, does the assessment include a range of important, significant instances of targeted knowledge and skills?</td>
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<tr>
<td>Does the assessment provide evidence that the results are generalizable - are indicative of student performance in a broader domain of knowledge?</td>
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<tr>
<td>Does the assessment design include consideration of the number of tasks a student must complete in order to yield generalizable results?</td>
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<td>Does the assessment include explicit criteria for scoring, and preferably a guide describing the application of these criteria?</td>
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<tr>
<td>Does the assessment provide evidence that results are consistent across raters and across scoring occasions?</td>
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</table>

**Cognitive Complexity**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Does the assessment use tasks for which students can be expected to have adequate background knowledge?</td>
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<tr>
<td>For tasks assessing thinking and problem-solving skills, does the assessment pose problems for which students have no prior exposure to the specific tasks used in the assessment?</td>
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<tr>
<td>Does the assessment use tasks whose solutions cannot be memorized in advance?</td>
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<tr>
<td>Does the assessment provide evidence that tasks elicit complex understanding or problem-solving skills?</td>
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</tbody>
</table>

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Assessment Checklist

Content Quality and Coverage

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Does the assessment assess key concepts and principles from the Vermont standards?

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Does the assessment avoid irrelevant information?

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Does the assessment use tasks consistent with the Vermont Learning Opportunities?

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Has the assessment been reviewed by content experts to ensure quality, accuracy, and disciplinary / interdisciplinary appropriateness of tasks?

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Does the assessment format reflect classroom practice?

Meaningfulness

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Does the assessment provide useful information for students, parents, and/or teachers?

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Is the assessment credible to teachers, students, parents, and the public as a valid indicator of student competence in the particular assessment area?

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Does the assessment engage and motivate students to do their best?

Cost and Efficiency

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Is the assessment administratively feasible?

☐ [ ] [ ] [ ] NA [ ] [ ] [ ] Yes [ ] [ ] [ ] No
Is the assessment cost-efficient?
Using Vermont’s Learning Opportunities for Instruction in the Design of Activities

Vermont’s Learning Opportunities provide excellent guidance for the design of effective instruction. Too, certain instructional strategies are better suited to certain types of learning contained in the standards. This section includes information abstracted from research and best practices from sources that provide high-quality professional development opportunities for instruction.

In this section you will:

• Expand your repertoire of instructional strategies

• Learn to select instructional strategies based on their efficacy in supporting student learning in relation to identified standards

• Learn a decision-making system to design and implement standards-based curriculum reflecting Vermont’s Learning Opportunities for Instruction
Learning Opportunities

Background Information

1) What are learning opportunities?

The learning opportunities in Vermont’s Framework of Standards and Learning Opportunities are recommended practices to support all students in attaining the standards in the Framework. They address five areas: access, instruction, assessment, connections, and best practices in the fields of knowledge. To achieve the high standards presented in Vermont’s Framework, every student needs these opportunities. The learning opportunities are specific, they represent areas that can be influenced by the teacher, and they are supported by current research and best practices.

2) In the Learning Opportunities, what are the recommended practices for instruction?

Five learning opportunities in the area of instruction are presented in Vermont’s Framework of Standards and Learning Opportunities, as shown below.

B.1 Acquiring Knowledge and Skills:
Learning experiences that engage students in active learning, build on prior knowledge and experiences, and develop conceptual and procedural understanding, along with student independence.

B.2 Variety of Instructor Roles:
Teachers who use a variety of teaching roles (e.g., direct instruction, facilitating, modeling, coaching, reflecting, guiding, and observing), and adapt these as appropriate for different purposes of instruction and student needs.

B.3 Multiple Student Roles:
Opportunities to learn through a variety of roles (e.g., planner, questioner, artist, scientist, historian), alone and with others.

B.4 Application and Reflection:
Projects and assignments that require students to integrate and apply their learning in meaningful contexts, and to reflect on what they have learned.

B.5 Adaptive Learning Environments:
Learning environments that are adapted so that all students achieve success.

3) How can I design my instruction so it will be most effective in helping my students acquire standards and reflect Vermont’s Learning Opportunities for Instruction?

In a standards-based system, the design of instruction involves a series of decisions about the roles of student and teacher, the adaptations needed in the learning environment, and the instructional strategies that will be most effective in helping students to acquire, extend, and apply the knowledge, skills, and dispositions in the standards.

The making of these decisions is a recursive, interactive process. While there is no set order, some decisions may logically come earlier than others in the planning process.

For example, students need first to acquire skills they will then be expected to apply. A question may be revisited at any time during the planning process. In this process, the following questions are addressed:

Question 1:
What instructional strategies will best help students acquire the type of desired learning (content/concepts, skills/processes, or dispositions) from the identified standards?

Question 2:
How will students be helped to extend and refine their learning?

Question 3:
How will students be helped to integrate and apply their learning in meaningful contexts, and to reflect on what they have learned?
Question 4: What will be the instructors’ and students’ roles?

Question 5: How does the learning environment need to be adapted to ensure the success of all students?

In the next section, Critical Questions, these steps are presented in detail, with information for each about strategies and approaches to consider during the planning and implementation process.

The material included is based on the following resources, which are subsequently referred to throughout the text:

- Vermont’s Framework of Standards and Learning Opportunities (VFSLO)
- Models of Teaching (MOT)
- Dimensions of Learning from ASCD (DOL)
- Multiple Intelligences in the Classroom (MIC)
- Skillful Teacher (ST)

These resources are highly recommended to those who wish for additional information, examples, and professional development experiences related to the strategies described in this document.

This template may be used to fill in instructional strategies in the five different areas.

<table>
<thead>
<tr>
<th>Acquiring Concepts and Skills</th>
<th>Extend and Refine</th>
<th>Integrate and Apply</th>
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Roles and Responsibilities

Learning Environments
Learning Opportunities

Question 1:

What instructional strategies are possible/effective to help students acquire the type of desired learning (content/concepts, skills/processes, dispositions) given the identified standards?

(VFSLO Learning Opportunity B.1)

For different instructional approaches to be used effectively in the classroom, it is important to clarify which standards are the focus of instruction and assessment AND to determine whether the learning involved focuses predominantly on content/concepts, skills/processes, and/or dispositions.

As shown below, particular instructional strategies are known to be more effective for acquiring identified types of learning.

Appendix B shows which of Vermont’s standards are composed predominantly of concepts/content, which are composed predominantly of processes/skills, and which are composed predominantly of dispositions.

Knowing this, one can then use this section of the guide to consider what instructional approaches might best work to help students learn in relation to these standards.

CONTENT / CONCEPTS

For standards and evidence focused primarily on content and concepts (see Appendix B), consider the following instructional strategies:

Three-Minute Pause

(DOL Dimension 2)

Every 10 –15 minutes in class ask students to do the following in three minutes:

• Summarize what they have experienced
• Identify interesting aspects of what they have experienced

Identify confusion and try to clear up.

KWL

(DOL Dimension 2)

• Before reading, listening, observing, or acting, identify what you know about the topic
• Before reading, listening, observing, or acting, identify what you want to know about the topic.
• After reading, listening, observing, or acting identify what you learned about the topic.

Concept Attainment Process

(DOL Dimension 2)

This strategy involves presenting students with clear examples and non-examples of a new concept to be learned. Through this process the concept is developed and understood.

Present examples and non-examples.

For example:

This is an example of a compound word: boyfriend.

This is not an example: boy.

This is an example: railroad.

This is not an example: car.

Through this process, students figure out and list the defining characteristics of the concepts.

• More pairs of examples and non-examples are presented so students can test their initial hypotheses about defining characteristics of the concepts.

• More pairs are presented until students are able to state the defining characteristics of the concept.

• Students identify examples and non-examples of their own.

• Students develop a written or oral description of the concept that includes key or defining characteristics.

Reciprocal Teaching Techniques

(DOL Dimension 2)

• Summarize – After students have read a small section, a single student acting as teacher summarizes what has been read. Other students

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with guidance from the teacher can add to the summary.

- **Question** — The student leader next asks some questions to which the class responds.
- **Clarify** — Student leader tries to clarify confusing points in the passage. Or the student leader might ask other students to ask clarifying questions. The group attempts to clear up confusing parts. This may involve rereading the passage.
- **Predict** — Student leader asks for predictions about what will happen in the next segment of the text. The class then reads another passage silently or aloud and a new student is selected as student leader. The student leader now summarizes the reading using the prediction questions as an aid.

**Before, During, and After**

Tell your students:

**Before**

- Identify what you know about the topic.
- List specific ideas.
- Write specific questions that you would like answered.
- Make specific predictions about what you think you will learn.

**During**

- Try to generate mental pictures about what you are experiencing.
- Occasionally summarize what you have just experienced.
- Try to answer the questions you asked.
- Determine if your predictions were correct.
- Identify things you are confused about.
- Occasionally go back and try to clear up the confusing parts.

**After**

- Create a summary of what you have learned.
- State how you can use the information you have learned.

(Model each phase and explain to students that they do not have to use every step in each phase.)

**Synectics**

- Describe the topic/concept.
- Create direct analogies.

**Learning Opportunities**

- Create personal analogies.
- Create compressed conflicts.
- Create new direct analogies.
- Reexamine original topic/concept.

**Graphic Organizers**

- Create physical or pictographic representations of information.
- Have students use organizational patterns and their graphic representations.
  1. Descriptive patterns organize facts or characteristics about specific persons, places, things, and events.
  2. Sequence patterns organize events in a specific chronological order.
  3. Process/cause patterns organize information into a causal network leading to a specific outcome or into a sequence of steps leading to a specific product.
  4. Problem/solution patterns organize information into an identified problem and its possible solutions.
  5. Generalization patterns organize information into a generalization supporting examples.
  6. Concept patterns represent a class or category, and they usually illustrate specific examples and defining characteristics of a concept.

**Cooperative Learning: Jigsaw II**

The Jigsaw II strategy improves social skills, revisits previously taught knowledge and skills, makes the acquisition of new academic content, concepts, and skills possible, and fosters positive self-esteem. Group identity and a supportive atmosphere are fostered as students depend upon one another.

- Meet in study teams to examine task.
- Work in expert groups to conduct research, discuss information, answer questions.
- Experts teach study teams what they have learned.
- Evaluate individually and provide team recognition.

**Sensory Exploration**

Experience content using a variety of senses:

**Sight:** Tell students to imagine what the information
looks like. Tell students to think of the information as a motion picture in their mind.

Smell: Tell students to imagine the smells associated with the information.

Taste: Tell students to imagine the tastes associated with the information.

Touch: Tell students to imagine the sensations of touch associated with the information.

Hearing: Tell students to imagine the sounds associated with the information.

**SKILLS / PROCESSES / PROCEDURES**

For standards focused primarily on SKILLS/PROCESSES/PROCEDURES (see Appendix B), consider the following:

**Think Aloud**

Use "thinking aloud" to demonstrate a new skill or process. For example,

a teacher might "think aloud" the organization of a science article saying such things as, "I notice that each section is highlighted by bold text in a question. The first sentence of the section gives the answer with details that follow."

**Written Steps**

Present students with a written set of steps. For example: To read a bar graph:

- Read the title of the graph. Get a sense of the information that will be in it.
- Look at the horizontal line at the bottom of the graph. Identify what is being measured on it.
- Look at the vertical line on the left side. What is being measured on it?
- Look at the scale that is used.
- For each of the items measured on the horizontal line, identify its "height" on the vertical line and interpret that height.

- Make a statement that summarizes the important information in the bar graph.

