

## Field 86: Master Technology Teacher Test Framework

| <b>Domain</b>                                 | <b>Range of Competencies</b> |
|---|------------------------------|
| I. DIGITAL TECHNOLOGY KNOWLEDGE AND SKILLS    | 001–004                      |
| II. TECHNOLOGY-ENHANCED TEACHING AND LEARNING | 005–008                      |
| III. COLLABORATING AND MENTORING              | 009–010                      |

## Field 86: Master Technology Teacher Test Framework

### Domain I Digital Technology Knowledge and Skills (approximately 30% of the test)

#### Standards Assessed:

**Standard III:** The Master Technology Teacher applies knowledge of digital learning competencies including Internet research, graphics, animation, Web site mastering, and video technology.

### Domain II Technology-Enhanced Teaching and Learning (approximately 40% of the test)

#### Standards Assessed:

**Standard I:** The Master Technology Teacher effectively models and applies classroom teaching methodology and curriculum models that promote active student learning through the integration of technology and addresses the varied learning needs of all students.

**Standard II:** The Master Technology Teacher selects and administers appropriate technology-related assessments on an ongoing basis and uses the results to design and improve instruction.

**Standard III:** The Master Technology Teacher applies knowledge of digital learning competencies including Internet research, graphics, animation, Web site mastering, and video technology.

**Standard IV:** The Master Technology Teacher serves as a resource regarding the integration of assistive technologies and accessible design concepts to meet the needs of all students.

### Domain III Collaborating and Mentoring (approximately 30% of the test)

#### Standards Assessed:

**Standard V:** The Master Technology Teacher facilitates appropriate, research-based technology instruction by communicating and collaborating with educational stakeholders; mentoring, coaching, and consulting with colleagues; providing professional development opportunities for faculty; and making decisions based on converging evidence from research.

## Field 86: Master Technology Teacher Test Framework

### DOMAIN I—DIGITAL TECHNOLOGY KNOWLEDGE AND SKILLS

#### Competency 001

**The Master Technology Teacher demonstrates knowledge and application of technology-related terminology and concepts, hardware, software, data-input strategies, and ethical practices, and knows how to acquire, analyze, and evaluate digital information from the Internet and other sources.**

The Master Technology Teacher:

- Knows technology-related terminology and concepts.
- Demonstrates an understanding of the appropriate use of hardware components and software applications.
- Knows how to use input and output devices when using selected digital technologies (e.g., text, graphics, animation, video, sound, Internet applications).
- Identifies and demonstrates knowledge of how to create, use, manipulate, and exchange digital file formats (e.g., text, image, video, audio) between applications and/or platforms.
- Demonstrates knowledge of criteria (e.g., quality, appropriateness, effectiveness, efficiency) for evaluating productivity and authoring tools for selection, acquisition, and use.
- Knows how to facilitate the use of integrated technologies in foundation and enrichment curricular content.
- Demonstrates knowledge and application of strategies for searching (e.g., keyword, Boolean, natural, language), locating, and acquiring information from electronic resources (e.g., collaborative software, the Internet, intranets).
- Knows how to organize, store, and retrieve electronic information found in various formats (e.g., text, graphic, video, audio).
- Knows how to identify and evaluate information acquired from primary and secondary sources for accuracy, relevancy, and content validity by accessing, researching, and comparing data from multiple sources (e.g., the Internet, encyclopedias, databases).
- Demonstrates knowledge of the acceptable use of electronic information and products while in an individual classroom, lab, or on the Internet or an intranet.
- Demonstrates knowledge of copyright laws and violations and of ethical issues (e.g., fair use, patents, and trademarks; computer hacking; computer piracy; computer vandalism; intentional virus setting; invasion of privacy) when using, manipulating, and/or editing electronic data.

**FIELD 86: MASTER TECHNOLOGY TEACHER  
TEST FRAMEWORK**

- Knows how to obtain and cite the source of print and digital information from a variety of resources (e.g., the Internet; encyclopedias; databases; libraries of images in a variety of formats including text, audio, video, and graphics).
- Demonstrates respect for intellectual property and understands the ethical acquisition and use of digital information (e.g., citing sources using established methods).

