Telluride School District R1

*Instructional Technology Framework*

Awareness of the pressing need for technology skills among high school graduates headed for higher education, career training or the job market, has driven the development of a new K-12 Instructional Technology Framework. This Framework is a working document and describes what K-12 students must know and be able to do with technology. These new proficiencies are framed within a definition of basic literacy and its next level of skill development, technological fluency.


**Technology Literacy** is the ability to responsibly, creatively and effectively use appropriate technology to:

- Communicate.
- Access, collect, manage, integrate and evaluate information.
- Solve problems and create solutions
- Build and share knowledge.
- Improve and enhance learning in all subject areas and experiences.

**Technology Fluency** is demonstrated when students:

- Apply technology to real-world experiences.
- Adapt to changing technologies.
- Modify current and create new technologies.
- Personalize technology to meet personal needs, interests and learning style.
**Document Organization**

The educational technology standards are organized to map the learning proficiency sequence from kindergarten through 12th grade. Educators can see how a learning expectation differs from grade to grade across grade spans of K-12.

This Technology Framework has reorganized the six NETS_S into 2 areas: Integration and Digital Citizenship.

<table>
<thead>
<tr>
<th><strong>Integration</strong></th>
<th><strong>Digital Citizenship</strong></th>
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<tbody>
<tr>
<td>Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems.</td>
<td>Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior.</td>
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<td><strong>Components:</strong></td>
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<tr>
<td><strong>Innovate:</strong> Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology.</td>
<td><strong>Practice Safety:</strong> Practice safe, legal and ethical behavior in the use of information and technology.</td>
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<td><strong>Collaborate:</strong> Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others.</td>
<td><strong>Operate Systems:</strong> Understand technology systems and use hardware and networks to support learning.</td>
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<tr>
<td><strong>Investigate and Think Critically:</strong> Research, manage and evaluate information and solve problems using digital tools and resources.</td>
<td><strong>Select and Use Applications:</strong> Use productivity tools and common applications effectively and constructively.</td>
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<td></td>
<td><strong>Adapt to Change (Technology Fluency):</strong> Transfer current knowledge to new and emerging technologies. (Grades 6-12 only)</td>
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Understanding Grade Level Expectations

**Required:**
A broad statement of the learning that applies to Grades K–12 using ISTE NETS_S.

This is the NETS_S Standard and subset letters that apply to the performance indicators.

The **Grade Level (GL)** is a statement containing the essential content or process to be learned and the cognitive requirements to learn it. Each GL includes evidence of learning statements, which are considered essential to that grade level.

The **GL Numbering System** identifies the standard and the subset letters are the performance indicators. In the example at right, the number S1 indicates the 1st Standard and the letters indicate the student performance indicators.

The **Evidence of Learning** is a bulleted list of ways students can demonstrate learning considered essential to the GL. Educators are encouraged to identify additional ways in which the student can show proficiency as the educational technology standards are integrated across the curriculum.

The **Examples** provide specific illustrations of the learning. However, these examples are not exhaustive, and educators are encouraged to find multiple ways by which learners can demonstrate what they know. Examples may vary based on teacher input and feedback.

**INTEGRATION NETS_S 1-4:**
Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems.

**Creativity and Innovation**
Students demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. Students:

- **a.** Apply existing knowledge to generate new ideas, products or processes
- **b.** Create original works as a means of personal or group expression.

<table>
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<tr>
<th>GL</th>
<th>Evidence Of Learning</th>
<th>Examples</th>
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<tr>
<td>S1 ab</td>
<td>Generate ideas and create original works for personal and group expression using a variety of digital tools.</td>
<td>Use classroom technologies carefully and correctly.</td>
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<tr>
<td></td>
<td>- Organize ideas and produce digital products with assistance.</td>
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</table>

Use classroom technologies carefully and correctly.
Understanding the Examples

There are two types of examples given at each grade level in:
- **Basic Level**
- **21st Century Learning Environment**

### Basic Level

All TSD classrooms are equipped with at least one computer connected to the Internet; access to an LCD projector, mimio or Smartboard. Given this level of technology presence, all educators can reasonably use the examples, or their equivalent, at the Basic Level.

### 21st Century Learning Environment

For classrooms that have moved beyond the Basic Level, the 21st Century Learning Environment examples are intended to provide achievable outcomes using available technological tools. The long-term goal is to move all classroom instruction to 21st century learning environments with on-going professional development.

### Subject Area References

Examples also include suggested subject area or areas into which the technology standards could be integrated (R = Reading, W = Writing, M = Mathematics, Sc = Science, SS = Social Studies, C = Communication, A = The Arts, H/F = Health and Fitness, CTE = Career and Technical Education, WL = World Languages). TSD anticipates that each one of these will be linked on the TSD website to a high quality, standards-based lesson aligned to specific Grade Level Expectations or Performance Expectations for that subject area. All examples will be updated regularly as technology changes.