**Flow Charts**

Teach students to create flow charts. This is best done after the students have seen the skills or processes. As soon as possible after these experiences, they should start creating a visual representation of how the steps interact.

**Mental Rehearsal**

Teach students to mentally rehearse the steps involved in a skill or process.

**Variations**

- Demonstrate how students can alter skills/processes/procedures.
- Demonstrate and provide practice in the important variations of the skill or process.
- Point out common errors and pitfalls.
- Provide a variety of situations in which students can use a specific skill or process.

**Internalization**

- Help students internalize skills/processes and procedures.
- Help students set up a practice schedule —massed practice—immediately and frequently. —distributed practice—lengthening the intervals of time between practice sessions.
- Have students chart their accuracy when practicing new skills or processes.

**Charting**

Have students chart their speed when learning a new skill. This method develops fluency for skills and processes that should be learned until they become automatic.
Learning Opportunities

For standards focused primarily on DISPOSITIONS (see Appendix B), consider the following:

Self-Regulation (DOL Dimension 5)

Teach students to be aware of their own thinking and planning; to be aware of necessary resources; to be sensitive to feedback; and to evaluate the effectiveness of their actions. For example:

- **Be aware of own thinking.**
  - What am I thinking right now?
  - Is my thinking helping me or hurting me?
  - What do I want to change?
- **Make a plan.**
  - Write down what you want to accomplish.
  - Have short-term goals that help you accomplish your long-term goal.
  - Find one person or a group of people you can meet with regularly (once a week) to give you support.
- **Be aware of necessary resources.**
  - Make a list of what you need.
  - Make a list of what is available.
  - Make a list of what is not available.
  - For those things that aren’t available, identify other resources that can take their place.
- **Be sensitive to feedback.**
  - How are things going?
  - Am I getting closer to my goal or farther away from it?
  - What do I need to change?
- **Evaluate the effectiveness of your actions.**
  - What do I need to do differently next time?
  - What would I do the same?
- **Identify and pursue long-term goals.**
  - Appoint process observers to identify uses of the mental habits of self-regulation during classroom activities.

Critical Thinking (DOL Dimension 5)

- **Engage intensely in tasks even when answers and solutions are not immediately apparent.** Set a small goal you know you can accomplish, and when you have accomplished it, set another small goal. Continue until the task is complete.
- **Push the limits of your knowledge or abilities.**
  - Do it faster.
  - Make it bigger.
  - Do it more accurately.
  - Increase your score.
  - Increase your ranking.
- **Generate, trust, and maintain your own standards of evaluation.**
- **Generate new ways of viewing a situation outside the boundaries of standard conventions.** Use metaphors and analogies to help you see things in different ways.

Question 2:

How are students helped to extend and refine their learning? (VFSLO Learning Opportunity B.4)

Consider the following:

Thinking Process Steps (DOL Dimension 3)

- Introduce an essential thinking process to students.
- Present students with steps involved in the process.
Learning Opportunities

- Provide students with ways of graphically representing the process.
- Present students with teacher-constructed tasks related to the process.
- Present students with student-structured activities related to the process.
- Present students with additional process-based activities.

Thinking Processes

Apply the above steps to the following thinking processes:
- Comparison – identifying similarities and differences.
- Classification – categorizing elements according to clearly specified attributes or characteristics.
- Induction – investigating information and drawing inferences and conclusions based on that information.
- Deduction – developing arguments and specific statements from generalizations and principles including the use of syllogistic reasoning.
- Analyzing errors, including fallacies in reasoning or logic.
- Constructing support, including the development of persuasive arguments.
- Abstracting – identifying general patterns and connections.

Question 3:
How are students helped to integrate and apply their learning in meaningful contexts, and to reflect on what they have learned?

(VFSLO Learning Opportunity B.4)

Consider the following:

Simulation
- Provide overview of simulation.
- Set up scenario.
- Assign roles.
- Conduct simulation.
- Summarize events/insights.
- Relate to real world/course content.

Discussion
- Prepare questions.

Inquiry
- Cluster questions.
- Conduct discussion.
- Review the process.
- Summarize observations.

Case Study
- Present/read case.
- Analyze case.
- Present alternative solutions.
- Summarize results.

Investigation
- Select puzzling situation/observe discrepant event.
- Gather and verify data.
- Test hypotheses and formulate a theory.
- Discuss rules or effects related to the theory and consider how the theory can be verified.

Experimental Inquiry
- Provide a clear demonstration of some phenomenon (physical or psychological) in the content area or describe the phenomenon in detail.
- Ask students to explain the phenomenon, providing guidance as they do so.
- Ask students to make predictions and to identify an activity or experiment that will test their prediction.
- Provide the necessary information and resources for students to set up their experiments.
- At the conclusion of their experiments, have students review their original explanation in light of the results of the experiment.
Learning Opportunities

Role Play

- Warm up the group.
- Select participants.
- Identify scenario/problem.
- Prepare observers.
- Enact.
- Reenact.
- Discuss and evaluate.

Decision Making

- Clearly state the decision question for students.
- Clearly identify the choices or alternatives to be considered.
- Clearly identify the criteria on which the alternatives will be judged.
- Tell students to weigh the alternatives and the criteria and then make a decision based on their quantification.
- Have students explain the reasoning behind their decision.

Problem Solving

- Use teacher-structured problem-solving tasks.
- Identify a common process or situation in your content area and some aspect of that process or situation that will be constrained or some limiting condition that will be imposed.
- Clearly identify the desired goal for students.
- Clearly identify the constraint or limiting condition for students.
- Ask students to identify what the constrained element allows them to do or what the limiting condition forces them to do.
- Have students generate ways of overcoming the constraint or limiting condition.
- Provide the necessary information and resources for students to try their alternatives.
- Have students try their solutions.
- Have students evaluate the effectiveness of their solutions.

Invention

- Clearly state the purpose of the invention.
- Clearly identify the standards that the invention should meet.
- Provide students with the necessary materials and information to develop the invention.
- Tell students you want them to develop a model, sketch, or outline of the invention.

Writing-to-Learn

Writing is a means of reflecting on learning, of working through learning problems, and of clarifying and solidifying newly learned concepts and skills. A variety of writing-to-learn strategies exist, a few of which are described briefly below.

Excellent resources for additional information are Gere’s Roots in the Sawdust from the National Council of Teachers of English and Fulwiler’s The Journal Book from Heinemann Publishers.

Admit Slips - As students enter class, distribute index cards, one to each student. Ask each student to write a response to an open-ended statement, such as:

“A key point from last night’s reading is............”

“A question I have is..........”

“I don’t understand...........”

Collect cards and use as a basis for discussion/clarification/response. Admit slips are usually anonymous.

Exit Slips - To learn what students know and need to know, hand out index cards before students leave class. Ask each student to respond to an open-ended statement, such as:

“Today I learned ...........”

“..........(new concept) means/is like........”

Student responses can be written (anonymously) on an overhead before the next day’s class to share with the group as a basis for review and clarification.

Free Reading / Writing - Ask students to write continuously for a specified period of time (3 minutes, 5 minutes, etc.) to generate ideas on a given topic. Form or correctness is not a factor, it is the ideas that count.

Dialogues - Students create a dialogue between two or more persons, historical figures, or characters being studied.

Brainstorm - Collect, in writing, all ideas about a topic generated by an individual or a group.
Question 4: What are the instructors’ and students’ roles?

(VFSLO Learning Opportunities B.2 & B.3)

Instruction should be purposefully designed to create a balance among teacher-directed and student-directed activities.

One organizational strategy is to think in terms of three options for students and teachers, also referred to as the Rule of Three (Stevenson, Chris (1997). Teaching Ten to Fourteen Year Olds. NY: Addison-Wesley Pub. (page 154).

Consider the following:

<table>
<thead>
<tr>
<th>Teacher Role</th>
<th>Student Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coaching</td>
<td>LT activities and tasks about which students have no choice: These are determined by the teacher in light of knowledge about what students need to learn and understand. Students are called on to trust the teacher’s greater experience and wisdom in undertaking no-choice work.</td>
</tr>
<tr>
<td>Guiding</td>
<td>LT activities and tasks in which students make guided choices. These are composed of controlled choices. Students choose from options identified by the teacher.</td>
</tr>
<tr>
<td>Coaching</td>
<td>LT activities in which students exercise free choice. These are designed by students and can be pursued through the school and its resources.</td>
</tr>
</tbody>
</table>

Certain teacher-student configurations have advantages over others, depending on the situation and teacher’s purpose. For example, direct instruction is often useful for giving background information efficiently and for drill and practice. Complex instruction, on the other hand, is intended primarily for learning content/concepts and for acquiring dispositions and has the added advantage of equalizing access to learning and raising learning gains, especially for “low status” students. The most powerful feature associated with learning gains is on-task talking and working together. The more students talk and work together the greater their learning gains. This is a powerful and consistent finding that has been replicated in many settings, in many classrooms, over more than 20 years. “Low status” students tend to talk less and work together less. Often they’ll sit on the sidelines or listen to the group. In Complex Instruction, the teacher uses instructional strategies that help equalize status so that “low status” students gain higher status in the classroom and talk and work together more with other students, thereby increasing their learning gains. Cooperative norms and roles are taught and reinforced and teachers assign specific competences and use the multiple-ability intervention (see chart) to equalize status and increase students’ talking and working together.

Two Effective Classroom Structures are:

### Direct Instruction

- Review previously learned material
- State objectives
- Present new material
- Conduct guided practice
- Assign independent practice
- Provide periodic review and corrective feedback

(MOT)

### Complex Instruction

- Delegate Authority
  - Students are responsible for individual products
  - Groups are responsible for helping individuals
  - Teacher promotes group interaction
  - Teacher avoids "hovering"
- Establish cooperative norms and rules
  - Examples of norms are: "You have the right to ask for help. You have the duty to assist." "Help others without doing the work for them." Cooperative norms are internalized through use of specific skill builders and feedback to students.
  - Every student in the group has a role (e.g., facilitator, recorder, reporter, harmonizer). Roles rotate.
Question 5:

What approaches to classroom management contribute to a learning environment that supports student success?

(VFSLO Learning Opportunity B-.5)

Consider the following:

Connect with students.

- Talk informally with students about their interests—before, during, and after class.
- Greet students in and out of school.
- Call student by first names as they come into class.
- Be aware of and comment on important events in students’ lives.

Monitor your own attitudes.

- Before class, mentally review students. Note those with whom you anticipate having problems (academic or behavioral).
- Imagine "problem" students succeeding in positive classroom behaviors – replace your negative expectations with positive ones. This is a form of mental rehearsal.
- Consciously keep in mind your positive expectations when interacting with students.

Accept all students.

- Give eye contact to each student in all quadrants of the room.
- Arrange seating to give you clear and easy access to all students.

Respond positively to incorrect responses or lack of response.

- Dignify responses.
- Restate questions.
- Rephrase questions.

Help students develop strategies for gaining acceptance from peers in and out of school.

- Ask people you meet about themselves rather than telling them about yourself.
- Compliment people on their positive characteristics.

- Avoid reminding people about their negative qualities or about bad things that have happened to them.

Help students develop a sense of comfort.

- Frequently and systematically use activities that involve physical movement.
- Periodically take short breaks that enable students to stand up, move about, stretch.
- Set up classroom tasks that allow students to gather information on their own or in small groups using sources that are away from their desks.
- Systematically switch from activities where students must work on their own to tasks in which they must organize themselves in small groups.
- Use 2 to 5-minute exercise breaks when energy levels start to wane as a regular aspect of instructional routine.