**Competency 002**

**The Master Technology Teacher knows and applies basic strategies and techniques for using graphics and animation.**

The Master Technology Teacher:

- Knows basic elements of graphic design (e.g., proportion, balance, color, variety, emphasis, harmony, symmetry, unity) and how to apply these concepts to communicate effectively and assist students and educators in the creation of products.
- Demonstrates knowledge of basic concepts related to computer animation (e.g., storyboarding, timeline, color depth, layers, animated GIFs, frames, keyframes, tweening, object behaviors).
- Knows techniques for editing, manipulating, and changing sounds that have been captured from a variety of sources (e.g., audio CD, tape, microphone).
- Uses appropriate digital editing tools and design principles to import and edit images from a variety of sources (e.g., encyclopedias, databases, image libraries).
- Knows how to define the design attributes and requirements of products created for a variety of purposes (e.g., posters, stationery, brochures, slideshows, Web pages, multimedia presentations).

**FIELD 86: MASTER TECHNOLOGY TEACHER  
TEST FRAMEWORK**

**Competency 003**

**The Master Technology Teacher knows and applies basic strategies and techniques related to Web site mastering.**

The Master Technology Teacher:

- Demonstrates knowledge of mechanisms for navigating, accessing, transferring, sharing, and storing Web-based information across networks (e.g., intranets, the Internet).
- Knows how to create and edit Web pages using appropriate tools, design principles (e.g., size and type of graphic files, font size and color, backgrounds), and page elements (e.g., hyperlinks, HTML tags, alt tags for accessibility).
- Knows how to establish and access a folder/directory hierarchy for the management of a Web site and its related files.
- Demonstrates knowledge of network security and access issues (e.g., firewalls, password controls) related to the maintenance of a Web site.

**Competency 004**

**The Master Technology Teacher knows and applies basic strategies and techniques for using digital video technology.**

The Master Technology Teacher:

- Demonstrates knowledge of basic concepts relating to video technology (e.g., analog, digital) and understands differences and similarities between linear and nonlinear editing.
- Demonstrates knowledge of basic concepts of video filming (e.g., composition, ratio of image to frame, position in frame, line of gaze, pans/tilts, movement, perspective).
- Knows a variety of basic video techniques (e.g., zoom, focus, filters) and lighting techniques (e.g., key, fill, backlight) and how to use incident/reflected light, color temperatures, and filters.
- Demonstrates knowledge of compression schemes for a variety of file types (e.g., photographs, animation, audio, video, graphics) and knows compression strategies, programs, and techniques to conserve memory and retain image integrity when digitally capturing files.
- Knows how to use techniques for capturing and editing audio components during the video production process.
- Demonstrates knowledge of techniques used in postproduction (e.g., editing and creating control and/or time coded tracks; creating transitions, captions, and titles; applying 2-D and 3-D animation effects).
- Knows how to convert between analog video and digital video.

**FIELD 86: MASTER TECHNOLOGY TEACHER  
TEST FRAMEWORK**

**DOMAIN II—TECHNOLOGY-ENHANCED TEACHING AND LEARNING**

**Competency 005**

**The Master Technology Teacher demonstrates knowledge of how to use task-appropriate tools to synthesize knowledge, create and modify solutions, and evaluate results to support the work of individuals and groups in problem-solving situations.**

The Master Technology Teacher:

- Knows how to use and integrate appropriate technology-based productivity tools (e.g., word processor; database; spreadsheet; telecommunications; draw, paint, and utility programs) into teaching and learning.
- Knows how to facilitate the use of appropriate digital editing tools and design principles for classroom use (e.g., consistency; repetition; alignment; proximity; ratio of text to white space; image file size; color use; font type, size, and style).
- Knows how to use research skills and electronic resources and communication to synthesize information.
- Applies methods for extending the learning environment beyond the classroom through the creation and sharing of electronically formatted and published documents via electronic networks.
- Knows how to accomplish tasks through technological collaboration to include participation with electronic communities as student, initiator, contributor, and teacher/mentor.
- Knows how to create specifications and instructions (e.g., hardware/software requirements, instructions for use) for technology-based tasks.
- Knows how to use technology applications to facilitate the evaluation of work, including both process and product.
- Knows how to create rubrics to evaluate technology-based processes and products against established criteria.

