§112.2. Science, Kindergarten, Adopted 2021

(a) Introduction

(A) Scientific and engineering practices. Scientific inquiry is the planned and deliberate investigation of the natural world using scientific and engineering practices. Scientific methods of investigation are descriptive, correlative comparative, or experimental. The method chosen should be appropriate to the grade level and question being asked. Student learning for different types of investigations include descriptive investigations, which has no hypothesis that tentatively answers the research question and involves collecting data and recording observations without making comparisons; correlative and comparative investigations, ~~which has~~ **have** a hypothesis that predicts a relationship involve collecting data, ~~with~~ measuring variables relevant to the hypothesis that are manipulated and comparing results; and experimental investigations, which involve processes similar to comparative investigations but in which a ~~control~~ hypothesis ~~is identified~~ can be tested by comparing a treatment with a control.

(3) Scientific observations, inferences, hypotheses and theories. Students are expected to know that:

(A) observations are active acquisition of either qualitative or quantitative information from a primary source through the senses

(B) inferences are conclusions reached on the basis of observations or reasoning supported by relevant evidence

(~~A~~) (C) hypotheses are tentative and testable statements that must be capable of being supported …

(~~B~~) (D) scientific theories are based on natural and physical phenomena and are capable of being …

(b)Knowledge and skills.

(1) Scientific and engineering practices.

(A) ask scientific questions and define engineering problems based on observations ...

(B) use scientific practices to plan and conduct simple descriptive scientific ...

(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships ~~or correlations~~ ...

(5) Recurring themes and concepts.

(E) identify forms of energy and properties of matter;

1st GRADE

§112.3. Science, Grade 1, Adopted 2021.

(a) Introduction.

(A) Scientific and engineering practices. Scientific inquiry is the planned and deliberate investigation of the natural world using scientific and engineering practices. Scientific methods of investigation are descriptive, correlative, comparative, or experimental. ... investigations, which have no hypothesis that tentatively answers the research question and involves collecting data and recording observations without making comparisons; correlative and comparative investigations, ~~which~~ **have** a hypothesis that predicts a relationship involve

collecting data, ~~with~~ measuring variables relevant to the hypothesis that are manipulated and comparing results; and experimental investigations, which involve processes similar to comparative investigations but in which a ~~control~~ hypothesis ~~is identified~~ can be tested by comparing a treatment with a control....

(C) Force, motion, and energy. Students know that force and motion are related and that energy exists in many forms as a part of everyday life. ...

(3) Scientific observations, inferences, hypotheses and theories. Students are expected to know that:

(A) observations are active acquisition of either qualitative or quantitative information from a primary source through the senses

(B) inferences are conclusions reached on the basis of observations or reasoning supported by relevant evidence

(~~A~~) (C) hypotheses are tentative and testable statements that must be capable of being supported ...

(~~B~~) (D) scientific theories are based on natural and physical phenomena and are capable of being ...

(b) Knowledge and skills.

(1) Scientific and engineering practices. The student asks scientific inquiries, identifies engineering ...

(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships ~~or correlations~~ to develop ...

(5) Recurring themes and concepts. ...

(E) identify forms of energy and properties of matter;

(F) describe the relationship between structure and function of objects, organisms, and systems; and

(G) describe how factors or conditions can cause objects, organisms, and systems to either change or stay the same

§112.4. Science, Grade 2, Adopted 2021.

(a) Introduction.

(1) In Kindergarten through Grade 5 Science, ...

(A) Scientific and engineering practices. ...Scientific methods of investigation are descriptive, **correlative,** comparative, or experimental. The method chosen should be appropriate to the grade level and **research** question being asked. Student learning for different types of investigations include descriptive investigations, which **have no hypothesis that tentatively answers the research question and i**nvolve collecting data and recording observations without making comparisons; **correlative or** comparative investigations, which ~~has~~ have a hypothesis that predicts a **relationship, involve** collecting data ~~with~~, **measuring** variables **relevant to the hypothesis** that are manipulated ~~to~~ **and** ~~compare~~ **comparing** results; and experimental investigations, which involve**s** processes similar to **correlative and** comparative investigations but in which a ~~control is identified~~ **hypothesis can be tested by comparing a treatment with a control.**

...

(C) Force, motion, and energy. Students know that force and motion are related and that energy exists in many forms as a part of everyday life. ...

(3) Scientific observations, inferences, hypotheses and theories. Students are expected to know that:

(A) observations are active acquisition of either qualitative or quantitative information from a primary source through the senses

(B) inferences are conclusions reached on the basis of observations or reasoning supported by relevant evidence

(~~A~~) (C) hypotheses are tentative and testable statements that must be capable of being supported …

(~~B~~) (D) scientific theories are based on natural and physical phenomena and are capable of being …

(b) Knowledge and skills

(1) Scientific and engineering practices. The student asks science questions, identifies engineering problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The …

(A) ask science questions and define engineering problems ...