Establish and communicate classroom rules and procedures.

- Generate clear rules and standard operating procedures for the classroom.
- Communicate rules and procedures, discussing their meaning. Provide a written list, post, role-play, or model use.
- Acknowledge changes in rules and explain reasons for exceptions.

Develop a sense of academic trust.

- Exhibit a sense of enthusiasm about material presented.
- Link classroom tasks to students’ interests and goals.
- Ask students to generate tasks that apply to their interest and goals.

Provide positive feedback.

- Attribute students’ successes to their efforts.
- Specify what students did that produced success.
- Teach students to use positive self-talk.

Use classroom meetings to address issues.

- Bring up issue or problem.
- Give examples/clarify.
- Identify consequences/norms.
- Make judgments about norms and discuss values.
- Discuss alternatives.
• Agree on which ones to follow.
• Make a public commitment.
• At a later date, assess effectiveness.

Assess and address multiple intelligences. (MIC)

Each person possesses all eight intelligences, and most people can develop each intelligence to an adequate level of competency. Students need opportunities to learn and to demonstrate their learning in areas of intelligence that are strengths for them.

• Linguistic intelligence - refers to an individual’s capacity to use language effectively as a vehicle of expression and communication.
  (Examples: storytelling, brainstorming, tape recording, journal writing, publishing.)

• Logical-Mathematical intelligence - refers to an individual’s capacity to think logically, use numbers effectively, solve problems scientifically, and discern relationships and patterns between concepts and things.
  (Examples: calculations and qualifications, classification and categorization, Socratic questioning, heuristics, and scientific thinking.)

• Spatial intelligence - refers to the capacity to think visually and orient oneself spatially. In addition, spatially intelligent people are able to graphically represent their visual and spatial ideas.
  (Examples: visualization, color cues, picture metaphors, idea sketching, graphic symbols.)

• Musical intelligence - refers to the capacity to appreciate a variety of musical forms in addition to using music as a vehicle of expression. Musically intelligent people are sensitive to rhythm, melody, and pitch.
  (Examples: rhythms, raps, songs, chants, musical concepts, mood music.)

• Bodily-Kinesthetic intelligence - refers to the capacity to use one’s own body skillfully as a means of expression or to work skillfully to create or manipulate objects.
  (Examples: classroom theater, hands-on thinking, body maps.)

• Interpersonal intelligence - refers to the capacity to appropriately and effectively respond to other people and understand their feelings.
  (Examples: peer sharing, cooperative groups, board games, simulations.)

• Intrapersonal intelligence - refers to the capacity to accurately know one’s self, including knowledge of one’s own strengths, motivations, goals, and feelings.
  (Examples: one-minute reflection periods, choice time, goal-setting sessions.)

• Naturalist intelligence - refers to the fascination with the immense variety of the world’s animal and plant species and the talent to assign them to new or established taxa.
  (Examples: classification of plants and animals in a specific ecosystem such as wetland or salt marsh.)

Use a resolution of conflict strategy. (MOT)

• List facts pertinent to the conflict.
• Make inferences about how the persons involved were feeling.
• Propose and defend own resolution in light of those feelings.
• Describe similar experiences.
• Describe feelings of each participant in those situations.
• Look at other ways of handling the situation.

Use a variety of types of questions.

Bloom's Taxonomy is a comprehensive, hierarchical model of questioning.

Knowledge questions require students to recall or recognize information (e.g., recall, recognize, define, identify, who? what? where? when? etc.)
Comprehension questions require a student to organize previously learned material so that he or she can rephrase it, describe it in his or her own words, and use it for making comparisons (e.g., describe, compare, illustrate, explain, rephrase, contrast, etc.).

Application questions ask students to use previously learned information to solve a problem (e.g., apply, classify, choose, use, employ, solve, select, etc.).

Analysis questions ask students to identify reasons, causes, and motives; to consider available evidence in order to reach a conclusion, inference, or generalization; to analyze a conclusion, inference, or generalization to find supporting evidence (e.g., analyze, conclude, infer, distinguish, deduce, detect, etc.).

Synthesis questions require students to produce original communications, make predictions, and solve problems (e.g., solve, predict, write, draw, construct, originate, propose, design, etc.).

Evaluation questions ask students to judge the merits of an idea, a solution to a problem, or an aesthetic work (e.g., judge, argue, decide, appraise, evaluate, what is your opinion? etc.).
## Sequence Template

<table>
<thead>
<tr>
<th>standard / evidence</th>
<th>related knowledge and skills</th>
<th>activity</th>
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<tbody>
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</table>
Sequence Template

Standard / Evidence

LT activity
related knowledge or skill (s)
standard / evidence

Standard / Evidence

LT activity
related knowledge or skill (s)
standard / evidence

Standard / Evidence

LT activity
related knowledge or skill (s)
standard / evidence
### Assessment Planning Guide Template

<table>
<thead>
<tr>
<th>Standards / Evidence</th>
<th>Instructional or Assessment Activity</th>
<th>Selected Response</th>
<th>Constructed Responses</th>
<th>Short Answer</th>
<th>Product</th>
<th>Performance</th>
<th>Type of Scoring Guide Used</th>
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**Appendix A**
# Appendix A

## Rubric Template

**Standard and Evidence:**

<table>
<thead>
<tr>
<th>Scale / Criteria</th>
<th>Just Starting</th>
<th>Getting There</th>
<th>Got It!</th>
<th>Wow!</th>
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## Rubric Template

**Standard and Evidence:**

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Particular types of instructional strategies are known to be more effective for acquiring identified types of learning—content/concepts, skills/processes, or dispositions. These are described on pages 66 to 78 of this document. As an aid to teachers, Vermont’s standards are coded below to indicate whether they focus predominantly on content/concepts, skills/processes, or dispositions. A caution is in order, however: Vermont’s standards focus on higher-order learning. For example, standard 7.11 reads *Students analyze and understand living and non-living systems (e.g., biological, chemical, electrical, mechanical, optical) as collections of interrelated parts and interconnected systems.* In this standard, analysis and understanding are thinking skills, while living and non-living systems have particular content/concepts associated with them that must be acquired by students. It is important to bear these in mind and use informed judgment to select instructional strategies and design learning, teaching, and assessment activities.

**Communications Standards**

**READING**

**Reading Strategies**

1.1 Students use a variety of strategies to help them read.

**Reading Accuracy**

1.2 Students read grade-appropriate material, with 90%+ accuracy, in a way that makes meaning clear.

**Reading Comprehension**

1.3 Students read for meaning, demonstrating both initial understanding and personal response to what is read.

1.4 Students comprehend and respond to a range of media, images, and text (e.g., poetry, narrative, information, technical) for a variety of purposes (e.g., reading for pleasure as well as reading to develop understanding and expertise).

**WRITING**

**Writing Dimensions**

1.5 Students draft, revise, edit, and critique written products so that final drafts are appropriate in terms of the following dimensions:

- **Purpose** - Intent is established and maintained within a given piece of writing.
- **Organization** - The writing demonstrates order and coherence.
- **Details** - Details contribute to development of ideas and information, evoke images, or otherwise elaborate on or clarify the content of the writing.
- **Voice or Tone** - An appropriate voice or tone is established and maintained.

**Writing Conventions**

1.6 Students’ independent writing demonstrates command of appropriate English conventions, including grammar, usage, and mechanics.
Responses to Literature
(content/concepts)

1.7 In written responses to literature, students show understanding of reading; connect what has been read to the broader world of ideas, concepts, and issues; and make judgments about the text.

Reports
(skills/processes)

1.8 In written reports, students organize and convey information and ideas accurately and effectively.

Narratives
(skills/processes)

1.9 In written narratives, students organize and relate a series of events, fictional or actual, in a coherent whole.

Procedures
(skills/processes)

1.10 In written procedures, students relate a series of steps that a reader can follow.

Persuasive Writing
(skills/processes)

1.11 In persuasive writing, students judge, propose, and persuade.

Personal Essays
(applies to grades 9-12 only)

(skills/processes)

1.12 In personal essays, students make connections between experience and ideas.

Poetry
(skills/processes)

1.23 In writing poetry, students use a variety of forms.

LISTENING

Clarification and Restatement
(skills/processes)

1.13 Students listen actively and respond to communications.

Critique
(skills/processes)

1.14 Students critique what they have heard (e.g., music, oral presentation).

EXPRESSION

Speaking
(skills/processes)

1.15 Students use verbal and nonverbal skills to express themselves effectively.

Artistic Dimensions
(skills/processes)

1.16 Students use a variety of forms, such as dance, music, theater, and visual arts, to create projects that are appropriate in terms of the following dimensions:

Skill Development
Projects exhibit elements and techniques of the art form, including expression, that are appropriate to the intent of the product or performance.

Reflection and Critique
Students improve upon products and performances through self-reflection and outside critique, using detailed comments that employ the technical vocabulary of the art form.

Making Connections
Students relate various types of arts knowledge and skills within and across the disciplines.
## Appendix B

### Approach to Work
Students safely approach their media, solve technical problems as they arise, creatively generate ideas, and cooperate with ensemble members where applicable.

### Notation and Representation (content/concepts)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.17</td>
<td>Students interpret and communicate using mathematical, scientific, and technological notation and representation.</td>
</tr>
</tbody>
</table>

### INFORMATION TECHNOLOGY/INFORMATION LITERACY

#### Information Technology (skills/processes)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.18</td>
<td>Students use computers, telecommunications, and other tools of technology to research, to gather information and ideas, and to represent information and ideas accurately and appropriately.</td>
</tr>
</tbody>
</table>

#### Research (skills/processes)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.19</td>
<td>Students use organizational systems to obtain information from various sources (including libraries and the Internet).</td>
</tr>
</tbody>
</table>

#### Communication of Data (content/concepts)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.20</td>
<td>Students use graphs, charts, and other visual presentations to communicate data accurately and appropriately.</td>
</tr>
</tbody>
</table>

#### Selection (content/concepts) (applies to grades 5-12 only)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.21</td>
<td>Students select appropriate technologies and applications to solve problems and to communicate with an audience.</td>
</tr>
</tbody>
</table>

### Simulation and Modeling (content/concepts) (applies to grades 9-12 only)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.22</td>
<td>Students employ a variety of techniques to use simulations and to develop models.</td>
</tr>
</tbody>
</table>

### Reasoning and Problem Solving Standards

#### QUESTIONING

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Students ask a variety of questions.</td>
</tr>
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</table>

#### PROBLEM SOLVING

##### Problem Solving Process (skills/processes)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2</td>
<td>Students use reasoning strategies, knowledge, and common sense to solve complex problems related to all fields of knowledge.</td>
</tr>
</tbody>
</table>

##### Types of Problems (skills/processes) (applies to grades 5-12 only)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>Students solve problems of increasing complexity.</td>
</tr>
</tbody>
</table>

##### Improving Effectiveness (skills/processes) (applies to grades 5-12 only)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>2.4</td>
<td>Students devise and test ways of improving the effectiveness of a system.</td>
</tr>
</tbody>
</table>

##### Mathematics Dimensions (content/concepts)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>2.5</td>
<td>Students produce solutions to mathematical problems requiring decisions about approach and presentation, so that final drafts are appropriate in terms of these dimensions:</td>
</tr>
</tbody>
</table>
Appendix B

PreK-8
Understanding:
Demonstration of understanding of the problem.

Approach:
The strategies and skills used to solve the problem.

Reasoning:
The reasoning used to solve the problem.