## FIELD 86: MASTER TECHNOLOGY TEACHER TEST FRAMEWORK

### Competency 006

**The Master Technology Teacher demonstrates knowledge of how to communicate in different formats for diverse audiences.**

The Master Technology Teacher:

- Knows how to select, format, and present media activities and projects appropriate for the content, purpose, audience, and environment.
- Demonstrates knowledge of criteria for evaluating the design and functionality of interactive media (e.g., intended audience, content delivery, ease of navigation and interaction).
- Knows how to use productivity tools (e.g., spreadsheets, databases, word processors, graphics applications) to communicate effectively.
- Knows how to select and use various presentation formats (e.g., slide shows, posters, multimedia presentations, newsletters, brochures, reports) to communicate effectively.
- Knows how to publish information in a variety of formats (e.g., printed copy, monitor displays, Internet documents, video).
- Knows the characteristics, purposes, and protocols for using a variety of electronic communication tools (e.g., e-mail, Internet browsers, video-conferencing, distance-learning tools, discussion forums).
- Demonstrates knowledge of strategies for evaluating the effectiveness of communication in terms of both process and product.

### Competency 007

**The Master Technology Teacher demonstrates knowledge of instructional design, development, and assessment in a technology-enhanced environment.**

The Master Technology Teacher:

- Knows components of effective instructional design (e.g., eliciting and using prior knowledge, synthesizing prior and new knowledge, integrating knowledge and skills, applying accessibility concepts, providing scaffolded instruction, planning reviews) in a technology-enhanced environment.
- Knows characteristics and uses of types of technology-related assessments (e.g., performance-based, in-depth, continuous progress monitoring, summative evaluation) and how to facilitate the evaluation of students' knowledge and skills using technology-related assessment methods.
- Knows how to use formal and informal assessments to evaluate students' technology proficiencies.
- Knows fundamental characteristics of quantitative and qualitative assessments and understands how to use these assessments appropriately to plan and develop instruction.
- Demonstrates knowledge of fundamental assessment-related issues, such as those related to bias, reliability, and validity.

**FIELD 86: MASTER TECHNOLOGY TEACHER  
TEST FRAMEWORK**

- Demonstrates knowledge of the benefits and limitations of technology as applied to the assessment process.
- Demonstrates knowledge of the reciprocal nature of assessment, planning, and instruction.
- Knows how to facilitate ongoing student self-assessment in the use of technology, including both process and product.
- Demonstrates knowledge of appropriate research-based strategies and instructional methods for addressing the various technology knowledge and skill levels of students.
- Demonstrates knowledge of effective methods for incorporating technology into various instructional strategies (e.g., direct instruction, cooperative, project-based) to maximize student learning and teacher effectiveness.
- Demonstrates knowledge of theories and factors that affect learning in technology-enhanced environments (e.g., students' developmental stages and characteristics).
- Demonstrates knowledge of current research on and strategies for planning and designing classroom learning environments that effectively integrate technology, including available assistive technologies and accessible design concepts for electronic media development.
- Identifies and critically reviews sources of information about convergent research on integrating technology into the curriculum.
- Knows how to facilitate the use of integrated technologies in foundation and enrichment curricular content.
- Knows how to facilitate the preproduction, production, distribution, and use of student and educator products.
- Knows how to analyze and apply current convergent research on teaching and learning with technology to plan and design developmentally appropriate learning experiences that use technology-enhanced instructional strategies.
- Knows how to use technology to develop student collaboration skills to propose, assess, implement, and communicate solutions to real-world problems.
- Knows and applies effective classroom-management strategies in technology-enhanced environments.

