

Technology Guidelines

For Passing Standard 7 of the
Colorado Teacher Licensure Standards
Infusing Technology into P-12 Classrooms and
Learning Environments

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Resources:

Colorado Teacher Education Standards

ISTE National Educational Technology Standards (NETS) for Teachers

NCATE Teacher Preparation Standards

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What is the purpose and importance of technology in the classroom?

From toys to household appliances, technology is part of our world. In just the past few years, the Internet has gone from being a novelty to a driving force in our economy. Most of our P-12 students encounter technology as an everyday part of life and expect to use it in classrooms to support their learning. Our students must be prepared to work and become lifelong learners in a technology-rich environment. They must learn to adapt to the ever-changing expectations of our swiftly-moving economy if they are to become and remain productive members of society.

While most adults over the age of 30 grew up watching educational films and filmstrips, few ever experienced learning in a technology-enhanced environment. This means that the educational practices that most of us feel comfortable with do not involve technology. Without a mental picture of what technology infusion in a classroom looks like, it is a difficult task to create such an environment.

What is the nature of the Technology Guidelines?

The Technology Guidelines contain both technology skills that should be demonstrated and planning and teaching strategies that should be used every time you plan or teach a lesson. Other PBAs have incorporated technology standards and assessments, but you also must demonstrate that you have met all of the expectations in the Technology Guidelines.

What is the context for these Guidelines?

The attached Technology Guidelines are intended to provide the structure that teacher candidates, their instructors, and their supervising teachers need to develop a mental picture of a technology-infused classroom. It is based on Colorado Teacher Licensure Standard Seven, the work done by the state Standard 7 Task Force, International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS) for teachers and students, and NCATE standards for teacher licensure. It provides links between technological tools and Colorado Teacher Licensure standards and elements, guidelines for planning and implementing technology—infused instruction, and guidelines for where and when each element and definition should be assessed. The checklists enclosed in this PBA should be completed and placed in the PBA section of your licensure dossier.

How can I self-assess my readiness to begin these Guidelines and assess the progress I make throughout the program in preparing for my teaching license?

These Guidelines are a comprehensive technology assessment that provides a list of Standard 7 elements and definitions. Under each definition, there is an assessment and suggestions for how you might demonstrate your achievement of this part of the element definition. At the end of each element section, you will find a list of requirements for verifying that the element has been achieved at the proficient level. The letters in this part refer to the letters of the definitions. At the end of this list you will find a summary table you can use to conduct regular self-assessments and final verification as you approach licensure. You should list the document that verifies you have met each definition.

Technology Guidelines

In the pages that follow, you will find several types of information. The standard elements are listed with their number (7.1 – 7.5). Element definitions are lettered, following the element they define. Under each definition, there is an assessment and suggestions for how you might demonstrate your achievement of this part of the element definition. At the end of each element section, you will find a list of requirements for verifying that the element has been achieved at the Proficient level. The letters under each element refer to the same definitions letters below. At the end of this list you will find a summary table you can use to conduct regular self-assessments and final verification as you approach licensure.

STANDARD SEVEN: KNOWLEDGE OF TECHNOLOGY

The teacher is skilled in technology and is knowledgeable about using technology to support instruction and enhance student learning.

The teacher has demonstrated the ability to:

7.1 Apply technology to the delivery of standards-based instruction.

- A.** I identify computer-assisted instruction, video, audio, web, and other mediated resources appropriate to student needs and teaching methodologies aligned with selected standards and benchmarks.

Assessment: In planning, the TC identifies multiple resources that appear to be appropriate for the identified students and the standards/benchmarks selected. This list should include, at minimum, several computer-based, video-based, and web-based resources to be used for teacher planning and/or with students.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship preparation for teaching

- B.** Select appropriate media and resources for a unit/lesson to meet selected standards.

Assessment: The media selection choice reflects careful consideration of the content, cognitive, affective, and physical development of the students, resource availability in the partner school, and appropriate uses for that medium/resource.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship preparation for teaching

- C. Design and implement a management plan/strategy for a unit/lesson to ensure equitable use of the available technologies.