Observations and Extensions:
Demonstration of observation, connections, application, extensions, and generalizations.

Mathematical Language:
The use of mathematical language in communicating the solution.

Mathematical Representation:
The use of mathematical representation to communicate the solution.

Presentation:
Presentation of the solution.

9-12
Approach and Reasoning:
The strategies and skills used to solve the problem, and the reasoning that supports the approach.

Execution:
The answer and the mathematical work that supports it.

Observations and Extensions:
Demonstration of observation, connections, application, extensions, and generalizations.

Mathematical Representation:
The use of mathematical vocabulary and representation to communicate the solution.

Presentation:
Effective communication of how the problem was solved, and of the reasoning used.

APPRAOCH

Application (disposition) 2.6 Students apply prior knowledge, curiosity, imagination, and creativity to solve problems.

Information (disposition) 2.7 Students respond to new information by reflecting on experience and reconsidering their opinions and sources of information.

Taking Risks (disposition) 2.8 Students demonstrate a willingness to take risks in order to learn.

Persevering (disposition) 2.9 Students persevere in the face of challenges and obstacles.

ABSTRACT AND CREATIVE THINKING

Fluency (skills/processes) 2.10 Students generate several ideas, using a variety of approaches.

Elaboration (skills/processes) 2.11 Students represent their ideas and/or the ideas of others in detailed form.

Flexibility (disposition) 2.12 Students modify or change their original ideas and/or the ideas of others to generate innovative solutions.

Product/Service (skills/processes) 2.13 Students design a product, project, or service to meet an identified need.

Planning/Organization (skills/processes) 2.14 Students plan and organize an activity.

Personal Development Standards

WORTH AND PERSONAL COMPETENCE

Goal-Setting (skills/processes) 3.1 Students assess their own learning by developing rigorous criteria for themselves, and use
these to set goals and produce consistently high-quality work.

Learning Strategies
(disposition)

3.2 Students assess how they learn best, and use additional learning strategies to supplement those already used.

Respect
(disposition)

3.3 Students demonstrate respect for themselves and others.

HEALTHY CHOICES

Development
(content/concepts)

3.4 Students identify the indicators of intellectual, physical, social, and emotional health for their age and/or stage of development.

Healthy Choices
(content/concepts)

3.5 Students make informed, healthy choices that positively affect the health, safety, and well-being of themselves and others.

Fitness
(disposition)

3.6 Students exercise regularly, demonstrating competence in many movement forms and proficiency in a few forms of physical activity.

MAKING DECISIONS

Informed Decisions
.skills/processes)

3.7 Students make informed decisions.

Personal Economics
(content/concepts)

3.8 Students demonstrate an understanding of personal economic decisions, and account for their decisions.

Environment
(disposition)

3.9 Students take steps to protect and repair the environment.

RELATIONSHIPS

Teamwork
(skills/processes)

3.10 Students perform effectively on teams that set and achieve goals, conduct investigations, solve problems, and create solutions (e.g., by using consensus-building and cooperation to work toward group decisions).

Interactions
(disposition)

3.11 Students interact respectfully with others, including those with whom they have differences.

Conflict Resolution
(skills/processes)

3.12 Students use systematic and collaborative problem-solving processes, including mediation, to negotiate and resolve conflicts.

Rules and Responsibilities
(content/concepts)

3.13 Students analyze their roles and responsibilities in their family, their school, and their community.

WORKPLACE

Dependability and Productivity
(disposition)

3.14 Students demonstrate dependability, productivity, and initiative.
Appendix B

Career Choices (content/concepts)

3.15 Students know about various careers.

Transition Planning (for grades 5-12) (content/concepts)

3.16 Students develop a plan for current and continued education and training to meet personal and career goals.

Civic/Social Responsibility Standards

SERVICE

Service (disposition)

4.1 Students take an active role in their community.

Democratic Processes (disposition)

4.2 Students participate in democratic processes.

HUMAN DIVERSITY

Cultural Expression (content/concepts)

4.3 Students demonstrate understanding of the cultural expressions that are characteristic of particular groups.

Effects of Prejudice (content/concepts)

4.4 Students demonstrate understanding of the concept of prejudice, and of its effects on various groups.

CHANGE

Continuity and Change

Arts, Language, and Literature Standards

CRITICAL RESPONSE

Eras and Styles (content/concepts)

5.1 Students demonstrate understanding of the historical eras, styles, and evolving technologies that have helped define forms and structures in the arts, language, and literature.

Times and Cultures (content/concepts)

5.2 Students demonstrate how literature, philosophy, and works in the arts influence and reflect their time and their local and regional culture.

Universal Themes (content/concepts)

5.3 Students discover universal themes by comparing a broad range of cultural expressions from various times and places.

Aesthetic Judgment (content/concepts)

5.4 Students form aesthetic judgment, using appropriate vocabulary and background knowledge to critique their own work and the work of others, and to support their perception of work in the arts, language, and literature.

Point of View (disposition)

5.5 Students develop a point of view that is their own (e.g., personal standards of appreciation for the arts, language, and literature).
Critique and Revision (disposition)

5.6 Students review others’ critiques in revising their own work, separating personal opinion from critical analysis.

Audience Response (disposition)

5.7 Students respond constructively as members of an audience (e.g., at plays, speeches, concerts, town meeting).

LITERATURE AND MEDIA

Types of Literature (content/concepts)

5.8 Students read a variety of types of literature, fiction and nonfiction (e.g., poetry, drama, essays, folklore and mythology, fantasy and science fiction, and public documents, such as newspapers and periodicals).

American Literature (content/concepts)

5.9 Students interpret contemporary and enduring works of American literature, and understand how important themes of American experience have developed through time.

Diverse Literary Traditions (content/concepts)

5.10 Students interpret works of diverse literary traditions including works by women and men of many racial, ethnic, and cultural groups in different times and parts of the world.

Literary Elements and Devices (content/concepts)

5.11 Students use literary elements and devices including theme, plot, style, imagery, and metaphor to analyze, compare, interpret, and create literature.

Literate Community (disposition)

5.12 Students participate as members of a literate community, talking about books, ideas, and writing.

Responding to Text (skills/processes)

5.13 Students respond to literary texts and public documents using interpretive, critical, and evaluative processes.

Responding to Media (content/concepts)

5.14 Students interpret and evaluate a variety of types of media, including audio, graphic images, film, television, video, and online resources.

Design and Production (content/concepts)

5.15 Students design and create media products that successfully communicate.

THE ENGLISH LANGUAGE

Changes in Language (content/concepts)

5.16 Students demonstrate understanding of the ways in which the English language evolves and changes (e.g., word origins, impact of major events).
Appendix B

Structures (content/concepts)

5.17 Students respect diversity in dialects.

5.18 Students demonstrate an understanding of the structures of the English language (e.g., sentence, paragraph, text structure).

NON-NATIVE LANGUAGE

Speaking and Listening (skills/processes)

5.19 Students speak and listen in a non-native language.

Reading (skills/processes)

5.20 Students read a non-native language.

Writing (skills/processes)

5.21 Students write a non-native language.

ARTISTIC PROCESS

Intent (skills/processes)

5.22 Students convey artistic intent from creator to viewer or listener.

Critique (disposition)

5.23 Students critique their own and others’ works in progress, both individually and in groups, to improve upon intent.

Artistic Problem Solving (skills/processes)

5.24 Students solve visual, spatial, kinesthetic, aural, and other problems in the arts.

Exemplary Works (content/concepts)

5.25 Students demonstrate knowledge of exemplary works in the arts from a variety of cultures and historical periods.

Analysis (applies to grades 5-8 only) (content/concepts)

5.26 Students develop and present basic analysis of works in the arts from structural, historical, economic, and cultural perspectives.

Perspective (applies to grades 9-12 only) (content/concepts)

5.27 Students combine perspectives to develop and present basic analysis of works in the arts, and they convey the ability to evaluate work in the various arts disciplines.

ELEMENTS, FORMS, AND TECHNIQUES IN THE ARTS

Artistic Proficiency (skills/processes)

5.28 Students use art forms to communicate, showing the ability to define and solve artistic problems with insight, reason, and technical proficiency.

Visual Arts (content/concepts)

5.29 Students use the elements and principles of two- and three-dimensional design in the visual arts, including line, color, shape, and texture, in creating, viewing, and critiquing.
Appendix B

(content/concepts)
5.30 Students use a variety of visual arts media (e.g., clay, tempera, watercolor, paper mache, animation, computer-aided design, video) to show an understanding of the different properties each possesses.

Music
(content/concepts)
5.31 Students use the elements of vocal and instrumental music, including rhythm, pitch, timbre, and articulation.

(skills/processes)
5.32 Students translate an idea into music notation or sound.

Theater
(content/concepts)
5.33 Students use aspects of voice including volume, diction, pause, tempo, and inflection to enhance a role.

(content/concepts)
5.34 Students show awareness of audience and character through aspects of movement, including blocking, gesture, use of body, and motivation.

(content/concepts)
5.35 Students connect directorial and design choices to a script or role-play.

Dance
(content/concepts)
5.36 Students use dance vocabulary and locomotor movements (such as jump, leap, slide, skip) and axial movements (such as bend, twist, stretch) to show underlying movement skills such as alignment, balance, weight, shift, and elevation.

(content/concepts)
5.37 Students combine movement (in patterns using elements of space, time, and energy) with structural form (beginning, middle, end) to create a piece.

Note: See also related Vital Results Standards for Communication (page 84).

History and Social Sciences Standards

CRITICAL EVALUATION

Causes and Effects in Human Societies
(skills/processes)
6.1 Students examine complex webs of causes and effects in relations to events in order to generalize about the workings of human societies, and they apply their findings to problems.

Uses of Evidence and Data
(skills/processes)
6.2 Students understand the varied uses of evidence and data, and use both to make interpretations concerning public issues.

Analyzing Knowledge
(skills/processes)
6.3 Students analyze knowledge as a collection of selected facts and interpretations based on a particular historical or social setting.
## HISTORY

### Historical Connections
(content/concepts)

**6.4 Students identify major historical eras and analyze periods of transition in various times in their local community, in Vermont, in the United States, and in various locations worldwide, to understand the past, the present, and the relationship between the two.**

### Traditional and Social Histories
(content/concepts)

**6.5 Students investigate both the traditional and the social histories of the people, places, and cultures under study, including those of indigenous peoples.**

### Being a Historian
(skills/processes)

**6.6 Students use historical methodology to make interpretations concerning history, change, and continuity.**

## CITIZENSHIP

### Meaning of Citizenship
(content/concepts)

**6.9 Students examine and debate the meaning of citizenship and act as citizens in a democratic society.**

### Types of Government
(content/concepts)

**6.10 Students compare and evaluate the philosophical underpinnings and the workings of different types of governments, including constitutional governments, in various times in their local community, in Vermont, in the United States, and in various locations worldwide.**

### Institutional Access
(content/concepts)

**6.11 Students analyze the access that various groups and individuals have had to justice, reward, and power, as those are evident in the institutions in various times in their local community, in Vermont, in the United States, and in various locations worldwide.**

### Human Rights
(content/concepts)

**6.12 Students identify and evaluate the concept of human rights in various times in their local community, in Vermont, in the United States, and in various locations worldwide.**

## GEOGRAPHY

### Geographical Knowledge
(content/concepts)

**6.7 Students use geographical knowledge and images of various places to understand the present, communicate historical interpretations, develop solutions for problems, and plan for the future.**

### Movements and Settlements
(content/concepts)

**6.8 Students analyze the factors and implications associated with the historical and contemporary movements and settlements of people and groups in various times in their local community, in Vermont, in the United States, and in various locations worldwide.**
DIVERSITY AND UNITY

Concepts of Culture (content/concepts)
6.13 Students understand the concept of culture, including the cultures of indigenous peoples, in various times in their local community, in Vermont, in the United States, and in various locations worldwide.

