North Dakota Science

Content and Achievement Standards

Standard 6

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North Dakota Department of Public Instruction

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Standard 6: Science and Technology

Standard 6: Students understand relations between science and technology.				
Benchmark Expectations	Proficiency Descriptor			
	Advanced Proficient	**Proficient**	**Partially Proficient**	**Novice**
Kindergarten				
Forms Of Technology				
K.6.1. Identify natural objects that differ from those made by humans (e.g., rock-brick, sun-light bulb)	Students identify natural objects that differ from those made by humans with no errors.	Students identify natural objects that differ from those made by humans with no significant errors.	Students identify natural objects that differ from those made by humans with few significant errors.	Students identify natural objects that differ from those made by humans with many significant errors.
K.6.2. Identify tools (e.g., scissors, pencil, hammer) that can be helpful or harmful	Students identify, with no errors, tools that can be helpful or harmful.	Students identify, with no significant errors, tools that can be helpful or harmful.	Students identify, with few significant errors, tools that can be helpful or harmful.	Students identify, with many significant errors, tools that can be helpful or harmful.
Grade 1				
Forms Of Technology				
1.6.1. Identify tools/inventions (e.g., computer, car, cell phone) that impact the way we live	Students identify an extensive variety of tools/inventions that impact the way we live.	Students identify a variety of tools/inventions that impact the way we live.	Students identify some different tools/inventions that impact the way we live.	Students identify few tools/inventions that impact the way we live.
Technological Design				
1.6.2. Use several steps to complete a task (e.g., building blocks, art project, group investigation)	Students use several steps to complete a task with accuracy.	Students use several steps to complete a task with no significant errors.	Students use several steps to complete a task with few significant errors.	Students use several steps to complete a task with many significant errors.
Grade 2				
Forms Of Technology				
2.6.1. Identify tools (e.g., ruler, hand lens, thermometer, balance) that are used to observe, measure, and investigate things they could not otherwise see, measure and do	Students identify an extensive variety of tools that are used to observe, measure, and investigate things they could not otherwise see, measure, and do.	Students identify a variety of tools that are used to observe, measure, and investigate things they could not otherwise see, measure, and do.	Students identify some different tools that are used to observe, measure, and investigate things they could not otherwise see, measure, and do.	Students identify few tools that are used to observe, measure, and investigate things they could not otherwise see, measure, and do.

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2.6.2. Explain how models (e.g., plastic animal figures, skeletal models) can be used to understand science	Students provide an insightful explanation how models can be used to understand science.	Students provide a reasonable explanation how models can be used to understand science.	Students provide a superficial explanation how models can be used to understand science.	Students provide an unreasonable explanation how models can be used to understand science.
Grade 3				
Forms of Technology *No benchmark expectations at this level* Technological Design				
3.6.1. Identify ways technology (e.g., zippers, Velcro, measuring instruments, computers) can be used to solve problems at home and school	Students identify an extensive variety of ways technology can be used to solve problems.	Students identify a variety of ways technology can be used to solve problems.	Students identify some different ways technology can be used to solve problems.	Students identify few ways technology can be used to solve problems.
Grade 4				
Technological Design				
4.6.1. Evaluate the effects of technology on people and the environment (e.g., new construction, oil drilling, electric cars)	Students give an insightful evaluation of the effects of technology on people and the environment.	Students give a reasonable evaluation of the effects of technology on people and the environment.	Students give a superficial evaluation of the effects of technology on people and the environment.	Students give an unreasonable evaluation of the effects of technology on people and the environment.
4.6.2. Explain how an invention may lead to other inventions	Students give an insightful explanation of how an invention may lead to other inventions.	Students give a reasonable explanation of how an invention may lead to other inventions.	Students give a superficial explanation of how an invention may lead to other inventions.	Students give an unreasonable explanation of how an invention may lead to other inventions.
Grade 5				
Technological Design				
5.6.1. Use technology to design a solution to a problem	Students use technology to design a creative solution to a problem.	Students use technology to design a reasonable solution to a problem.	Students use technology to design a superficial solution to a problem.	Students use technology to design an unreasonable solution to a problem.