Assessment: Management plan/strategy allows all students to have access to the technologies used. Technology use is focused on learning and meeting standards, rather than as a reward for finishing early or only for sub-groups. (For example, the high group works on HyperStudio or the low group works on a drill. While this may occasionally be appropriate, the TC must be able to defend this choice based on learning theory and research and show that during the course of a unit/semester, all students have equitable access.) The TC must show flexibility of planning to accommodate for availability of one, several, or multiple technologies demonstrating that the TC does not see technology as an “add-on,” but as a tool to do something that could not be done without the technology.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship preparation for teaching

- D. Design and teach lessons or facilitate learning experiences that incorporate appropriate content-based technological resources (resources where the students use technology to locate information on the topics they are studying). These include but are not limited to:

- Computer-assisted instruction (CAI)
- Videotapes - commercial or taped from on-air productions
- Electronic resources - electronic encyclopedias, web resources
- Internet activity sites
- Teacher-developed resources - PowerPoint, HyperStudio, Kid Pix, slideshow, data bases, spreadsheets
- Interaction with experts via telecommunications
- Data gathering tools such as probes or Calculator-Based Labs (CBLs)

Assessment: TC develops unit/lesson plans that use at least one resources from the list. Depending on the age of the students and the technology available in the school, the resources may be accessed as a whole class or by individual students. TC should prepare appropriate data gathering tools to be used during the lesson/unit (individual student data sheet, overhead transparency, wall chart, data base, activity sheet). If CAI or videotapes are used to practice skills, this may not be necessary.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship experiences

- E. Design and teach lessons or facilitate learning experiences that incorporate appropriate technological tools.
- Video camera, editing equipment (advanced)
 - PowerPoint, Claris SlideShow, Kid Pix, HyperStudio
 - Overhead projector and manipulatives
 - Web authoring software

Assessment: TC plans and teaches a lesson/unit that requires the students to create a product using at least one of the tools from the list. This may be completed individually or in groups. With younger students, or as a model, the TC may create a project with the whole class. The completed project(s) demonstrate student progress toward a standard/benchmark. In other words, measurable learning took place. This was not just a time-consuming activity. In the case of overhead manipulatives, the product may be demonstrated student understanding of a principle or concept, support of a persuasive argument, or used by the student to build a position.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship experiences

Proficiency for Element 7.1: TC demonstrates each of the criteria to the following degree:

- A. Demonstrates at least once, possibly in the Work Sample, course work, or partner school planning.
- B. Selects appropriate media. Must select at least two different electronic resources, one of which must involve a computer (CAI, electronic tools, Internet).
- C. Demonstrates at least twice, possibly in the Work Sample, course work, or partner school planning.
- D. Demonstrates use of at least two of the listed resources.
- E. Demonstrates use of at least two of the listed resources.

7.2 Use technology to increase student achievement.

A. Design and teach lessons or facilitate learning experiences that incorporate appropriate technological tools and resources, and Colorado or district Information Literacy guidelines/standards in conjunction with a variety of instructional strategies, such as:

- Collaborative learning
- Self-directed learning
- Problem solving
- Individualized learning
- Higher-order thinking skills
- Distance and distributed learning

Assessment: TC plans and teaches lessons/units that use technology with at least one of the listed strategies. Technology and strategy must be used appropriately and match the student needs, skills, learning styles, ability levels, content, and standard/benchmark being taught.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship experiences

B. Identify and select computer-assisted instruction, video, audio, web, and other mediated resources and learning strategies appropriate to individualize instruction to meet each of the following student needs:

- Adapt instruction to different learning styles
- Address differences in student learning and performance
- Support learning for students with special needs
- Support learning for students whose primary language is not English
- Support student development of multiple learning styles

Assessment: TC plans and teaches lessons/unit or designs individual instructional opportunities that use technology for each of the listed needs.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship experiences

C. Make purposeful use of assistive technologies to enable all students, regardless of special needs, to participate in learning; know when and where to find assistance in helping students with special needs learn.

