

MISSOURI ALIGNMENT FOR NIH SUPPLEMENT DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY		
Missouri Grade Level Expectations: Science – Grades 6 – 8		
Lesson	Standard	GLE
3, 4	3.2.G.b	Relate some common diseases (i.e., cold, influenza, strep throat, dysentery, and fungal infections) to the organisms that cause them (bacteria, viruses, protozoa, fungi). (8)
3, 4	3.2.G.c	Differentiate between infectious and noninfectious diseases. (8)
4	3.2.G.d	Explain the role of antibiotics and vaccines in the treatment and prevention of diseases. (8)
All lessons	7.1.A.a	Formulate testable questions and hypotheses.
All lessons	7.1.A.b	Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment.
All lessons	7.1.A.c	Design and conduct a valid experiment.
All lessons	7.1.A.d	Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment.
All lessons	7.1.A.e	Recognize different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models).
All lessons	7.1.A.f	Acknowledge there is no fixed procedure called “the scientific method”, but that some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and some imagination in developing hypotheses and other explanations. (7 & 8)
1, 3, 4	7.1.B.a	Make qualitative observations using the five senses.
1, 3, 4	7.1.B.b	Determine the appropriate tools and techniques to collect data.
1, 3, 4	7.1.B.c	Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, computers, spring scales, balances, magnets, metric rulers, graduated cylinders, stopwatches).
1	7.1.B.d	Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree Celsius, force (weight) to the nearest Newton, time to the nearest second.
1	7.1.B.e	Compare amounts/measurements.
1	7.1.B.f	Judge whether measurements and computation of quantities are reasonable.
1, 3, 4	7.1.C.a	Use quantitative and qualitative data as support for reasonable explanations (conclusions).
1, 3, 4	7.1.C.b	Use data as support for observed patterns and relationships, and to make predictions to be tested.
1, 3, 4	7.1.C.c	Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions).
1, 3, 4	7.1.D.a	Evaluate the reasonableness of an explanation (conclusion).

MISSOURI ALIGNMENT FOR NIH SUPPLEMENT DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

1, 3, 4	7.1.D.b	Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories).
1, 3, 4	7.1.E.a	Communicate the procedures and results of investigations and explanations through: oral presentations; drawings and maps; data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities); graphs (bar, single line, and pictograph); writings.
3	8.1.A	Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all.
3	8.2.B.b	Recognize explanations have changed over time as a result of new evidence.
2, 3, 4	8.3.B.a	Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research).

Missouri Grade Level Expectations: Mathematics – Grades 6 – 8

Lesson	Standard	GLE
3, 4	MA 1 3.3	Recognize and generate equivalent forms of fractions, decimals and percents. (6) use fractions, decimals and percents to solve problems. (7 & 8)
3, 4	MA 1 3.6	Recognize equivalent representations for the same number and generate them by decomposing and composing numbers, including scientific notation
3, 4	MA 5 1.10	Use whole number factors and multiples to describe relationships between and among numbers. (7)
3, 4	MA 1 3.4,4.1	Describe the effects of addition and subtraction on fractions and decimals (6); the effects of multiplication and division on fractions and addition and subtraction on integers (7); the effects of multiplication and division on integers (8).
3, 4	MA 5 1.6,1.10	Apply properties of operations (including order of operations) to positive rational numbers. (7)
3, 4	MA 1 1.10,3.3	Add and subtract (6); multiply and divide (7) positive rational numbers. Apply all operations on rational numbers. (8)
3, 4	MA 1 3.3,4.1	Estimate and justify the results of addition and subtraction (6); multiplication and division (7) of positive rational numbers. Estimate and justify the results of all operations on rational numbers. (8)
3, 4	MA 1 3.3	Solve problems involving proportions, such as scaling and finding equivalent ratios. (7 & 8)
3, 4	MA 4 1.6,3.6	Represent and describe patterns with tables, graphs, pictures, symbolic rules or words. (6)
1, 3, 4	MA 4 1.6	Compare (6) and contrast (7& 8) various forms of representations of patterns.
3, 4	MA 4 1.6,3.6	Model and solve problems, using multiple representations such as graphs, tables, expressions and equations (6), or inequalities. (7 & 8)
1, 3, 4	MA 2 3.1	Draw or use visual models to represent and solve problem.
1	MA 2 1.7,3.8	Analyze precision and accuracy in measurement situations. (7)

MISSOURI ALIGNMENT FOR NIH SUPPLEMENT DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

1	MA 2 1.6,1.10	Convert from one unit to another within a system of measurement.
All lessons	MA 3 1.2	Formulate questions, design studies and collect data about a characteristic.
3, 4	MA 3 1.8,3.6	Select, create and use appropriate graphical representation of data, including circle graphs, histograms and box plots (box and whiskers) (7) and scatter plots (8).
1, 3, 4	MA 3 3.6	Compare different representations of the same data and evaluate how well each representation shows important aspects of the data.
3, 4	MA 3 3.5	Use observations about differences between samples to make conjectures about the populations from which the samples were taken. (6 & 7)