**Note:** Examples – **Digital Citizenship** – do not have suggested subject areas or Basic/21st Century examples.

**Note:** An empty, shaded box in an early grade or grades indicates that proficiency is not yet expected.
1. Creativity and Innovation
   Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:
   a. apply existing knowledge to generate new ideas, products, or processes.
   b. create original works as a means of personal or group expression.
   c. use models and simulations to explore complex systems and issues.
   d. identify trends and forecast possibilities.

2. Communication and Collaboration
   Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:
   a. interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
   b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.
   c. develop cultural understanding and global awareness by engaging with learners of other cultures.
   d. contribute to project teams to produce original works or solve problems.

3. Research and Information Fluency
   Students apply digital tools to gather, evaluate, and use information. Students:
   a. plan strategies to guide inquiry.
   b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
   c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
   d. process data and report results.

4. Critical Thinking, Problem Solving, and Decision Making
   Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:
   a. identify and define authentic problems and significant questions for investigation.
   b. plan and manage activities to develop a solution or complete a project.
   c. collect and analyze data to identify solutions and/or make informed decisions.
   d. use multiple processes and diverse perspectives to explore alternative solutions.

5. Digital Citizenship
   Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:
   a. advocate and practice safe, legal, and responsible use of information and technology.
   b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
   c. demonstrate personal responsibility for lifelong learning.
   d. exhibit leadership for digital citizenship.

6. Technology Operations and Concepts
   Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:
   a. understand and use technology systems.
   b. select and use applications effectively and productively.
   c. troubleshoot systems and applications.
   d. transfer current knowledge to learning of new technologies.
A major component of the NETS Project is the development of a general set of profiles describing technology (ICT) literate students at key developmental points in their precollege education. These profiles are based on ISTE’s core belief that all students must have regular opportunities to use technology to develop skills that encourage personal productivity, creativity, critical thinking, and collaboration in the classroom and in daily life. Coupled with the standards, the profiles provide a set of examples for preparing students to be lifelong learners and contributing members of a global society.

The profiles highlight a few important types of learning activities in which students might engage as the new NETS•S are implemented. These examples are provided in an effort to bring the standards to life and demonstrate the variety of activities possible. Space limitations and the realities of the constantly evolving learning and technology landscapes make it impossible to provide a comprehensive collection of examples in this document, and consequently, students and teachers should not feel constrained by this resource. Similarly, because this represents only a sampling of illuminating possibilities, the profiles cannot be considered a comprehensive curriculum, or even a minimally adequate one, for achieving mastery of the rich revised National Educational Technology Standards for Students. Educators are encouraged to stay connected to the ISTE NETS Refresh Project and contribute their best examples to expand this resource.

The profiles are divided into the following four grade ranges. Because grade-level designations vary in different countries, age ranges are also provided.

- Grades PK–2 (ages 4–8)
- Grades 3–5 (ages 8–11)
- Grades 6–8 (ages 11–14)
- Grades 9–12 (ages 14–18)

It’s important to remember that the profiles are indicators of achievement at certain stages in primary, elementary, and secondary education, and that success in meeting the indicators is predicated on students having regular access to a variety of technology tools. Skills are introduced and reinforced over multiple grade levels before mastery is achieved. If access is an issue, profile indicators will need to be adapted to fit local needs.

The standards and profiles are based on input and feedback provided by instructional technology experts and educators from around the world, including classroom teachers, administrators, teacher educators, and curriculum specialists. Students were also given opportunities to provide input and feedback. In addition, these refreshed documents reflect information collected from professional literature.
The following experiences with technology and digital resources are examples of learning activities in which students might engage during PK–Grade 2 (ages 4–8):

1. Illustrate and communicate original ideas and stories using digital tools and media-rich resources. (1, 2)
2. Identify, research, and collect data on an environmental issue using digital resources and propose a developmentally appropriate solution. (1, 3, 4)
3. Engage in learning activities with learners from multiple cultures through e-mail and other electronic means. (2, 6)
4. In a collaborative work group, use a variety of technologies to produce a digital presentation or product in a curriculum area. (1, 2, 6)
5. Find and evaluate information related to a current or historical person or event using digital resources. (3)
6. Use simulations and graphical organizers to explore and depict patterns of growth such as the life cycles of plants and animals. (1, 3, 4)
7. Demonstrate the safe and cooperative use of technology. (5)
8. Independently apply digital tools and resources to address a variety of tasks and problems. (4, 6)
9. Communicate about technology using developmentally appropriate and accurate terminology. (6)
10. Demonstrate the ability to navigate in virtual environments such as electronic books, simulation software, and Web sites. (6)
Profile
for Technology (ICT) Literate Students
Grades 3–5 (Ages 8–11)