(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships ~~or correlations~~ to develop evidence-based ...

(3) Scientific and engineering practices. The student develops evidence-based scientific explanations and communicates findings, conclusions, and proposed engineering solutions. The student …

(A) develop scientific ...

§112.5. Science, Grade 3, Adopted 2021.

(a) Introduction.

(1) In Kindergarten through Grade 5 Science, content is organized into recurring strands. …

(A) Scientific and engineering practices. ... Scientific methods of investigation are descriptive, **correlative,** comparative, or experimental. The method chosen should be appropriate to the grade level and **research** question being asked. Student learning for different types of investigations include descriptive investigations, which **have no hypothesis that tentatively answers the research question and i**nvolve collecting data and recording observations without making comparisons; **correlative or** comparative investigations, which ~~has~~ have a hypothesis that predicts a **relationship, involve** collecting data ~~with~~, **measuring** variables **relevant to the hypothesis** that are manipulated ~~to~~ **and** ~~compare~~ **comparing** results; and experimental investigations, which involve**s** processes similar to **correlative and** comparative investigations but in which a ~~control is identified~~ **hypothesis can be tested by comparing a treatment with a control.**

(i) Scientific practices. Students ask questions, plan and conduct descriptive and correlational investigations ...

(C) Force, motion, and energy. Students manipulate objects by pushing and pulling to demonstrate changes in motion and position. Students also identify forces such as magnetism and gravity. Students understand energy exists in many forms, including mechanical, thermal, light, and sound. ...

(3) Scientific observations, inferences, hypotheses and theories. Students are expected to know that:

(A) observations are active acquisition of either qualitative or quantitative information from a primary source through the senses

(B) inferences are conclusions reached on the basis of observations or reasoning supported by relevant evidence

(~~A~~) (C) hypotheses are tentative and testable statements that must be capable of being supported …

(~~B~~) (D) scientific theories are based on natural and physical phenomena and are capable of being …

(b) Knowledge and skills.

(1) Scientific and engineering practices. The student asks scientific questions, identifies engineering problems, ... The student is expected to:

(A) ask scientific questions and define engineering ...

(B) use scientific practices to plan and conduct descriptive and correlational ...

(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships ~~or correlations~~ ...

(3) Scientific and engineering practices. The student develops evidence-based scientific explanations and communicates findings, conclusions, and proposed engineering solutions. The student is expected to:

(A) develop scientific explanations and propose engineering solutions supported by data and models;

...

(5) Recurring themes and concepts. …

(A) identify and use patterns to explain scientific phenomena or to design engineering solutions

(6) Matter and energy. The student knows that matter has measurable physical properties that …

(A) measure, test, and record physical properties of matter, including temperature, ~~mass~~, weight ...

(7) Force, motion, and energy. The student knows the nature of forces and the patterns …

(A) ~~demonstrate and describ~~e plan and conduct a descriptive investigation and ~~that~~ describe an object's motion when forces ~~acting~~ act on an object in contact or at a distance...

(B) plan and conduct a ~~descriptive~~ correlational investigation ~~to demonstrate and~~ to explain how position and motion can be changed by pushing and pulling objects such as swings, balls, ...

(8) Force, motion, and energy. ... The student is expected to:

(A) identify everyday ~~example~~s phenomena including light, sound, electric currents and thermal energy where energy can manifest itself by transferring energy from place to place and between objects;

(B) plan and conduct correlational investigations that ~~demonstrate~~ identify how the speed of an object is related to its mechanical energy.

112.6. Science, Grade 4, Adopted 2021.

(a) Introduction.

(1) In Kindergarten through Grade 5 Science, content is organized into recurring strands. The …

(A) Scientific and engineering practices. ... descriptive, **correlative,** comparative, or experimental. The method chosen should be appropriate to the grade level and **research** question being asked. Student learning for different types of investigations include descriptive investigations, which **have no hypothesis that tentatively answers the research question and i**nvolve collecting data and recording observations without making comparisons; **correlative or** comparative investigations, which ~~has~~ have a hypothesis that predicts a **relationship, involve** collecting data ~~with~~, **measuring** variables **relevant to the hypothesis** that are manipulated ~~to compare ,~~ **comparing** results; and experimental investigations, which involves processes similar to **correlative and** comparative investigations but in which a ~~control is identified~~ **hypothesis can be tested by comparing a treatment with a control.**

(i) Scientific practices. Students ask questions, plan and conduct descriptive and correlational ...