Assessment: TC plans and teaches lessons/unit or designs individual instructional opportunities that use assistive technologies. TC shows evidence of seeking assistance from multiple sources to select appropriate assistive technologies.

Suggested Opportunities: Special needs student case study, work sample or other PBAs, course assignments, internship experiences

Proficiency for Element 7.2: TC demonstrates each of the criteria to the following degree:

- A. Demonstrates at least twice using different technologies and/or strategies.
- B. Demonstrates meeting each of the five needs.
- C. Demonstrates at least twice (case study and one other).

7.3 Utilize technology to manage and communicate information.

A. Create an informational presentation and other forms of communication and use them to communicate with parents, colleagues, students, community members, national leaders, international peers, or content experts.

- Video/Audio
- PowerPoint, Claris SlideShow, Kid Pix
- Overhead transparencies
- Web authoring software
- Voice mail
- Word processing

Assessment: Form of communication selected is appropriate for the audience and the creator.

Suggested Opportunities: Research presentation, course assignments, internship experiences

B. Create and use a data base. The data base may be constructed using a word processor, data base program, spreadsheet, special task data base programs like EndNote, or test generator software (secondary). The data base might include:

- Student information
- Research data collected by or for students
- Professional information
- Inquiry data collected

Assessment: Data base contains appropriate and complete information. Fields will be appropriate for the data being collected.

Suggested Opportunities: Research project, course assignments, internship experiences

C. Use a data base to create personalized letters, report cards, or other communications with parents using the mail merge function of the word processor.

Assessment: At least five documents should be generated automatically using the mail merge feature. All information should appear in the appropriate places.

Suggested Opportunities: Research project, internship experiences

- D. Use text design principles (Williams, 1994) to create effective print-based materials such as newsletters, job aids, and instructional packets. Use APA style for academic reports and papers.

Assessment: The document will use the appropriate style and appear well-formatted and legible.

Suggested Opportunities: Research project, work sample and other PBAs, course assignments, internship experiences

Proficiency for Element 7.3: TC demonstrates each of the criteria to the following degree:

- A. Demonstrates use of at least four of the listed forms of communication.
- B. TC creates at least one data base for professional or instructional use.
- C. Demonstrates at least once.
- D. Each time TC creates a document, it will follow either APA style (academic reports, papers) or text design principles.

7.4 Apply technology to data-driven assessments of learning.

- A. Use a gradebook program and/or a partner school student information system to record attendance and calculate grades and progress toward meeting standards.

Assessment: The TC will record grades, attendance and other related student information in the clinical teacher's electronic gradebook or the school's student information system. The partner school will need to verify that each TC has received training in whichever system they use.

Suggested Opportunities: Internship experiences

- B. Create a spreadsheet to record and calculate grades and progress toward meeting standards.

Assessment: As part of a unit assessment of student progress, the TC will create a spreadsheet to record student progress and calculate grades. The spreadsheet must function correctly and give appropriate weight to each assignment.

Suggested Opportunities: Internship experiences

- C. Create and/or use a spreadsheet or data base to record and analyze assessment results.

Assessment: The TC will design and implement a system for recording and analyzing assessment data. The TC should select the tool based on the data being collected and develop appropriate formats for the data. This will most likely be part of a classroom research project.

Suggested Opportunities: Internship experiences, research project

- D. Use video and audio recorders to collect and analyze performance data.

Assessment: The TC will record student work. This may involve recording individual or group projects, individual reading, or class behavior during activities. The behaviors or work may be in the form of performances or natural behaviors. An analysis of what is being observed and its implications should be thoughtful and focus on the purpose of the observation, but not ignore unintended results.

Suggested Opportunities: Internship experiences, research project, work sample, special needs student case study, literacy checklist

E. Design assessments that incorporate appropriate technological tools.

- Video
- PowerPoint, Claris SlideShow, Kid Pix, HyperStudio
- Overhead projector and manipulatives
- Web authoring software

Assessment: As part of a unit, the TC will design assessments that require the students to produce a mediated product. A rubric for assessing the products will be complete and reflect the goals for producing the product.