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Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	**PROFICIENT**	**PARTIALLY PROFICIENT**	**NOVICE**
5.6.2. Evaluate a product or design using established criteria	Students evaluate, with accuracy, a product or design using established criteria.	Students evaluate, with no significant errors, a product or design using established criteria.	Students evaluate, with few significant errors, a product or design using established criteria.	Students evaluate, with many significant errors, a product or design using established criteria.
Grade 6				
TECHNOLOGICAL DESIGN				
6.6.1. Identify examples of how technologies have evolved	Students identify an extensive variety of examples of how technology has evolved.	Students identify many different examples of how technology has evolved.	Students identify some different examples of how technology has evolved.	Students identify few examples of how technology has evolved.
6.6.2. Design a product or solution to a problem given constraints (e.g., limits of time, costs, materials and environmental factors)	Students design a creative product or solution to a problem given constraints.	Students design a reasonable product or solution to a problem given constraints.	Students design a superficial product or solution to a problem given constraints.	Students design an unreasonable product or solution to a problem given constraints.
6.6.3. Explain the relationship between science and technology	Students explain, with no errors, the relationship between science and technology	Students explain, with no significant errors, the relationship between science and technology	Students explain, with few significant errors, the relationship between science and technology	Students explain, with many significant errors, the relationship between science and technology .
Grade 7				
TECHNOLOGICAL DESIGN *No benchmark expectations at this level*				
TECHNOLOGY AND SOCIETY				
7.6.1. Identify ways in which technology has influenced the course of history and improved the quality of life	Students identify an extensive variety of ways in which technology has influenced the course of history and improved the quality of life.	Students identify many different ways in which technology has influenced the course of history and improved the quality of life.	Students identify some different ways in which technology has influenced the course of history and improved the quality of life.	Students identify a limited variety of ways in which technology has influenced the course of history and improved the quality of life.
7.6.2. Identify technologies (e.g., communication, agriculture, information processing, transportation) that are influenced by societies	Students identify an extensive variety of technologies that are influenced by societies.	Students identify many different technologies that are influenced by societies.	Students identify some different technologies that are influenced by societies.	Students identify a limited variety of technologies that are influenced by societies.

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7.6.3. Identify intended benefits and unintended consequences that result from the development and use of technologies	Students identify all of the significant details of the benefits and consequences resulting from technologies.	Students identify most of the significant details of the benefits and consequences resulting from technologies.	Students identify some of the significant details of the benefits and consequences resulting from technologies.	Students identify few of the significant details of the benefits and consequences resulting from technologies.
Grade 8				
Technology And Society *No benchmark expectations at this level*				
Grade 9-10				
Technological Design				
9-10.6.1. Use appropriate technologies and techniques to solve a problem (e.g., computer-assisted tools, Internet, research skills)	Students use an extensive variety of appropriate technologies and techniques to solve a problem.	Students use a variety of appropriate technologies and techniques to solve a problem.	Students use some different appropriate technologies and techniques to solve a problem.	Students use few appropriate technologies and techniques to solve a problem.
9-10.6.2. Explain how scientific principles have been used to create common technologies (e.g., household appliances, automotive parts, agricultural equipment, textiles, fabrics, computers, Internet resources, CD-ROMs)	Students explain how scientific principles have been used to create an extensive variety of common technologies.	Students explain how scientific principles have been used to create a variety of common technologies.	Students explain how scientific principles have been used to create some different common technologies.	Students explain how scientific principles have been used to create few common technologies.
Technology And Society				
9-10.6.3. Explain how emerging technologies (e.g., genetic manipulation, biofuels, and hydrogen fuels) may impact society and the environment	Students explain all of the significant details of how emerging technologies may impact society and the environment.	Students explain most of the significant details of how emerging technologies may impact society and the environment.	Students explain some of the significant details of how emerging technologies may impact society and the environment.	Students explain few of the significant details of how emerging technologies may impact society and the environment.

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Grade 11-12				
Technological Design				
11-12.6.1 Select and use appropriate technologies, tools, and techniques to solve a problem (e.g., computer-assisted tools, Internet, research skills, CBL, graphing calculators)	Students select and use an extensive variety of appropriate technologies, tools, and techniques to solve a problem.	Students select and use a variety of appropriate technologies, tools, and techniques to solve a problem.	Students select and use some different appropriate technologies, tools, and techniques to solve a problem.	Students select and use very few appropriate technologies, tools, and techniques to solve a problem.
11-12.6.2 Identify examples of how new technologies advance science –	Students identify an extensive variety of examples of how new technologies have advanced science.	Students identify a variety of examples of how new technologies have advanced science.	Students identify some different examples of how new technologies have advanced science.	Students identify few examples of how new technologies have advanced science.
Technology And Society				
11-12.6.3 Explain how designing and implementing technology requires weighing trade-offs between positive and negative impacts on humans and the environment	Students provide all of the significant details that explain how designing and implementing technology requires weighing trade-offs between positive and negative impacts on humans and the environment.	Students provide most of the significant details that explain how designing and implementing technology requires weighing trade-offs between positive and negative impacts on humans and the environment.	Students provide some of the significant details that explain how designing and implementing technology requires weighing trade-offs between positive and negative impacts on humans and the environment.	Students provide few of the significant details that explain how designing and implementing technology requires weighing trade-offs between positive and negative impacts on humans and the environment.