Alignment of New Mexico Watershed Watch Activities
to
New Mexico Science Content Standards,
Benchmarks, and Performance Standards

Strand	Benchmark	Performance Standard	NMWW Activity
Strand I: Scientific Thinking and Practice	**9-12 Benchmark I:** Use accepted scientific methods to collect, analyze, and interpret data and observations and to design and conduct scientific investigations and communicate results.	1. Describe the essential components of an investigation, including appropriate methodologies, proper equipment, and safety precautions. 2. Design and conduct scientific investigations that include: • testable hypotheses • controls and variables • methods to collect, analyze, and interpret data • results that address hypotheses being investigated • predictions based on results • re-evaluation of hypotheses and additional experimentation as necessary • error analysis. 3. Use appropriate technologies to collect, analyze, and communicate scientific data (e.g., computers, calculators, balances, microscopes). 4. Convey results of investigations using scientific concepts, methodologies, and expressions, including: • scientific language and symbols • diagrams, charts, and other data displays • mathematical expressions and processes (e.g., mean, median, slope, proportionality) • clear, logical, and concise communication • reasoned arguments. 5. Understand how scientific theories are used to explain and predict natural phenomena.	***Students learn and use recognized protocols for data collection**. ***Students develop study questions and design investigations concerning watershed issues.** ***Students use meters to collect water quality data. Students analyze water samples using a colorimeter, D.O. winkler titration, TDS and pH measurements, benthic macroinvertebrate sampling and sorting, erosion control and revegetation work for habitat improvement.** ***Students present data through written papers and oral presentations.** ***Students use principles of stream hydrology to explain physical conditions of stream.**

Strand	Benchmark	Performance Standard	NMWW Activity
Strand I: Scientific Thinking and Practice	**9-12 Benchmark II:** Understand that scientific processes produce scientific knowledge that is continually evaluated, validated, revised, or rejected.	1. Understand how scientific processes produce valid, reliable results, including: * consistency of explanations with data and observations * openness to peer review full disclosure and examination of assumptions * testability of hypotheses * repeatability of experiments and reproducibility of results. 2. Use scientific reasoning and valid logic to recognize: * faulty logic * cause and effect * the difference between observation and unsubstantiated inferences and conclusions * potential bias. 3. Understand how new data and observations can result in new scientific knowledge. 4. Critically analyze an accepted explanation by reviewing current scientific knowledge. 5. Examine investigations of current interest in science (e.g., superconductivity, molecular machines, age of the universe). .	***Students present data for public review.** ***Students analyze data and discuss previously held viewpoints or beliefs.** ***Students analyze published water quality data.** ***Students interpret data in context of River Continuum Concept.** ***Students research and discuss local, state, national and international watershed issues.**

Strand	Benchmark	Performance Standard	NMWW Activity
Strand I: Scientific Thinking and Practice	**9-12 Benchmark III:** Use mathematical concepts, principles, and expressions to analyze data, develop models, understand patterns and relationships, evaluate findings, and draw conclusions.	1.Create multiple displays of data to analyze and explain the relationships in scientific investigations. 2. Use mathematical models to describe, explain, and predict natural phenomena. 3.Use technologies to quantify relationships in scientific hypotheses (e.g., calculators, computer spreadsheets and databases, graphing software, simulations, modeling). 4.Identify and apply measurement techniques and consider possible effects of measurement errors. 5.Use mathematics to express and establish scientific relationships (e.g., scientific notation, vectors, dimensional analysis).	***Students calculate streamflow and relate to environmental factors in stream.** ***Students enter data on spreadsheets and create graphs.** ***Students examine patterns and relationships between water quality parameters.** ***Students calculate summary statistics.**

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Strand II: The Content of Science Standard I (Physical Science)	**9-12 Benchmark I:** Understand the properties, underlying structure, and reactions of matter.	1.Classify matter in a variety of ways (e.g., element, compound, mixture; solid, liquid, gas; acidic, basic, neutral). 2. Identify, measure, and use a variety of physical and chemical properties (e.g., electrical conductivity, density, viscosity, chemical reactivity, pH, melting point). 3. Describe how the rate of chemical reactions depends on many factors that include temperature, concentration, and the presence of catalysts.	***Students learn concepts of conductivity and pH and relate to presence of ions or compounds in water.** ***Students conduct chemical and physical tests of stream including pH, conductivity, turbidity and temperature.** ***Students consider relationship between temperature and turbidity or temperature and dissolved oxygen.**

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Strand II: The Content of Science Standard II (Life Science)	**9-12 Benchmark I:** Understand how the survival of species depends on biodiversity and on complex interactions, including the cycling of matter and the flow of energy.	**Ecosystems** 1.Know that an ecosystem is complex and may exhibit fluctuations around a steady state or may evolve over time. 2.Describe how organisms cooperate and compete in ecosystems (e.g., producers, decomposers, herbivores, carnivores, omnivores, predator-prey, symbiosis, mutualism). 3. Understand and describe how available resources limit the amount of life an ecosystem can support (e.g., energy, water, oxygen, nutrients). 4. Critically analyze how humans modify and change ecosystems (e.g., harvesting, pollution, population growth, technology).	***Students learn River Continuum Concept and apply to local study area.** ***Students study riparian habitat and food webs.** ***Students analyze nutrient and dissolved oxygen levels in streams and learn concept of eutrophication.** ***Students study human impacts on watershed.**

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Strand II: The Content of Science Standard II (Earth Science)	**9-12 Benchmark II:** Examine the scientific theories of the origin, structure, energy, and evolution of Earth and its atmosphere, and their interconnections.	**Geochemical Cycles** 5. Know that Earth's system contains a fixed amount of natural resources that cycle among land, water, the atmosphere, and living things (e.g., carbon and nitrogen cycles, rock cycle, water cycle, ground water, aquifers).	***Students learn and apply concepts of hydrologic cycle.**

Strand	Benchmark	Performance Standard	NMWW Activity
Strand III: Science and Society Standard I: Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies.	**9-12 Benchmark I:** Examine and analyze how scientific discoveries and their applications affect the world, and explain how societies influence scientific investigations and applications.	9.Describe how scientific knowledge helps decision makers with local, national, and global challenges (e.g., Waste Isolation Pilot Project [WIPP], mining, drought, population growth, alternative energy, climate change). 12.Explain how societies can change ecosystems and how these changes can be reversible or irreversible. 13. Describe how environmental, economic, and political interests impact resource management and use in New Mexico.	***Students examine local and state policy regarding watershed issues.** ***Students examine human-induced changes in watershed and human related stream impairments.**