Suggested Opportunities: Internship experiences, research project, work sample, literacy checklist

Proficiency for Element 7.4: TC demonstrates each of the criteria to the following degree:

- A. Partner school and clinical teacher verify that training has occurred and that the TC uses the system frequently (at least weekly while in a classroom).
- B. TC creates at least two spreadsheets. At least one must be used in a classroom setting.
- C. Demonstrates at least once.
- D. Demonstrates at least twice (case study, while teaching, classroom research, classroom management study, work sample)
- E. Demonstrates at least once.

7.5 Instruct students in basic technology skills.

A. TC knows and understands the six basic technology skills for K-12 students as defined by ISTE/NETS:

- Basic operations and concepts
- Social, ethical, and human issues
- Technology productivity tools
- Technology communications tools
- Technology research tools
- Technology problem-solving and decision-making tools

Assessment: Quiz or part of a larger test in course work.

Suggested Opportunities: Course assignments

B. I identify prerequisite technology skills for a given lesson.

Assessment: In any lesson/unit that uses technology, the TC will identify any prerequisite technology skills.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship preparation for teaching

C. Design and teach lessons to meet the prerequisite skills.

Assessment: In any lesson/unit that uses technology, the TC will design and teach lessons for any prerequisite technology skills. These lessons may be embedded in the lesson or unit rather than being stand-alone lessons.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship experiences

D. Design job aids/help sheets to support student use of technology.

Assessment: For any technological tool either used infrequently in the classroom or that is difficult to use, even though used frequently, the TC will design a job aid to allow the students, educational assistants, or volunteers to use the technology without having to ask for assistance. This may be integrated into a unit the TC is preparing or be developed to solve a general classroom problem.

Suggested Opportunities: Work sample or other PBAs, course assignments, internship preparation for teaching

Proficiency for Element 7.5: TC demonstrates each of the criteria to the following degree:

- A. Passes quiz or subtest with at least 90% correct.
- B. All lesson plans using technology must analyze prerequisite skills. Demonstrates at least twice.
- C. All lesson plans with prerequisite technology skills must include lessons. Demonstrates at least twice.
- D. Demonstrates at least once.

**Technology Guidelines
Self-Assessment and Verification Form**

Element and Definition	Level/Date/ Document	Level/Date/ Document	Level/Date/ Document	Verification
7.1 Apply technology to the delivery of standards-based instruction.				
A. I identify computer-assisted instruction, video, audio, web, and other mediated resources appropriate to student needs and teaching methodologies aligned with selected standards and benchmarks. (At least once)				
B. Select appropriate media and resources for a unit/lesson to meet selected standards. (Always selects appropriate media. Must select at least two different electronic resources, one of which must involve a computer.)				
C. Design and implement a management plan/strategy for a unit/lesson to ensure equitable use of the available technologies. (At least twice)				
D. Design and teach lessons or facilitate learning experiences that incorporate appropriate content-based technological resources (resources where the students use technology to locate information on the topics they are studying). (Demonstrates use of at least two of the resources listed on p. 5.)				
E. Design and teach lessons or facilitate learning experiences that incorporate appropriate technological tools. (Demonstrates use of at least two of the resources listed on p. 6).				

Notes:

Element and Definition	Level/Date/ Document	Level/Date/ Document	Level/Date/ Document	Verification
7.2 Use technology to increase student achievement.				
A. Design and teach lessons or facilitate learning experiences that incorporate appropriate technological tools and resources, and Colorado or district Information Literacy guidelines/standards in conjunction with a variety of instructional strategies. (Demonstrates at least twice using different technologies and/or strategies. See list on p7.)				
B. Identify and select computer-assisted instruction, video, audio, web, and other mediated resources and learning strategies appropriate to individualize instruction to meet each of the student needs listed on p. 7. (Demonstrates meeting each of the four needs.)				
C. Make purposeful use of assistive technologies to enable all students, regardless of special needs, to participate in learning; know when and where to find assistance in helping students with special needs learn. (Demonstrates at least twice.)				