**FIELD 86: MASTER TECHNOLOGY TEACHER  
TEST FRAMEWORK**

**Competency 008**

**The Master Technology Teacher knows how to implement and assess technology-enhanced instruction to meet the diverse needs and abilities of all students.**

The Master Technology Teacher:

- Identifies appropriate information resources and current research to support student-centered decisions about technology-based solutions and current research.
- Knows how to collaborate with classroom teachers and other staff to link student needs and abilities with appropriate technologies.
- Demonstrates familiarity with issues and resources relating to equity and access.
- Demonstrates knowledge of a variety of technology-based tools, including assistive and instructional technologies, that promote learning for all students.
- Demonstrates knowledge of assistive technology as defined by state and federal regulations.
- Recognizes that technology may be assistive, instructional, or both, depending on a student's instructional and developmental needs.
- Knows that decisions about assistive technology for students are required by law to be made by the admission, review, and dismissal (ARD) committee or Section 504 Committee and identifies personnel who are responsible for assistive-technology decisions.
- Knows how to facilitate the implementation of developmentally appropriate learning experiences that use technology-enhanced instructional strategies to support the diverse needs and abilities of all students.
- Knows how to plan and design activities and products that are accessible to students with diverse needs and abilities.

**FIELD 86: MASTER TECHNOLOGY TEACHER  
TEST FRAMEWORK**

**DOMAIN III—COLLABORATING AND MENTORING**

**Competency 009**

**The Master Technology Teacher knows how to collaborate with colleagues to facilitate the implementation of appropriate, research-based, technology-enhanced instruction.**

The Master Technology Teacher:

- Knows the roles of the Master Technology Teacher as teacher, collaborator, and mentor in the school community.
- Demonstrates an understanding of the leadership, communication, and facilitation skills and strategies necessary for effecting positive change in the school technology program and technology instruction.
- Knows and understands principles, guidelines, and ethical standards regarding collegial and professional collaborations, including issues related to confidentiality.
- Collaborates with administrators, colleagues, parents/guardians, and other members of the school community to ensure ongoing communication related to technology-enhanced teaching and learning.
- Collaborates with colleagues who have varying levels of skill, experience, and/or diverse philosophical approaches related to technology integration.
- Collaborates with colleagues to develop strategies for integrating technology-enhanced instruction into diverse learning environments and for implementing a system for monitoring the effectiveness of integration efforts.
- Promotes interest, inquiry, analysis, collaboration, and creativity for integrating evolving technologies that transform teaching and learning processes.
- Collaborates with members of the school community to evaluate, negotiate, and establish priorities regarding the use of technology in the schools.
- Selects and applies strategies to facilitate the growth of the learning community in technology-enhanced instruction (e.g., current and emerging technologies, instructional strategies, educational issues).

## FIELD 86: MASTER TECHNOLOGY TEACHER TEST FRAMEWORK

### Competency 010

**The Master Technology Teacher knows how to provide professional development and support through mentoring, modeling, coaching, and consulting.**

The Master Technology Teacher:

- Knows how to use formal and informal methods to assess educators' technology proficiencies and instructional strategies.
- Addresses the various technology knowledge and skill levels of educators by applying appropriate research-based strategies and instructional methods.
- Knows learning processes and procedures for facilitating adult learning.
- Demonstrates knowledge of the ways in which technology-enhanced, student-centered learning affects the role of the teacher (e.g., as mentor, facilitator, collaborator).
- Knows how to support educators' assessment of technology-enhanced learning.
- Selects and applies strategies to maximize effectiveness as a Master Technology Teacher, such as applying principles of time management and engaging in continuous self-assessment.
- Knows how to support ongoing educator self-assessment in the use of technology-enhanced instruction, including both process and product.
- Knows strategies for facilitating classroom teachers' acquisition and implementation of the knowledge and skills specified in the Technology Applications Standards I–V for all beginning teachers.
- Understands how to use mentoring, coaching, and consulting skills and strategies to facilitate team building for promoting student and educator use of technology in the teaching and learning environment.
- Uses mentoring, coaching, and consulting skills and strategies (e.g., observing, negotiating, providing feedback, problem solving) to support the use of technology in the teaching and learning environment.
- Uses consultation to engage in systematic problem solving for supporting effective student and educator use of technology.
- Promotes awareness of and support for technology-enhanced instruction in the learning community.
- Works with teachers, administrators, and others to identify professional development needs, promote support for professional-development programs, and advocate professional-development opportunities.
- Knows features of effective professional development that promote sustained application of technology-enhanced instruction in classroom practice (e.g., demonstration, modeling, guided practice, feedback, coaching, follow-up).