Missouri Grade Level Expectations: Communication Arts – Grades 6 – 8

Lesson	Standard	GLE
All lessons	CA 2, 3 1.6	Apply decoding strategies to “problem-solve” unknown words when reading.
All lessons	CA 2, 3 1.5, 1.6	Develop vocabulary through text, using roots and affixes, context clues, glossary, dictionary and thesaurus.
All lessons	CA 2, 3 1.5 & 1.6	Apply pre-reading strategies to aid comprehension: access prior knowledge, preview, predict, set a purpose and rate for reading.
All lessons	CA 2,3 1.5 & 1.6	During reading, utilize strategies to self-question and correct, infer, visualize, predict and check using cueing systems: meaning, structure, and visual.
All lessons	CA 2, 3 1.6 & 3.5	Apply post-reading skills to comprehend and interpret text: question to clarify, reflect, analyze, draw conclusions, summarize, and paraphrase.
All lessons	CA 2, 3, 7 1.5, 1.6, 1.9	Compare, contrast, analyze (6) and evaluate (7 & 8) connections between text ideas and own experiences.
All lessons	CA 3 1.6, 1.7, 2.4, 3.5, 3.6, 3.1, 3.4	Use details from text to make predictions, make inferences, and evaluate the accuracy of the information. (6 & 7)
All lessons	CA 3 1.5, 1.6	Read and apply multi-step directions to complete a complex task.
All lessons	CA 1, 4 1.8, 2.1, 2.2	Follow a writing process to create appropriate graphic organizers to provide a structure for information, and apply writing process to write effectively in various forms and types of writing. (7)
All lessons	CA 1 1.6, 2.2	Use conventions of capitalization in written text.
All lessons	CA 1 1.6, 2.2	Use parts of speech correctly in written text.
All lessons	CA 1 1.6, 2.1, 2.2	In writing, use correct spelling of grade-level frequently-used words, classroom resources and dictionary to verify correct spelling (6), dictionary, spell-check and other resources to spell correctly. (7 & 8)
All lessons	CA 1 1.6, 2.1, 2.2	In composing text use a variety of sentence structures.
All lessons	CA 2, 3, 4 1.6, 1.8	Use a note-taking system to organize information from oral presentations and written text. (6) Use a variety of note-taking methods to organize information. (7) Select and use an appropriate method for note-taking. (8)

MISSOURI ALIGNMENT FOR NIH SUPPLEMENT DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

All lessons	CA 2, 3, 4 1.8, 2.1, 4.1	Write expository and persuasive paragraphs (including cause/ effect) and multi-paragraph essays.
All lessons	CA 5, 6 1.5, 1.6, 1.10	Listen for enjoyment, for information, for directions (6 & 7) and use clarifying strategies for understanding (e.g., questioning, summarizing and paraphrasing). (8)
All lessons	CA 5, 6 1.5	Use active-listening behaviors (e.g., asks questions of speaker and uses body language and facial expressions to indicate agreement, disagreement or confusion).
All lessons	CA 1, 6 2.1, 2.3, 4.6	In discussions and presentations, speak clearly and stay on topic, use appropriate volume, tone of voice, rate of speech, fluency/ inflections and eye contact (6); use designated time constraints, media, and organized notes (7); use appropriate body language, incorporate media or technology, and respond to questions (8).
1, 3, 4	CA 1, 6 2.1, 2.3	Give clear and concise multi-step oral directions to complete a complex task.
All lessons	CA 2, 3 1.1, 1.4, 4.5	Develop questions and statements of purpose to guide research. (6) Develop a research plan, with assistance, to guide investigation and research of focus questions. (7) Develop a research plan to guide investigation and research of focus questions. (8)
1, 3	CA 5 1.5, 1.7, 2.7	Identify and explain viewpoints conveyed in various media (e.g., videos, pictures, web-sites, artwork, plays and/or news programs). (6) Identify and explain media techniques used to convey messages in various media. (7)

Missouri Grade Level Expectations: Health Education – Grades 6 – 8 (2006 Draft Version)

Lesson	Standard	GLE
3, 4	I 2.B	Analyze cultural influences on personal health practices and decisions. (7)
4	II 1.B	Identify various health needs during adolescence (e.g., mental, emotional, social, and physical). (6)
4	II 1.B	Predict problems that may occur due to health needs, insufficient or no preventative care. (7)
3	II 2.C.c	Evaluate factors that influence food choices and their impact on nutrition and health. Factors include: culture, family, emotions, peers, and media. (7)
3, 4	II 3.B	Identify agencies that provide consumer protection. (6)
3, 4	II 3.C	Recognize how the collaboration efforts of individuals, communities, and government affect the health of a community (e.g., recycling effort, pollution centers). (6)
3, 4	II 3.C.a	Connect the appropriate resources in the community to determine their role in prevention and treatment of health related problems (e.g., American Cancer Society, March of Dimes, American Heart Association). (8)
3, 4	II 3.C.b	Examine the viewpoints and collaborative efforts of individuals, communities, and government regarding societal health issues in order to make decisions that are informed and responsible. (8)
3, 4	II 3.C.c	Analyze how the Department of Health and Human Services, the Centers for Disease Control and Prevention, and other public health agencies are responsible for disease reduction and control prevention, research, education, and enforcement of laws (e.g., food inspection, safe food storage and handling, distributing flu vaccines, and no smoking ordinances). (8)

MISSOURI ALIGNMENT FOR NIH SUPPLEMENT DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

4	II 4.B	Apply the decision making process to adolescent health issues. (6)
4	II 4.B	Analyze and evaluate how the decision making process can help an individual in life situations. (7)
All lessons	II 4.C.a	Evaluate the process used in solving problems and verify whether the solution addresses the problem to which it was applied. (7)
3, 4	II 4.C.b	Distinguish between problems that can be solved independently and those that need the help of a peer, adult, or professional.
3, 4	III 4.B.a	Recognize as a health advocate existing and potential environmental health problems within the community and create solutions to address problems (e.g., cancers of the skin and lungs, asthma, hearing loss). (8)