Forces of Unity and Disunity (content/concepts)
6.14 Students understand the tensions between the forces of unity and those of disunity in various times in their local community, in Vermont, in the United States, and in various locations worldwide.

ECONOMICS

Knowledge of Economic Principles (content/concepts)
6.15 Students use the basic principles of economics to interpret local, state, national, and international economic activity.

Impact of Economic Systems (content/concepts)
6.16 Students evaluate the impact of economic systems on the needs and wants of all people and on the environment in various times in their local community, in Vermont, in the United States, and in various locations worldwide.

Governments and Resources (content/concepts)
6.17 Students understand how governments affect the flow of resources, goods, and services.

CONFLICTS AND CONFLICT RESOLUTION

Nature of Conflict (content/concepts)
6.18 Students analyze the nature of conflicts, how they have been or might be resolved, and how some have shaped the divisions in various times of their local community, Vermont, the United States, and the world.

IDENTITY

Identify Changes, Construction, and National Identity (content/concepts)
6.19 Students understand the variety of influences and impacts of the construction, preservation, and change of identity, within families, other social

Science, Mathematics, and Technology Standards

INQUIRY, EXPERIMENTATION, AND THEORY

Scientific Method (skills/processes)
7.1 Students use scientific methods to describe, investigate, and explain phenomena. Raise questions; Generate alternative explanations/hypotheses based on observations and prior
knowledge;

Design inquiry that allows these explanations to be tested;

Deduce the expected results;

Gather and analyze data to compare the actual results to the expected outcomes; and

Make and communicate conclusions, generating new questions raised by observations and readings.

**Investigation**  
(skills/processes)  

**7.2** Students design and conduct a variety of their own investigations and projects. These should include:

Questions that can be studied using the resources available;

Procedures that are safe, humane, and ethical;

Data that are collected and recorded in ways that others can verify;

Data and results that are represented in ways that address the question at hand;

Recommendations, decisions, and conclusions that are based on evidence, and that acknowledge references and contributions of others;

Results that are communicated appropriately to audiences; and

Reflections and defense of conclusions and recommendations from other sources, and peer review.

**Theory**  
(content/concepts)  

**7.3** Students understand the nature of mathematical, scientific, and technological theory.

**History of Science, Mathematics, and Technology**  
(content/concepts)  

**7.4** Students understand the history of science, mathematics, and technology.

**Roles and Responsibilities**  
(content/concepts)  

**7.5** Students analyze the roles and responsibilities of scientists, mathematicians, and technologists in social, economic, cultural, and political systems.

**MATHEMATICAL UNDERSTANDING**

**Arithmetic, Number, and Operation Concepts**  
(content/concepts)  

**7.6** Students understand arithmetic in computation, and they select and use, in appropriate situations, mental arithmetic, pencil and paper, calculator, and computer.

**Geometric and Measurement Concepts**  
(content/concepts)  

**7.7** Students use geometric and measurement concepts.

**Function and Algebra Concepts**  
(content/concepts)  

**7.8** Students use function and algebra concepts.

**Statistics and Probability Concepts**  
(content/concepts)  

**7.9** Students use statistics and probability concepts.
MATHEMATICAL PROBLEM SOLVING

Applications
(content/concepts)
7.10 Students use concrete, formal, and informal strategies to solve mathematical problems, apply the process of mathematical modeling, and extend and generalize mathematical concepts. Students apply mathematics as they solve scientific and technological problems or work with technological systems.

The Human Body
(content/concepts)
7.14 Students demonstrate understanding of the human body, heredity, body systems, and individual development, and understand the impact of the environment on the human body.

SYSTEMS

Analysis
(content/concepts)
7.11 Students analyze and understand living and non-living systems (e.g., biological, chemical, electrical, mechanical, optical) as collections of interrelated parts and interconnected systems.

THE UNIVERSE, EARTH, AND THE ENVIRONMENT

Theories, Systems, and Forces
(content/concepts)
7.15 Students demonstrate understanding of the earth and its environment, the solar system, and the universe in terms of the systems that characterize them, the forces that affect and shape them over time, and the theories that currently explain their evolution.

SPACE, TIME, AND MATTER

Matter, Motion, Forces, and Energy
(content/concepts)
7.12 Students understand forces and motion, the properties and composition of matter, and energy sources and transformations.

DESIGN AND TECHNOLOGY

Natural Resources
(content/concepts)
7.16 Students understand how natural resources are extracted, distributed, processed, and disposed of.

Organisms, Evolution, and Interdependence
(content/concepts)
7.13 Students understand the characteristics of organisms, see patterns of similarity and differences among living organisms, understand the role of evolution, and recognize the interdependence of all systems that support life.

Technological Systems
(content/concepts)
7.17 Students apply knowledge and understanding of technological systems to respond to a variety of issues.

Outputs and Impacts
(content/concepts)
7.18 Students understand that people control the outputs and
impacts of our expanding technological activities in the areas of communication, construction, manufacturing, power and transportation, energy sources, health technology, and biotechnology.

Designing Solutions (content/concepts)

7.19 Students use technological/engineering processes to design solutions to problems.
Appendix C

Glossary
Vermont Department of Education 1999

Action Plan
A school plan that is based on data and other indicators (state, local, classroom), related to standards, and designed to impact student performance.

Alignment
The directness of the linkage among standards, local curriculum, instructional materials, instructional methods, and assessments.

All Students
Standards are designed to raise expectations for every student. A small percentage of Vermont students may not meet the standards because of the extreme severity of their disabilities. An example might be a high school student with a severe disability who functions at a preschool academic level. Accommodations for such students should be specifically addressed in their Individualized Educational Programs, within the spirit and context of what the standards intend. By all students we mean specifically (adapted from the National Council of Teachers of Mathematics, 1989):

- Students who have been denied access in any way to educational opportunity, as well as those who have not;
- Students who are female, as well as those who are male;
- Students who are African-American, Hispanic, Asian, American Indian, or members of other minorities, as well as those who are members of the racial or ethnic majority;
- Students who are socioeconomically disadvantaged, as well as those who are more advantaged; and
- Students who have not been successful in school, as well as those who have been successful.

Analytic Scoring
A scoring procedure in which performances are evaluated for selected dimensions or traits, with each trait receiving a separate score. Involves a quantitative judgment that identified dimensions or traits are more or less present. Reports a profile of characteristics or attributes. Analytic scoring guides specify criteria to be assessed, provide a separate score for each criterion, and may include a composite score for overall performance. In some cases, the composite score is weighted based on the importance of each dimension.

Anchor
Another word for benchmark.

Anchor Task
A performance task that is given uniformly to all students that allows comparisons regarding the relative strengths and weaknesses of students’ skills. Demonstrates performance against a standard(s), showing the relative strengths and weaknesses of students’ work.

Assessment
The process of quantifying, describing, gathering data about, and/or giving feedback about performance. Assessment helps us identify where we might need to improve instructional practices for students, focus professional development for teachers, and supply new or different instructional resources for learners.

Assessment Plan
An assessment plan is a set of choices regarding how student learning will be assessed in relation to the standards and criteria identified.

Assessment Tools
Assessment tools are what the student produces and what the assessor uses to provide feedback in terms of where the student is in relation to a standard. These include selected responses, constructed responses (short answer, products, and/or performances), observations, and scoring guides (e.g., answer keys, checklists, rubrics.)

Authentic Assessment
The process of gathering evidence and documentation of a student's learning and growth in ways that resemble "real life" as closely as possible (e.g., a driving test, a presentation to a board on a "real" issue). The student's work is compared to a standard, rather than compared to the work of others, in order to measure growth and progress. Authentic assessment is based on what the child actually does, in a variety of contexts, at points throughout the school year. Authentic samples of student work are collected to serve as indicators of the child's growth and progress. These samples are authentic, meaning they represent the student's application, not mere acquisition, of knowledge and skills. An authentic
assessments also engages students in the activity and reflects best instructional activities. Thus, teaching to the authentic assessment is desirable.

**Baseline Data**
The first time we collect evidence we are establishing baseline data. This is the starting point from which we can measure change.

**Benchmark**
An actual example of student work that provides an interpretation of a performance standard according to age, grade, or developmental levels. Synonymous with “anchor.”

**Bias**
Bias is the emplyment of language, process, and/or structure that have different meanings for, are emotionally loaded for, reinforce stereotypes about, or do not encompass the full range of: race, gender, ethnicity, age, sexual orientation, or physical or mental condition.

**Classroom Assessment**
Classroom assessment is embedded in learning and teaching activities, and it is an integral part of instruction. This is ongoing and relevant to immediate learning.

**Closed-Ended Tasks**
Closed-ended tasks are those that have one right or best answer. Closed-ended tasks should be used only to assess specific knowledge or information students have acquired.

**Constructed Response Items or Tasks**
Constructed response items or tasks are those for which the student must create his/her response or answer (e.g., short written or oral answer, product, performance). Constructed response items or tasks are used to assess processes or procedural knowledge, or to probe for students’ understanding of knowledge and information. Often contrasted with selected response items or tasks.

**Context**
The circumstances in which a performance is embedded. For example, problem solving can be assessed in the context of a specific subject (e.g., mathematics) or in the context of a real-life laboratory problem requiring the use of mathematical, scientific, and communication skills. Science process skills can be assessed in the context of a large-scale, high-stakes assessment or in the context of a classroom test. Context can also distinguish whether a performance is completed on demand or over time. Finally, context can refer to whether a task is done alone, in pairs, or in a group.

**Criteria**
Criteria specify the dimensions or characteristics of standards used to judge student work. When combined with a scale and performance descriptions, these elements we value in student performance become rubrics or scoring guides to be used in assessment. Scoring guides embody and express our criteria. For example, our criteria for good reading might include characteristics such as fluency, flexibility, making connections within and between texts, and making connections with personal experience. These criteria would be expressed in rubrics, and the rubrics used to assess student performance in reading. Benchmark papers or performances may be used to identify each level of proficiency in the scoring guide.

**Criterion-Referenced Assessment**
This type of assessment compares a student’s performance with a description of the desired performance. For example: She typed 55 words per minute without errors when the criterion was 40 words per minute with no more than two errors. All standards-based assessments are criterion-referenced assessments, though not all criterion-referenced assessments are standards-based assessments. Criterion-referenced assessment is often contrasted with norm-referenced assessment.

**Data**
Data are records and reports of formal and informal observations, experiences, events, facts, and/or figures from which conclusions can be inferred. Data become information when they are put to use, as for planning and decision making.

**Demographics**
Distribution, density, and vital statistics of a population. Demographics are often used to disaggregate data.

**Diagnostic Assessment**
Assessment that enables you to infer what a student does and does not know and is and is not able to do.

**Disaggregated Data**
Data that has been organized in subgroups for the purpose of analysis. Common examples of ways to disaggregate
data include gender, ethnicity, socioeconomic status, curriculum experienced, and sending schools.

**Distribution of Scores**
A distribution is a way of summarizing a group or a set of scores. Distributions may be graphed to demonstrate visually the relations among the scores in a group or set. In such graphs, the horizontal axis is the continuum on which individuals are measured; the vertical axis is the frequency (or number) of individuals earning any given score.