The following experiences with technology and digital resources are examples of learning activities in which students might engage during Grades 3–5 (ages 8–11):

1. Produce a media-rich digital story about a significant local event based on first-person interviews. (1, 2, 3, 4)
2. Use digital-imaging technology to modify or create works of art for use in a digital presentation. (1, 2, 6)
3. Recognize bias in digital resources while researching an environmental issue with guidance from the teacher. (3, 4)
4. Select and apply digital tools to collect, organize, and analyze data to evaluate theories or test hypotheses. (3, 4, 6)
5. Identify and investigate a global issue and generate possible solutions using digital tools and resources. (3, 4)
6. Conduct science experiments using digital instruments and measurement devices. (4, 6)
7. Conceptualize, guide, and manage individual or group learning projects using digital planning tools with teacher support. (4, 6)
8. Practice injury prevention by applying a variety of ergonomic strategies when using technology. (5)
9. Debate the effect of existing and emerging technologies on individuals, society, and the global community. (5, 6)
10. Apply previous knowledge of digital technology operations to analyze and solve current hardware and software problems. (4, 6)

The numbers in parentheses after each item identify the standards (1–6) most closely linked to the activity described. Each activity may relate to one indicator, to multiple indicators, or to the overall standards referenced.

The categories are:

1. Creativity and Innovation
2. Communication and Collaboration
3. Research and Information Fluency
4. Critical Thinking, Problem Solving, and Decision Making
5. Digital Citizenship
6. Technology Operations and Concepts
The following experiences with technology and digital resources are examples of learning activities in which students might engage during Grades 6–8 (ages 11–14):

1. Describe and illustrate a content-related concept or process using a model, simulation, or concept-mapping software. (1, 2)

2. Create original animations or videos documenting school, community, or local events. (1, 2, 6)

3. Gather data, examine patterns, and apply information for decision making using digital tools and resources. (1, 4)

4. Participate in a cooperative learning project in an online learning community. (2)

5. Evaluate digital resources to determine the credibility of the author and publisher and the timeliness and accuracy of the content. (3)

6. Employ data-collection technology such as probes, handheld devices, and geographic mapping systems to gather, view, analyze, and report results for content-related problems. (3, 4, 6)

7. Select and use the appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. (3, 4, 6)

8. Use collaborative electronic authoring tools to explore common curriculum content from multicultural perspectives with other learners. (2, 3, 4, 5)

9. Integrate a variety of file types to create and illustrate a document or presentation. (1, 6)

10. Independently develop and apply strategies for identifying and solving routine hardware and software problems. (4, 6)

The numbers in parentheses after each item identify the standards (1–6) most closely linked to the activity described. Each activity may relate to one indicator, to multiple indicators, or to the overall standards referenced.

The categories are:

1. Creativity and Innovation
2. Communication and Collaboration
3. Research and Information Fluency
4. Critical Thinking, Problem Solving, and Decision Making
5. Digital Citizenship
6. Technology Operations and Concepts
The numbers in parentheses after each item identify the standards (1–6) most closely linked to the activity described. Each activity may relate to one indicator, to multiple indicators, or to the overall standards referenced. The categories are:

1. Creativity and Innovation
2. Communication and Collaboration
3. Research and Information Fluency
4. Critical Thinking, Problem Solving, and Decision Making
5. Digital Citizenship
6. Technology Operations and Concepts

The following experiences with technology and digital resources are examples of learning activities in which students might engage during Grades 9–12 (ages 14–18):

1. Design, develop, and test a digital learning game to demonstrate knowledge and skills related to curriculum content. (1, 4)
2. Create and publish an online art gallery with examples and commentary that demonstrate an understanding of different historical periods, cultures, and countries. (1, 2)
3. Select digital tools or resources to use for a real-world task and justify the selection based on their efficiency and effectiveness. (3, 6)
4. Employ curriculum-specific simulations to practice critical-thinking processes. (1, 4)
5. Identify a complex global issue, develop a systematic plan of investigation, and present innovative sustainable solutions. (1, 2, 3, 4)
6. Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, social, lifelong learning, and career needs. (4, 5, 6)
7. Design a Web site that meets accessibility requirements. (1, 5)
8. Model legal and ethical behaviors when using information and technology by properly selecting, acquiring, and citing resources. (3, 5)
9. Create media-rich presentations for other students on the appropriate and ethical use of digital tools and resources. (1, 5)
10. Configure and troubleshoot hardware, software, and network systems to optimize their use for learning and productivity. (4, 6)