



InterActions in Physical Science Correlation to the Iowa Core Curriculum Standards

Science As Inquiry

Benchmark	Location/Page where Standard is found
Identify and generate questions that can be answered through scientific investigations.	
Students should develop the ability to refine and refocus broad and ill-defined questions. An important aspect of this ability consists of clarifying questions and inquiries and directing them toward objects and phenomena that can be described, explained, or predicted by scientific investigations.	16-24, 91-94, 99-104, 136-140, 182-184, 194-199, 295-300, 346-350, 375-379, 450-451, 473-477
Students should develop the ability to connect their questions with scientific ideas, concepts, and quantitative relationships that guide investigations.	692-696, 12-15, 25-27, 47-52, 60-68, 105-108, 295-300
Design and conduct different kinds of scientific investigations.	
Students understand that different kinds of questions suggest different kinds of scientific investigations.	16-24, 91-94, 99-104, 136-140, 182-184, 194-199, 295-300, 346-350, 375-379, 450-451, 540-544, 473-477, 552-561
Students should develop general abilities such as making systematic observations, taking accurate measurements, and identifying and controlling variables.	12-15, 16-24, 25-27, 28-34, 91-94, 95-98, 99-104, 171-176
Students should develop the ability to clarify ideas that are influencing and guiding their inquiry, and to understand how those ideas compare with current scientific knowledge.	16-24, 91-94, 99-104, 136-140, 12-184, 194-199, 295-300, 375-379, 450-451, 552-561, 473-477
Students formulate questions, design investigations, execute investigations, interpret data, use evidence to generate explanations, propose alternative explanations, and critique explanations and procedures.	692-696, 12-15, 25-27, 47-52, 60-68, 105-108, 295-300, 16-24, 25-27, 28-34, 91-94, 95-98, 99-104, 171-176
Students use appropriate safety procedures when conducting investigations	692-696, 12-15, 25-27, 47-52, 60-68, 105-108, 295-300

Understand that different kinds of questions suggest different kinds of scientific investigations.	
Some investigations involve observing and describing objects, organisms and events; some involve collecting specimens; some involve experiments; some involve seeking more information; some involve discovery of new objects and phenomena; and some involve making models	692-696, 12-15, 25-27, 47-52, 60-68, 105-108, 295-300, 713
Select and use appropriate tools and techniques to gather, analyze and interpret data.	
The use of tools and techniques, including computers, will be guided by the questions asked and the investigations students design. Students should be able to access, gather, store, retrieve, and organize data, using computer hardware and software designed for these purposes	8-11, 12-15, 16-24, 25-27, 28-34, 42-46, 60-68, 88-90, 95-98, 109-113, 136-140, 194-199, 254-260, 295-300, 398-403, 450-451, 499-503
Incorporate mathematics in scientific inquiry.	
Mathematics is used to gather, organize and present data and to construct convincing explanations	717-720, 155-158, 274-276, 552-561, 622-625, 155-158, 194-199, 370-374
Use evidence to develop descriptions, explanations, predictions, and models.	
Students should base their explanations on observations and they should be able to differentiate between description and explanation.	691, 12-15, 25-27, 28-34, 42-46, 53-59, 114-118, 136-140, 159-165, 200, 351-353, 394, 552-561
Developing explanations establishes connections between the content of science and the contexts in which students develop new knowledge.	689-690, 683-684, 8-11, 12-15, 16-24, 25-27, 28-34, 16-24, 91-94, 99-104, 136-140, 12-184, 194-199, 295-300, 375-379, 450-451, 552-561, 473-477
Models are often used to think about processes that happen too slowly, too quickly, or on too small a scale to observe directly, or are too vast to be changed deliberately, or are potentially dangerous.	155-158, 194-199, 274-276, 370-374, 431-434, 552-561, 622-625, 155-158, 194-199, 370-374
Different models can be used to represent the same thing.	713, 692-696, 12-15, 25-27, 47-52, 60-68, 105-108, 295-300
Think critically and logically to make the relationships between evidence and explanations.	
Students decide what evidence should be used and develop the ability to account for anomalous data	16-24, 91-94, 99-104, 136-140, 182-184, 194-199, 295-300, 346-350, 375-379, 450-451, 473-477
Students should be able to review data from an experiment, summarize the data, and form a logical argument between cause and effect relationships.	12-15, 25-27, 28-34, 42-46, 53-59, 114-118, 155-158, 351-353, 394, 552-561, 657-661, 205-208, 431-434, 504-505

Students should begin to state some explanations in terms of relationships between two or more variables	12-15, 16-24, 25-27, 28-34, 91-94, 95-98, 99-104, 171-176
Recognize and analyze alternative explanations and predictions.	
Students should develop the ability to listen to and respect the explanations proposed by other students. They should remain open to and acknowledge different ideas and explanations, be able to accept the skepticism of others, and consider alternative explanations	689-690, 691, 692-696, 709-710
Communicate and defend procedures and explanations.	
Students should become competent in communicating experimental methods, describing observations and summarizing the results of investigations. Explanations can be communicated through various methods.	12-15, 16-24, 28-34, 60-68, 91-94, 95-98, 99-104, 159-165, 171-176,

Physical Science

Benchmark	Location/Page where Standard is found
Understand and apply knowledge of: <ul style="list-style-type: none"> • elements, compounds, mixtures, and solutions based on the nature of their physical and chemical properties. • physical and chemical changes and their relationship to the conservation of matter and energy. 	
A substance has characteristic properties, such as density, a boiling point, and solubility, all of which are independent of the amount of the sample. A mixture of substances often can be separated into the original substances using one or more of the characteristic properties.	506-510, 523-524
Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties. In chemical reactions, the total mass is conserved. Substances often are placed in categories or groups if they react in similar ways; metals is an example of such a group.	344-345, 346-350, 351-353, 354-357, 358, 359-360, 635-642
Chemical elements do not break down during normal laboratory reactions involving such treatments as heating, exposure to electric current, or reaction with acids. There are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for the living and nonliving substances that we encounter	511-516, 517-522, 524-528
Understand and apply knowledge of forms of energy and energy transfer.	
Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways.	134-135, 136-140, 141-147, 148-154, 188-193, 194-199, 200, 277-280, 368-369, 370-374, 375-379, 415-424

Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature.	370-374, 375-379
Light interacts with matter by transmission (including refraction), absorption, or scattering (including reflection). To see an object, light from that object- emitted by or scattered from it- must enter the eye.	410-414, 375-379
Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced	60-68, 69-74, 75-78, 53-59
In most chemical and nuclear reactions, energy is transferred into or out of a system. Heat, light, mechanical motion, or electricity might all be involved in such transfers.	473-477, 481-485, 630-634,
The sun is a major source of energy for changes on the earth's surface. The sun loses energy by emitting light. A tiny fraction of that light reaches the earth, transferring energy from the sun to the earth. The sun's energy arrives as light with a range of wavelengths, consisting of visible light, infrared, and ultraviolet radiation	425
Understand and apply knowledge of motions and forces.	
The motion of an object can be described by its position, direction of motion, and speed. That motion can be measured and represented on a graph.	159-165, 166-170, 171-176
An object that is not being subjected to a force will continue to move at a constant speed and in a straight line.	238-239, 240-243, 244-245
If more than one force acts on an object along a straight line, then the forces will reinforce or cancel one another, depending on their direction and magnitude. Unbalanced forces will cause changes in speed or direction of an object's motion	238-239-, 240-243, 244-245, 250-253, 290-294