**Equity**
Fairness and impartiality. Equity is often considered in relation to learning opportunities and assessment bias.

**Error Bar**
A graphic illustration of the percentage of students scoring in a performance level including the standard error.

**Evaluation**
Judgment regarding the quality, value, or worth of a response, product, or performance based on established criteria. Evaluations are usually based on multiple sources of information. The terms "evaluation" and "assessment" are often used interchangeably.

**Exemplars**
Exemplars are benchmark papers or performances. They provide a clear and stable reference point for giving feedback to students, educators, and the public in relation to standards (that give students a clear picture of the targets they are aiming for), and they define levels of performance in concrete, meaningful, and public ways.

**Fields of Knowledge**
Within Vermont's Framework of Standards and Learning Opportunities, the fields of knowledge are the content areas that are combined and applied to achieve the vital results. The three fields of knowledge are arts, language and literature; history and social sciences; and science, mathematics, and technology.

**Formative Assessment**
Ongoing assessment providing data to guide instruction and improve performance.

**Generalizability**
In assessment, this term refers to the extent to which the performances sampled by a set of assessment items or tasks is representative of the broader domain being assessed. For example, can we generalize about a student's problem-solving ability from the student's performance on a specific set of 10 problem-solving tasks? How many samples of student work are needed to be confident that a student can problem solve in mathematics?

**Generalized Rubric**
A rubric that can be used for a wide range of products and performances and multiple tasks to which the same criteria can be applied. For example, generalized rubrics are often used to assess standards for problem solving, communication, and scientific method.

**Holistic Scoring**
Assigning one overall score to a performance based on overall quality. Through the use of a holistic scoring guide, performance is judged qualitatively by a single description for each level on the scale. Holistic scoring is appropriate when a dimension or attribute cannot be or works best not being broken down into separate components or criteria, such as creativity, fitness, or teamwork. At times holistic scoring is also used when clumping of the characteristics of a performance on a standard is the more useful level of information, such as the overall quality of a piece of writing.

**Indicator**
A measure that describes performance related to standards and other aspects of educational systems. An indicator must have a common, agreed-upon, consistent definition and a reference point or standard against which performance can be judged. An indicator must meet technical standards of quality, such as measuring what is intended to be measured (validity) and measuring consistently (reliability).

**Item Bias**
An item is biased to the degree that the score is related to race, gender, ethnicity, age, sexual orientation, or physical or mental condition of the respondent as well as to any difference in the construct being assessed.

**Large-Scale Assessment**
Assessment for purposes and audiences beyond the classroom. Large-scale assessments are usually standardized to some extent and given to large numbers of students.
Appendix C

Learning and Teaching Activities
These are the means through which students learn and demonstrate particular knowledge, skills, and habits of mind (creative thinking, self regulation) relative to desired standards.

Learning Opportunities
Within Vermont's Framework of Standards and Learning Opportunities, these are the recommended practices to support all students in attaining the standards. These are presented for access, instruction, assessment, connections, and best practices in the fields of knowledge. They represent areas that can be influenced by the educational system, and they are supported by current research and best practices.

Mean Score
The arithmetic average of the scores.

Measures of Central Tendency
Mean, median, and mode.

Median Score
The score at the mid-point of a range of scores, which means that half the scores are higher and half the scores are lower. This measure of central tendency is less influenced by extreme scores than are mean and mode.

Multiple Measures
More than one way for students to demonstrate attainment of a standard. Students need to be provided with multiple opportunities to perform in relation to standards. Multiple opportunities to perform can apply to the assessment approach (open-ended vs. closed-ended), format (constructed response vs. selected response), or context (on demand vs. over time; the setting; the purpose of the assessment).

Norm-Referenced Assessments
Assessments in which student performance is interpreted in relation to a group of students who have already taken the assessment (the norm group).

Norm-Referenced Results
See percentile, Quartile, Stanine, Normal Curve Equivalent (NCEs), and Scale Score.

Normal Curve Equivalent Score
An equal interval score that identifies a score’s placement on a normal curve distribution (1 to 100). Because the NCE is based on equal intervals, it is possible to use statistics to compare subscores and groups, and to measure gains.

On-Demand Assessment
Assessment that occurs at a predetermined time and place. On-demand assessment often must be completed in a set amount of time and under prescribed conditions. Most large-scale (state, national) assessments and many classroom tests are on-demand assessments.

Open-Ended Task
A performance task with no single correct response. Open-ended tasks are used to determine how students use what they know, how they demonstrate a skill or process, how they communicate what they understand, or how they apply what they know in a new context.

Over Time
Over time refers to performances given over an extended period of time and, usually, revisited several times, resulting in an evolved or final draft. Problem solving that truly involves the "unraveling" of an issue or circumstance must be done over time.

Percentile
The ranking of scores that refers to the percentage of people whose performance the student has equaled or surpassed.

Performance Assessment
This is direct observation and judgment of student products or performances. Performance assessment has pre-established criteria for quality work. In standards-based performance assessment, these criteria are taken directly from the standards.

Performance Gap
The difference between present performance and targeted performance.

Performance Standard
A performance standard is used to define desired performance on a standard. It is an established level of achievement, quality of performance, or degree of proficiency on a standard. This is determined based on multiple performances. A performance standard is usually set by an expert group on the basis of the standard, student performance data, knowledge of what students are capable of doing, and the intended use of the results.
Appendix C

Performance Target
The goal that a school sets for performance. For example, "Sixty percent of the students will achieve the standard or achieve the standard with honors."

Portfolio
A purposeful, integrated collection of student work showing effort, progress, or achievement in one or more areas. Usefulness for instruction and assessment is enhanced when students select the items for their portfolios, self-assessment is encouraged, and criteria for success are clear.

Primary Trait Scoring
A scoring procedure by which products or performances are evaluated by limiting attention to a single aspect or a few selected aspects of a criterion. Looks for one or two specific attributes or characteristics to be present or absent; acts like a checklist. For example, if a student is asked to write to the Department of Energy to urge the opening or closing of a nuclear plant, the primary traits might be using the correct form of address and the correct letter form. Scorers would attend only to these two traits.

Proficiency
Demonstration of a high level of skill, knowledge, or adeptness. In standards-based assessment, proficiency may be defined by descriptors on a rubric and/or by cut scores on a standards-based assessment.

Prompt
An assignment or direction(s) asking the student(s) to undertake a task or series of tasks. Complete prompts present the context of the situation, the problem(s) to be solved, and the criteria by which the responses will be evaluated.

Quartile
Quartiles divide scores into four equal groups. The lowest quartile consists of the lowest 25% of the scores of the norm group. The highest quartile represents the highest 25% of the scores of the norm group.

Reliability
The degree to which the results of an assessment are dependable and yield consistent results. Reliability is an indication of the consistency of scores across evaluators, across time, or across different tasks that measure the same thing. An assessment is considered reliable to the degree the same responses receive the same scores no matter when the assessment occurs or who does the scoring. Technically, reliability is a statistical term that defines the extent to which errors of measurement are absent from an assessment instrument. The following issues are particularly relevant to establishing reliability in the classroom:

- Criteria that are clear, do not overlap, and are taken directly from standards;
- A scale that makes clear distinctions among its levels;
- Performance descriptions that are specific, are observable, and can be documented;
- Exemplars of student work that illustrate levels of attainment; and
- Evidence of consistent judgment over time and across students.

Rubric
One type of scoring guide for rating students’ performance on tasks. Good rubrics consist of a fixed measurement scale (e.g., 4-point), a set of clear criteria, and performance descriptions for each criterion at each point on the scale. In standards-based education, sample responses (benchmarks) that illustrate various levels of performance are included. A rubric is not truly complete until accompanied by benchmarks.

Sampling (of Performance)
The selection of an array of performances to be assessed that is wide enough in range and large enough in number to: (a) cover the scope of the performances addressed by the assessment system in terms of representativeness and comprehensiveness, and (b) permit valid inferences about performances to be made.

Scale
A scale is a continuum, such as scores possible on a test or individual performance task. There are several types of scales. For example:

- Nominal (or naming) scales categorize by identity only (e.g., male and female; African-American, Hispanic, Asian, and American Indian).
- Ordinal (or ordering) scales are categorized by identity and order (e.g., a ranking such as first through fifth; a percentile). Most rubrics have ordinal scales.
- Interval scales are categorized by a fixed unit of measurement (e.g., temperature, age).
- Performance assessment items are typically scored on a four- to six-point ordinal scale compared with
a nominal scale of two (right/wrong, present /absent) on true/false items and checklists.

Scale Score
A score that converts raw scores to a scale for purposes of test interpretation. A common type of scale score system that takes into account individual item difficulty and other technical aspects of the test produces a range of 0 to 1,000 for a K-12 range. It is possible to establish cut scores for meeting a standard for each grade and/or to establish average scale scores for each grade in this system. Scale scores are also used to adjust scores on two or more forms or a test so that they represent student performance as though the tests were equally difficult.

Scoring
See Analytic Scoring and Holistic Scoring.

Scoring Guides
Scoring guides are assessment tools used to determine where a student is in relation to the standard. Examples of scoring guides include checklists, generalized and task-specific rubrics, answer keys, and scoring templates.

Selected Response Items or Tasks
Selected response items or tasks are those in which the student selects from among responses that are presented to him/her (e.g., true/false, matching, multiple choice).

Sequential Scoring
When there is a separate rubric or checklist for each standard demonstrated by the performance, each is applied to the performance, and each result is applied to the appropriate standard. For example, a task that assesses problem-solving and concepts of functions would be scored sequentially using first a problem solving rubric and then the rubric for concepts of functions.

Simultaneous Scoring
When one rubric or checklist can be used to provide information on more than one standard. This can only happen when the performance to be scored is the same in both standards, such as the inquiry process in science and mathematics.

Standardization
A set of consistent procedures for administering and scoring an assessment. The goal of standardization is to ensure that all students are assessed under uniform conditions so that interpretation of their performance is comparable and not influenced by differing conditions.

Standards and Evidence
Standards define the essential knowledge and skills that should be taught and learned in school. Within Vermont's Framework of Standards and Learning Opportunities, many of the standards are accompanied by evidence. Evidence, taken collectively over time, indicates whether a student demonstrates he or she has met the standards.

Standards-Based (See also Standards-Linked)
Standards-based is a descriptor that suggests that a clear and direct relationship exists among any combination of activities, materials, instructional processes, and assessments that all relate to each other and to identified standards.

Standards-Based Assessment
Standards-based assessment is criterion-referenced assessment in which the criteria are taken directly from standards.

Standards-Based Curriculum
Standards-based curriculum is designed with a specific focus on standards and accompanying evidence. Cumulatively, across all learning experiences and units of study, as well as their related assessments, all students have access to and demonstrate attainment of the knowledge and skills identified in the standards.

Standards-Based Reporting
Standards-based assessments are reported by distribution of scores across proficiency levels in relation to standards.

Standards-Based System
In a standards-based system, the classroom curriculum is designed to help students attain identified standards. What is important is a congruence among a focus on standards, the learning-teaching activities and materials selected to engage students, and the assessments used to document student attainment of the standards. Published materials, units of study, skill sequences, instructional experiences, routines or strategies, and assessments are standards-based only to the extent they link learners with standards within a classroom and across classrooms and grades, in a consistent and purposeful way.

Standards-Based Unit of Study
A standards-based unit of study is a combination of activities, materials, instructional processes, and assessments that all relate directly to each other and to identified standards and that are designed to lead the student directly to the attainment of the identified standards.