Notes:

Element and Definition	Level/Date/ Document	Level/Date/ Document	Level/Date/ Document	Verification
7.3 Utilize technology to manage and communicate information.				
A. Create an informational presentation and other forms of communication and use them to communicate with parents, colleagues, students, community members, national leaders, international peers, or content experts. (Demonstrates use of at least four of the forms of communication listed on p. 9.)				
B. Create and use a data base. The data base may be constructed using a word processor, data base program, spreadsheet, special task data base programs like EndNote, or test generator software (secondary). (TC creates at least one data base for professional or instructional use.)				
C. Use a data base to create personalized letters, report cards, or other communications with parents using the mail merge function of the word processor. (Demonstrates at least once.)				
D. Use text design principles (Williams, 1994) to create effective print-based materials such as newsletters, job aids, and instructional packets. Use APA style for academic reports and papers. (Each time TC creates a document, it will follow either APA style (academic reports, papers) or text design principles.)				

Notes:

Element and Definition	Level/Date/ Document	Level/Date/ Document	Level/Date/ Document	Verification
7.4 Apply technology to data-driven assessments of learning.				
A. Use a gradebook program and/or a partner school student information system to record attendance and calculate grades and progress toward meeting standards. (Partner school and clinical teacher verify that training has occurred and that the TC uses the system frequently (at least weekly while in a classroom).)				
B. Create a spreadsheet to record and calculate grades and progress toward meeting standards. (TC creates at least two spreadsheets. At least one must be used in a classroom setting.)				
C. Create and/or use a spreadsheet or data base to record and analyze assessment results. (Demonstrates at least once.)				
D. Use video and audio recorders to collect and analyze performance data. (Demonstrates at least twice.)				
E. Design assessments that incorporate appropriate technological tools. (Demonstrates at least once.)				

Notes:

Element and Definition	Level/Date/ Document	Level/Date/ Document	Level/Date/ Document	Verification
7.5 Instruct students in basic technology skills.				
A. TC knows and understands the six basic technology skills for K-12 students as defined by ISTE/NETS. (Passes quiz or subtest with at least 90% correct.)				
B. I identify prerequisite technology skills for a given lesson. (All lesson plans using technology must analyze prerequisite skills. Demonstrates at least twice.)				
C. Design and teach lessons to meet the prerequisite skills. (All lesson plans with prerequisite technology skills must include lessons. Demonstrates at least twice.)				
D. Design job aids/help sheets to support student use of technology. (Demonstrates at least once.)				

Notes:

References

Williams, Robin (1994). *The non-designer's design book: Design and typographic principles for the visual novice*. Berkeley CA: Peachpit Press (510-548-4393; fax 510-548-5991). ISBN 1-56609-159-4.

Appendix

ISTE/NETS Technology Foundation Standards for All Students

The technology foundation standards for students are divided into six broad categories. Standards within each category are to be introduced, reinforced, and mastered by students. These categories provide a framework for linking performance indicators within the Profiles for Technology Literate Students to the standards. Teachers can use these standards and profiles as guidelines for planning technology-based activities in which students achieve success in learning, communication, and life skills.

Technology Foundation Standards for Students

1. Basic operations and concepts
 - Students demonstrate a sound understanding of the nature and operation of technology systems.
 - Students are proficient in the use of technology.
2. Social, ethical, and human issues
 - Students understand the ethical, cultural, and societal issues related to technology.
 - Students practice responsible use of technology systems, information, and software.
 - Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
3. Technology productivity tools
 - Students use technology tools to enhance learning, increase productivity, and promote creativity.
 - Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.
4. Technology communications tools
 - Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
 - Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
5. Technology research tools
 - Students use technology to locate, evaluate, and collect information from a variety of sources.
 - Students use technology tools to process data and report results.
 - Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.
6. Technology problem-solving and decision-making tools
 - Students use technology resources for solving problems and making informed decisions.
 - Students employ technology in the development of strategies for solving problems in the real world.