(B) Matter and energy. Matter and energy. Students investigate matter's measurable properties, including ~~mass~~ weight, volume, states, temperature, magnetism, and relative density...

(C) Force, motion, and energy. Students investigate forces, including friction, gravity, and magnetism, to observe their effects on objects. They differentiate between manifestations of energy including ~~mechanical,~~ sound, light, thermal, and electrical circuits ~~energy~~. Students observe the ~~cycle~~ transfer of energy and the parts of a system while exploring circuits that produce light and thermal energy. They will build on their understanding of circuits in Grade 5. As students explore thermal energy and ~~electrical~~ energy transfer, ….

(3) Scientific observations, inferences, hypotheses and theories. Students are expected to know that:

(A) observations are active acquisition of either qualitative or quantitative information from a primary source through the senses

(B) inferences are conclusions reached on the basis of observations or reasoning supported by relevant evidence

~~(A)~~ (C) hypotheses are tentative and testable statements that must be capable of being supported ...

~~(B)~~ (D) scientific theories are based on natural and physical phenomena and are capable of being …

b) Knowledge and skills.

(1) Scientific and engineering practices. The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer scientific questions, explain phenomena, or design engineering solutions using appropriate tools and models. The student is expected to:

(A) ask scientific questions and define engineering problems based on observations or information from text, phenomena, models, or investigations;

(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships ~~or correlations~~ to develop evidence-based ...

(3) Scientific and engineering practices. The student develops evidence-based scientific explanations and communicates findings, conclusions, and proposed engineering solutions. The student is expected to:

(A) develop scientific explanations and propose solutions supported by data and models;

(B) communicate explanations and engineering solutions individually and collaboratively in a variety of

(6) Matter and energy. The student knows that matter has measurable physical properties that determine how matter is identified, classified, changed, and used. The student is expected to:

(A) classify and describe matter using observable physical properties, including temperature, ~~mass~~ weight, magnetism, relative density (the ability to sink or float in water), and physical state (solid, liquid, gas);

...

(7) Force, motion, and energy. The student knows the nature of forces and the patterns of their interactions. The student is expected to plan and conduct descriptive and correlational ...

(8) Force, motion, and energy. The student knows that energy is everywhere and can be observed in cycles, patterns, and systems. The student is expected to:

...

(B) identify conductors and insulators of thermal energy and ~~electrical energy~~ electricity; and

(C) demonstrate and describe how ~~electrical energy~~ electricity travels in a closed path that can produce

...

(12) Organisms and environments. The student describes patterns, cycles, systems, and relationships within environments. The student is expected to:

(A) investigate and explain how most producers can make their own food using sunlight, water, and carbon dioxide through the cycling of matter and flow of energy.

...

§112.7. Science, Grade 5, Adopted 2021.

(a) Introduction.

(1) In Kindergarten through Grade 5 Science, content is organized into recurring strands. ...

(A)) Scientific and engineering practices. ... Scientific methods of investigation are descriptive, **correlative,** comparative, or experimental. The method chosen should be appropriate to the grade level and **research** question being asked. Student learning for different types of investigations include descriptive investigations, which **have no hypothesis that tentatively answers the research question and i**nvolve collecting data and recording observations without making comparisons; **correlative or** comparative investigations, which ~~has~~ have a hypothesis that predicts a **relationship, involve** collecting data ~~with~~, **measuring** variables **relevant to the hypothesis** that are manipulated ~~to~~ **and** ~~compare~~ **comparing** results; and experimental investigations, which involve**s** processes similar to **correlative and** comparative investigations but in which a ~~control is~~ identified **hypothesis can be tested by comparing a treatment with a control.**

(i) Scientific practices. Students ask questions, plan and conduct descriptive and correlational ...

(B) Matter and energy. Students investigate matter expanding their understanding of properties learned in Grade 4 (~~mass~~ weight, volume, states, temperature, magnetism, and relative

(B) Matter and its properties. Students build their knowledge of the natural world using their senses. The students focus on observable properties and patterns of objects, including larger and smaller, heavier and lighter, shape, color, texture, and material. The students understand changes in materials caused by heating and cooling.

(2) Nature of science. Science, as defined by the National Academy of Sciences, is the "use of

...

(b) Knowledge and skills.

(1) Scientific and engineering practices. The student asks scientific inquiries, identifies engineering problems,

(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships ~~or correlations~~ ...

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(A) develop scientific explanations and propose engineering solutions supported by data and models

...

(4) Scientific and engineering practices. The student knows the contributions of scientists ...

(5) Recurring themes and concepts. ...

(E) identify forms of energy and properties of matter;