**Standards-Linked** (See also Standards-Based)
Standards-linked is a descriptor that suggests that a process has taken place to determine that a relationship exists between identified standards and particular activities, materials, assessments, etc.

**Standards-Referenced Assessment**
Standards-referenced assessments provide scores that describe student performance against a set of standards, not against other students.

**Stanine**
Nine-point scales that allow the conversion of percentile ranks into nine larger units.

**Summative Assessment**
A snapshot of student performance at a given point in time, judged according to preestablished standards and criteria. Summative assessment typically leads to a status report on success or degree of proficiency.

**Task**
An activity, exercise, or problem given to the students to perform. The best tasks elicit multiple responses to a challenging question or problem and are aligned with one or more standards. For example, students write an essay, design an experiment, or solve a math problem.

**Task-Specific Rubric**
A set of scoring guidelines that is specific to a particular task. The criteria are addressed and described in terms of specific content or capacities that can be demonstrated in terms of particular, identified content relevant to the task.

**Test**
A set of items or situations designed to permit an inference about what an examinee knows or can do in one or more areas related to standards.

**Validity**
The accuracy of inferences based on an assessment’s results.

- **Content Validity** – The degree to which an assessment represents the content of the assessment domain being sampled.
Selecting Standards-Based Science and Math Teaching Materials

Vermont Institute for Science, Math and Technology

The demands of standards-based teaching and learning require a combination of strong content knowledge, sound standards-based instructional materials, and professional development to support teachers in implementation of standards-based instruction and assessment strategies.

Mathematics provides a good example of the challenge of standards-based learning. The Vermont Framework of Standards and Learning Opportunities and the National Council of Teachers of Mathematics’ Standards for School Mathematics call for topics such as algebra, geometry, and statistics to be incorporated in the curriculum at developmentally appropriate levels K-12. At the same time, the standards call for increased emphasis on conceptual understanding and problem solving in math instruction and assessment. The Framework, the National Science Education Standards, and the National Educational Technology Standards pose similar challenges in science and technology.

Careful selection of published programs and materials can provide a solid foundation for a standards-based program and can increase the time available for teachers to focus on building content, instruction, and assessment expertise. As educators consider selection of standards-based materials to help meet these demands, they must move beyond traditional textbook adoption procedures. The model presented below reflects the experience of Vermont schools and districts in selecting standards-based materials and planning for implementation.

Step 1 – Carefully review the standards for the content area. Based on this review, consider the present curriculum. Identify key reasons for selecting published materials. To the degree possible, involve all teachers, administrators, parents, and community members in reaching consensus on the reasons that these materials are needed. Use these reasons to develop a rationale linked explicitly to the standards. Present the rationale to the Superintendent and School Board.

Step 2 – Convene a Selection Committee, ideally including teachers, school and district leadership, and parents. Develop a clear charge for the selection committee: for example, are they to recommend materials to the principal or superintendent, or are they expected to make the decision?

Step 3 – Develop a communication plan so that staff, parents, and leadership know the status of the review throughout the process. Follow the plan – in other words, communicate!

Step 4 – Develop criteria for selection based on the rationale. Share these criteria as the first test of your communication plan and revise the plan based on input received. For an example of criteria, see the questions below and visit the curriculum section of VISMT’s Web site at this address: www.vismt.org/curriculum

Step 5 – Review all materials under consideration. A helpful publication, Published Science, Mathematics, and Technology Programs that Fully Align with Vermont’s Framework of Standards and Learning Opportunities, may be viewed or downloaded from the VISMT Web site. Reviews will be added and updated on the Web site as new and revised materials emerge. Based on your review, narrow the focus to two or three programs.

Step 6 – Pilot lessons or units from the programs under review. Ideally each teacher will pilot at least one lesson or unit from each program under consideration. This helps to avoid teachers championing the single program with which they are familiar.

When piloting, remember that new material and techniques may seem awkward because they are unfamiliar. Before piloting, discuss the teaching and assessment approaches used in each program. If possible, visit a teacher who is experienced in using the program before piloting. VISMT has tapes available for this purpose if "live" observation is not possible.

Step 7 – Following the pilot, the Selection Committee should discuss the piloting experience and plan ways to share their experience. One successful way is to sponsor a “math or science night” during which teachers, administrators, board members, and community members experience the various curriculums as students.

Step 8 – Based on the criteria you establish, the review, the piloting process, and input you have received, select a program or make a recommendation, depending on your process.
A final comment: selecting a program is an important decision, but success in standards-based learning depends on implementation. Research studies, including the TIMSS study and the Pittsburgh Everyday Math study, consistently indicate that strong curriculum programs with weak support for implementation fail. The same programs properly implemented succeed. Detailed discussion of the characteristics of a successful implementation is beyond the scope of this article, but investment in professional development, in time for math and science, in using data to improve student performance, in leadership support, and in other key phases of implementation is crucial. Properly implemented standards-based programs can yield great dividends for student learning. The result more than justifies the investment.

**Criteria for Selecting Standards-Based Curriculum Materials**

**I. Judging Pedagogical Appropriateness**

**Addressing the Goals of Teaching and Learning**

1. Do the materials focus on concrete experience with content-specific phenomena?
2. Do the materials enable students to investigate important concepts in depth over an extended period of time?
3. Do the curriculum materials contribute to the development of reasoning, problem solving, and other process skills?
4. Do the materials stimulate students’ interest and relate learning to daily life?
5. Do the materials build conceptual understanding over several lessons through a logical sequence of related activities?
6. Does the instructional sequence include opportunities to assess students’ prior knowledge and experience?

**Focusing on Inquiry and Activity as the Basis of Learning Experiences**

1. Does the material focus on student inquiry and engage students in the processes of the content area?
2. Does the material provide opportunities for students to gather and defend their own evidence and express their results in a variety of ways?

**Using an Effective Instructional Approach**

1. Does the material focus on student inquiry and engage students in the processes of the content area?
2. Does the material incorporate effective strategies for the teacher and/or students to use in assessing student learning?
3. Does the teacher’s guide suggest opportunities for integrating with other areas of the curriculum?
4. Do students have opportunities to work collaboratively and alone?

**II. Judging Content**

1. Is the content current and accurately represented?
2. Does the content emphasize inquiry?
3. Is the content consistent with state and national standards?
4. Does the background material for teachers address the content that is taught, as well as common misconceptions?
5. Is the treatment of content appropriate for the grade level?
6. Is the content free of bias?
7. Is the writing style for students and teachers interesting and engaging, and is the language used appropriately?
8. Is vocabulary used to facilitate understanding rather than as an end in itself?
9. Is the content represented as an enterprise connected to society?

**III. Judging Presentation and Format**

1. Are the print materials for students well written, developmentally appropriate, and compelling in content?
2. Are the directions for implementing activities clear in both the teacher’s guide and student materials?
3. Are the suggestions for instructional delivery in the teacher’s guide adequate?
4. Are the materials free of ethnic, cultural, racial, economic, age, and gender bias?
5. Are appropriate strategies provided to meet the special needs of diverse populations?
6. Are lists of materials for each activity provided, as well as a complete set of materials and information about reasonably priced replacement materials?
7. Are safety precautions included where needed?
8. Are instructions for using laboratory equipment and materials clear and adequate?

## Systems

**Analysis - Standard 7.11** Students analyze and understand living and non-living systems (e.g., biological, chemical, electrical, mechanical, optical) as collections of interrelated parts and interconnected systems.

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<thead>
<tr>
<th>Pre K-4</th>
<th>5-8</th>
<th>9-12</th>
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<tbody>
<tr>
<td>DASH – Grades K-4</td>
<td>DASH – Grades 5, 6</td>
<td>Active Physics</td>
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<tr>
<td>FOSS</td>
<td>FAST</td>
<td>Applications in Biology/Chemistry</td>
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<tr>
<td>Insights</td>
<td>Facets</td>
<td>Biology: A Community Context</td>
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<tr>
<td>Science for Life and Living</td>
<td>FOSS</td>
<td>ChemCom</td>
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<tr>
<td>STC</td>
<td>Insights</td>
<td>BSCS Biology: A Human Approach</td>
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<td>Integrated Science-</td>
<td>Prime Science-Grades 9,10</td>
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<td>Grades 6,7,8</td>
<td>Science Links-Grade 9</td>
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<td>Prime Science-Grades 6,7,8</td>
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<td>Science 2000</td>
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<td>Science Interactions-</td>
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<td>Grades 6,7,8</td>
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<td>Science for Life and Living</td>
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<td>STC</td>
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## Physical Science (Space, Time, and Matter)

**Matter, Motion, Forces, & Energy - Standard 7.12** Students understand forces and motion, the properties and composition of matter, and energy sources and transformations.

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<tr>
<th>Pre K-4</th>
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<th>9-12</th>
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<tbody>
<tr>
<td>DASH – Grades K-4</td>
<td>DASH-Grades 5,6</td>
<td>Applications in Biology/Chemistry</td>
</tr>
<tr>
<td>FOSS - Balance and Motion, Solids and Liquids, Physics of Sound, Magnetism and Electricity, Fabric*</td>
<td>Facets-Food Substitutes</td>
<td>Active Physics</td>
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<td>Grades 6,7,8</td>
<td>Prime Science-Grades 9,10</td>
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<td>Science 2000</td>
<td>Science Links-Grade 9</td>
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<td>Science Interactions-</td>
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<td>Grades 6,7,8</td>
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<td></td>
<td>FOSS - Mixtures and Solutions, Levers and Pulleys*</td>
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<td>Science for Life and Living-Energy</td>
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<td>STC - Magnets and Motors, Food Chemistry</td>
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Appendix D

The Living World

Organisms, Evolution, & Interdependence - Standard 7.13 Students understand the characteristics of organisms, see patterns of similarity and differences among living organisms, understand the role of evolution, and recognize the interdependence of all systems that support life.

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<tr>
<th>Pre K-4</th>
<th>5-8</th>
<th>9-12</th>
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<tbody>
<tr>
<td>Science for Life and Living-Myself &amp; My World, Order, Change, Systems</td>
<td>DASH-Grades 5-6</td>
<td>Applications in Biology/Chemistry</td>
</tr>
<tr>
<td>FAST</td>
<td>Prime Science-Grades 6,7,8</td>
<td>Biology: A Community Context</td>
</tr>
<tr>
<td>DASH-Grades K-4</td>
<td>Science 2000</td>
<td>BSCS Biology: A Human Approach</td>
</tr>
<tr>
<td>STC - Organisms, Animal Studies, The Lifecycle of Butterflies, Plant Growth and Development</td>
<td>Science Interactions-Grades 6,7,8</td>
<td>Science Links</td>
</tr>
<tr>
<td>FOSS - Structures of Life, Animals Two by Two, Insects, Trees, New Plants</td>
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<tr>
<td>DASH-Grades 5-6</td>
<td>Prime Science-Grades 6,7,8</td>
<td>BSCS Biology: A Human Approach</td>
</tr>
<tr>
<td>STC – Microworlds, Experiments with Plants, Ecosystems*</td>
<td>Science Interactions-Grades 6,7,8</td>
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<tr>
<td>Insights – Reading the Environment*/**, There is No Away*</td>
<td>Science Interactions-Grades 6,7,8</td>
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<tr>
<td>FOSS – Environments*</td>
<td>Science Interactions-Grades 6,7,8</td>
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<tr>
<td>FOSS - Environments*</td>
<td>Science Interactions-Grades 6,7,8</td>
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The Human Body - Standard 7.14 Students demonstrate understanding of the human body - heredity, body systems, and individual development - and understand the impact of the environment on the human body.

