**“Legacy” Competency Portfolio Requirements**

**HIGH SCHOOL SCIENCE AND TECHNOLOGY/ENGINEERING**–Portfolios submitted for the CD in STE must reflect the *Massachusetts Science and Technology/Engineering High School Standards* (January 2006).

Portfolios may be submitted/resubmitted beginning in grade 9, and must be based on **one** of the following disciplines:

* Biology
* Chemistry
* Introductory Physics
* Technology/Engineering

In order to be considered for the CD, a high schoolSTE portfolio must include evidence that a student has addressed and demonstrated knowledge and skills in a total of **at least** **ten standards** **in the selected discipline** **(**with evidence of at least *one standard* addressed in each topic). Portfolios must reflect the *Massachusetts Science and Technology/Engineering High School Standards* (January 2006) and demonstrate work by the student at a level comparable with that of students who have passed the standard MCAS test in the discipline.

The portfolio must include the following information and materials:

* work samples createdby the student that demonstrate all aspects of standards selected for the discipline and topic
* a completed **High School STE Competency Portfolio Work Description** attached to each work sample (or collection of related work samples) produced for the portfolio
* a score (percent accurate) given by the teacher for each work sample. Work samples must be produced as independently as possible by the student, with all corrections clearly marked. Work samples may not be corrected by the teacher and submitted as the student’s own work.
* written evidence of the student’s thinking and problem-solving indicating the process used to solve each problem (i.e., show all student work)
* a clear indication of the type(s) and frequency of assistanceprovided to the student by the teacher (i.e., percent independence and any accommodations used by the student), either written directly on each piece or described on the High School Competency Portfolio Work Description
* submission of multiple-choice, matching, or fill-in-the-blank worksheets is strongly discouraged.

Topics in each STE discipline are listed in the following tables. In the discipline selected for the portfolio, *all* topics must be addressed, with evidence of at least *one standard* in each topic, and a total of *ten standards* in all.

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| --- | --- | --- |
| BIOLOGY |  | INTRODUCTORY PHYSICS |
| Topics: | Topics: |
| 1. The Chemistry of Life
 | 1. Motion and Forces
 |
| 1. Cell Biology
 | 1. Conservation of Energy and Momentum
 |
| 1. Genetics
 | 1. Heat and Heat Transfer
 |
| 1. Anatomy and Physiology
 | 1. Waves
 |
| 1. Evolution and Biodiversity
 | 1. Electromagnetism
 |
| 1. Ecology
 | 1. Electromagnetic Radiation
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| --- | --- | --- |
| CHEMISTRY |  | TECHNOLOGY/ENGINEERING |
| Topics: | Topics: |
| 1. Properties of Matter
 | 1. Engineering Design
 |
| 1. Atomic Structure and Nuclear Chemistry
 | 1. Construction Technologies
 |
| 1. Periodicity
 | 1. Energy and Power Technologies—Fluid Systems
 |
| 1. Chemical Bonding
 | 1. Energy and Power Technologies—Thermal Systems
 |
| 1. Chemical Reactions and Stoichiometry
 | 1. Energy and Power Technologies—Electrical Systems
 |
| 1. States of Matter, Kinetic Molecular Theory, and Thermochemistry
 | 1. Communication Technologies
 |
| 1. Solutions, Rates of Reaction, and Equilibrium
 | 1. Manufacturing Technologies
 |
| 1. Acids and Bases and Oxidation-Reduction Reactions
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Work samples generated during one or more of the following activities must be provided in the portfolio that document the student’s scientific knowledge, skills, and understanding in the selected discipline at the grade 9 or 10 level, as identified by the 2006 Massachusetts *Science and Technology/ Engineering High School Standards*:

* conducting investigations:
	+ For example, the student engages in exploratory activities in which he or she identifies a key question, designs a process for gathering information and investigating the question, and incorporates scientific knowledge to produce a response, inference, conclusion, or analysis of findings.
* performing laboratory experiments:
	+ For example, the student develops a hypothesis, designs or identifies a procedure for testing the hypothesis, performs a controlled experiment or series of trials, collects data accurately, summarizes and analyzes the results, and draws conclusions.
* conducting research:
	+ For example, the student undertakes an activity in which he or she locates and applies available scientific knowledge and/or data from texts, articles, research summaries, etc., in order to describe a process or aspect of the discipline and provides a synthesis of the knowledge acquired, supportable conclusions, and an analysis of findings.
* conducting data analysis:
	+ For example, the student accurately collects data generated either by the student, class, or teacher or data compiled from external sources and describes, synthesizes, and analyzes the data to articulate patterns, explain relationships between variables, and draw conclusions.
* completing an independent writing activity:
	+ For example, the student writes a persuasive essay or answers a series of guided open-response questions that provide an analysis of scientific materials or data in support of a particular conclusion or point of view.
* developing a scientific model to represent a natural system:
	+ For example, the student relates and explains how components of a natural system work together and creates a visual representation of that model.
* solving a technology/engineering design problem by creating a model or prototype:
	+ For example, the student demonstrates technical knowledge and an understanding of the steps of the Engineering Design Process by describing a particular design challenge, analyzing relevant information, making predictions, and developing a prototype or model to test the predictions.

For further guidance in planning instructional activities, refer to the actual high school standards, the Scientific Inquiry Skills Standards, and the Steps of the Engineering Design Process in the *Massachusetts Science and Technology/Engineering Curriculum Framework* (*January 2006*).