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<tbody>
<tr>
<td>Insights - Myself and Others, The Senses</td>
<td>DASH-Grades 5,6</td>
<td>Active Physics</td>
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<tr>
<td>FOSS - Human Body</td>
<td>FOSS - Food and Nutrition</td>
<td>Applications in Biology/Chemistry</td>
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<tr>
<td>DASH-Grades K-4</td>
<td>Facets-Keeping Fit, Growing Older</td>
<td>Biology: A Community Context</td>
</tr>
<tr>
<td>Science for Life and Living-Myself &amp; My World, Order, Change, Systems</td>
<td>Prime Science-Grades 6,7,8</td>
<td>BSCS Biology: A Human Approach</td>
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<td>Prime Science-Grades 9,10</td>
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The Universe, Earth, and Environment

Theories, Systems, & Forces - Standard 7.15 Students demonstrate understanding of the earth and its environment, the solar system, and the universe in terms of the systems that characterize them, the forces that affect and shape them over time, and the theories that currently explain their evolution.

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<th>Pre K-4</th>
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Design and Technology

Natural Resources - Standard 7.16 Students understand how natural resources are extracted, distributed, processed, and disposed of.

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<th>Pre K-4</th>
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## Technological Systems - Standard 7.17

Students apply knowledge and understanding of technological systems to respond to a variety of issues.

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<th>Pre K-4</th>
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<tbody>
<tr>
<td>Science for Life and Living - My World, Order, Systems</td>
<td>Integrated Science-Grades 6,7,8</td>
<td>Active Physics</td>
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<td>Prime Science-Grades 6,7,8</td>
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<tr>
<td>Science 2000</td>
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<td>Prime Science-Grades 9,10</td>
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<tr>
<td>STC - The Technology of Paper*</td>
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<td>Science Links</td>
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<tr>
<td>Middle School Science &amp; Technology-Energy, Balance</td>
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## Outputs & Impacts - Standard 7.18

Students understand that people control the outputs and impacts of our expanding technological activities in the areas of communication, construction, manufacturing, power and transportation, energy sources, health technology, and biotechnology.

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<th>Pre K-4</th>
<th>5-8</th>
<th>9-12</th>
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<tbody>
<tr>
<td>Science for Life and Living - Systems</td>
<td>Prime Science-Grades 6,7,8</td>
<td>Active Physics</td>
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<td>FAST</td>
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<tr>
<td>Science 2000</td>
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<td>Applications in Biology/Chemistry</td>
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<td>Integrated Science-Grades 6,7,8</td>
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<td>Science Links</td>
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## Designing Solutions - Standard 7.19

Students use technological/engineering processes to design solutions to problems.

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<th>Pre K-4</th>
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<tbody>
<tr>
<td>DASH – Grades K-4</td>
<td>Insights-Structures</td>
<td>Active Physics</td>
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<tr>
<td>Insights - Lifting Heavy Things*</td>
<td>Integrated Science-Grades 6,7,8</td>
<td>Prime Science-Grades 10,11</td>
</tr>
<tr>
<td>STC - Motion and Design*</td>
<td>Prime Science-Grades 6,7,8</td>
<td>Science Links</td>
</tr>
<tr>
<td>Science for Life and Living - Systems</td>
<td>Science 2000</td>
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<tr>
<td>FOSS - Levers and Pulleys*</td>
<td>STC - Measuring Time*</td>
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<tr>
<td>STC - Models &amp; Designs</td>
<td>Insights - Structures*</td>
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</tbody>
</table>

For individual units from STC, FOSS, and Insights programs:

* Appears in more than one standard due to substantial content overlap.

** Appears in more than one grade level category due to grade level range.

**Abbreviations:**

STC = Science & Technology for Children

FOSS = Full Option Science System
Appendix D

Publishers/Contacts

CAROLINA BIOLOGICAL SUPPLY COMPANY
SCIENCE AND TECHNOLOGY FOR CHILDREN (Elementary Science)
Contact Gena Wofford at 1-800-227-1150 Ext. 5265.
www.carolina.com/STCpg.htm

DECISION DEVELOPMENT CORPORATION
SCIENCE 2000 (Middle School Science)
Contact by mail: Decision Development Corporation, 2680 Bishop Drive, San Ramon, CA 94583.
The fax number is 510-830-0830. Contact by telephone at 1-800-835-4332.
www.ddc2000.com

DELTA EDUCATION
DELTA SCIENCE MODULES (Elementary Science)
SCIS 3 (Elementary Science)
FOSS (Elementary Science)
Contact Lisa Wood at 1-800-237-8412 Ext. 114, or at: PO Box 915, Hudson, NH 03051.
email at majordomo@lists.mv.net
www.delta-ed.com

GLENCOE/McGRAW-HILL
INTERACTIVE, MATH, SCIENCE AND TECHNOLOGY (Middle School Math)
SCIENCE INTERACTIONS (Middle School Science)
TECHNOLOGY (Thode): (Middle and High School Technology)
Contact Richard Seefeldt at 1-800-297-4638 (access code: 17) or via e-mail at:
RSGlencoe@Berk.com
www.glencoe.com

INTERNATIONAL THOMPSON PUBLISHERS
BIOLOGY: A COMMUNITY CONTEXT: South-Western Publications (H.S. Science.)
These companies are under the "umbrella" firm of ITP.
Contact Steven Foley at Telephone: 1-617-287-0205 Fax:1-617-825-4825.
e-mail at sfoley@swpco.com

IT'S ABOUT TIME
ACTIVE PHYSICS www.activephysics.com
MATH CONNECTIONS www.mathconnections.com
Contact the company at 1-888-698-8463.
www.itsabouttime.com

KENDALL HUNT PUBLISHING COMPANY
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MIDDLE SCHOOL SCIENCE & TECHNOLOGY (Middle School Science)
FACETS (Middle School Science)
PRIME SCIENCE grs 6-10 (High School Science)
BSCS BIOLOGY: A HUMAN APPROACH (High School Science)
CHEMCON-CHEMISTRY (High School Science)
INSIGHTS IN BIOLOGY (High School Science)
*To make arrangements for K-8 materials contact Tricia Quade at 1-800-542-6657 Ext. 1125.
*To make arrangements for 9-12 materials contact Joe Haverland at 1-800-542-6657 Ext. 1120.
*www.kendallhunt.com

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SOUTH-WESTERN PUBLICATIONS
(see International Thompson Publishers ITP)
SCIENCE LINKS (High School Science)
UNIVERSITY OF ALABAMA
INTEGRATED SCIENCE (Middle School Science)
MATHEMATICS: MODELING OUR WORLD (High School Mathematics)
Contact Phyllis Workman at:
University of Alabama/CCET, Box 870167, Tuscaloosa, AL 35487-0167, or
call her at 1-800-477-8151.
www.ccet.ua.edu

UNIVERSITY OF HAWAII
DASH (Elementary Science)
FAST (Middle School Science)
Contact the university at 1-800-799-8111.
www2.hawaii.edu/crdg
Appendix E

Selected Resources for Designing Standards-Based Units


Since publication of the first edition of this best-selling book in 1986, cooperative learning has become a widely accepted strategy in U.S. schools. Now, with increased research and development, properly designed groupwork has evolved into a powerful tool for teaching all students, especially those from diverse backgrounds. The time has come to bring teachers up-to-date on the latest developments in the field. *Designing Groupwork* combines easy-to-follow theory with examples and teaching strategies that are adaptable to any situation. The advantages and dilemmas of groupwork are discussed, as are it’s use in multiability and bilingual classrooms, and step-by-step approaches to successful planning, implementation, and evaluation of groupwork activities.


Design a seamless learning program that teaches students how to grasp broad concepts and integrate the information they learn. Erickson offers specific strategies for curriculum design, instruction, and evaluation to help create such a program. You’ll find details on developing concept/process curriculum in a single discipline, in interdisciplinary units, and across grade levels. You’ll also learn how to align your curriculum with state and national standards, generate "big idea" topics, and establish appropriate performance assessments.


How can you bring standards to life and reality in your classroom? This guide is for teachers who seek a model and processes for designing standards-based units of study to use in their classrooms. Harris and Carr share their experiences with standards-based learning and offer practical examples of how to develop standards into units of study. The model and processes they describe in this book help readers in choosing and coordinating standards, topics, products and performances, assessment criteria, exemplars, and scoring guides.


The fifth edition of *Models of Teaching* covers the rationale of and research on the major well-researched models of teaching and illustrates K-12 classroom use through scenarios and examples of instructional materials.


This book describes the Dimensions of Learning program, a comprehensive K-12 instructional framework that teachers can use to improve the way they plan instruction, design curriculum, and assess student performance.
Appendix E


*Learning in Overdrive,* developed by and for busy teachers, shows how to begin with standards to create rich units of instruction. Lists, forms, and samples provide tools to plan and implement interdisciplinary units.


These teacher training materials focus on concrete tools and examples for designing effective instruction focused on identified learnings for students.


States and districts are adopting new standards. Now what? The promise of the standards movement will accomplish nothing if it does not lead to changes in the classroom, school, and district. How do you transform these standards into reality? This book is a full-length manual that tells you how to implement standards—with a comprehensive step-by-step approach, extensive appendices, checklists, glossary, bibliography, and sample assignments and assessments.


Research for Better Teaching has synthesized much of the knowledge base on teaching in one practical and useful manual. This book that does justice to the complexity of great teaching. Jon Saphier and Robert Gower have divided the nuts and bolts of teaching into four areas:

- Management, which includes classroom routines and transitions, discipline, momentum, and getting students' attention;
- Instruction, which includes clarity, the principles of learning, and models of teaching;
- Motivation, which outlines teacher behaviors that establish high expectations for all, help with relationship building, and improve the classroom climate;
- Curriculum, which includes objectives, the learning experience, assessment, and curriculum design.
Appendix E


In this book, Grant Wiggins outlines design standards for performance-based assessments that promise students – no matter what their ability - clear and worthy performance targets, useful feedback, coaching, and the opportunity to progress toward excellence. Educative Assessment furnishes the information needed to design performance-based assessments, craft performance tasks that meet rigorous educational standards, score assessments fairly, and structure and judge student portfolios. It also shows how performance assessment can be used to improve curriculum and instruction, grading, and reporting, as well as teacher accountability. In addition, the book includes numerous design templates and flowcharts, strategies for design and troubleshooting, and myriad examples of assessment tasks and scoring rubrics that Wiggins has developed and repeatedly refined using feedback from clients in schools, districts, and state departments of education.


Wiggins and McTighe provide an outstanding framework for curriculum design and assessment in this book. As they explain, understanding is so much greater than simply knowing. Their six "facets" of understanding will enable students to really understand as the curriculum is "uncovered," rather than being "covered." Advocating that you "begin with the end in mind," the authors explain a design process that is backward to what most people do. You begin with the desired end result, followed by the development of assessment activities, asking "What would count as evidence of successful teaching?" Only after you do this do you begin to consider the design of units, activities, and actual plans. Helpful design tools that can be used throughout the process are also included.

Online Resources

http://www.state.vt.us/educ (Vermont Department of Education Homepage)

http://Putwest.boces.org/standards.html (An annotated list of K-12 internet sites with state and national educational standards)

http://www.dbweb.ed.state.vt.us/arb/ (Vermont Assessment Database: Supporting Local Program and Classroom Assessments)

http://www.mccrel.org/ (Mid-continent Research for Education and Learning)