

Ohio State Science Academic Content Standards

GRADE: 5

<i>Standard</i>	<i>Benchmark</i>	<i>Grade Level Indicator</i>
Physical Sciences	F – Describe the properties of light and sound energy.	5. Explore and summarize observations of the transmission, bending (refraction) and reflection of light.
Scientific Ways of Knowing	A – Distinguish between fact and opinion and explain how ideas and conclusions change as new knowledge is gained.	1. Summarize how conclusions and ideas change as new knowledge is gained.
	B – Describe different types of investigations and use results and data from investigations to provide evidence to support explanations and conclusions.	2. Develop descriptions, explanations and models using evidence to defend/support findings. 3. Explain why an experiment must be repeated by different people or at different times or places and yield consistent results before the results are accepted. 4. Identify how scientists use different kinds of ongoing investigations depending on the questions they are trying to answer (e.g., observations of things or events in nature, data collection and controlled experiments).
	C – Explain the importance of keeping records or observations and investigations that are accurate and understandable.	5. Keep records of investigations and observations that are understandable weeks or months later.
	D – Explain that men and women of diverse countries and cultures participate in careers in all fields of science.	6. Identify a variety of scientific and technological work that people of all ages, backgrounds and groups perform.

GRADE: 6

Scientific Inquiry	B – Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions.	3. Distinguish between observation and inference. 4. Explain that a single example can never prove that something is always correct, but sometimes a single example can disprove something.
Scientific Ways of Knowing	C – Give examples of how thinking scientifically is helpful in daily life.	3. Identify ways scientific thinking is helpful in a variety of everyday settings. 4. Describe how the pursuit of scientific knowledge is beneficial for any career and for daily life. 5. Research how men and women of all countries and cultures have contributed to the development of science.

GRADE: 7

<i>Standard</i>	<i>Benchmark</i>	<i>Grade Level Indicator</i>
Science and Technology	A – Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life.	1. Explain how the needs, attitudes and values influence the direction of technological development in various cultures. 3. Recognize that science can only answer some questions and technology can only solve some human problems.
Scientific Inquiry	B – Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions.	6. Identify faulty reasoning and statements that go beyond the evidence or misinterpret the evidence. 7. Use graphs, table and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density).
Scientific Ways of Knowing	B – Explain the importance of reproducibility and reduction of bias in scientific methods.	1. Show that reproducibility of results is essential to reduce bias in scientific investigations. 2. Describe how repetition of an experiment may reduce bias.
	C – Give examples of how thinking scientifically is helpful in daily life.	3. Describe how the works of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism and openness).

RADE: 8

<i>Standard</i>	<i>Benchmark</i>	<i>Grade Level Indicator</i>
Earth and Space Sciences	A – Describe how the positions and motions of the objects in the universe cause predictable and cyclic events.	1. Describe how objects in the solar system are in regular and predictable motions that explain such phenomena as days, years, seasons, eclipses, tides and moon cycles. 2. Explain that gravitational force is the dominant force determining the motions in the solar system and in particular the planets in orbit around the Sun. 3. Compare the orbits and composition of comets and asteroids with that of Earth. 4. Describe the effect that asteroids or meteoroids have when moving through space and sometimes planetary atmospheres (e.g., meteor-“shooting star” and meteorite).
	B – Explain that the universe is composed of vast amounts of matter, most of which is at incomprehensible distances and held together by gravitational force. Describe how the universe is studied by the use of equipment such as telescopes, probes, satellites and spacecraft.	5. Explain the universe consists of billions of galaxies that are classified by shape. 6. Explain interstellar distances are measured in light years (e.g., the nearest star beyond the Sun is 4.3 light years away). 7. Examine the life cycle of a star and predict the next likely stage of a star. 8. Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).

Physical Sciences	B – In simple cases, describe the motion of objects and conceptually describe the effects of forces on an object.	<ol style="list-style-type: none"> 1. Describe how the change in the position (motion) of an object is always judged and described in comparison to a reference point. 3. Explain that an unbalanced force acting on an object changes that object's speed and/or direction.
Science and Technology	A – Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life.	<ol style="list-style-type: none"> 1. Examine how science and technology have advanced through the contributions of many different people, cultures and times in history. 2. Examine how choices regarding the use of technology are influenced by constraints caused by various unavoidable factors (e.g., geographic location, limited resources, social, political and economic considerations).
Scientific Inquiry	B – Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions.	<ol style="list-style-type: none"> 3. Read, construct and interpret data in various forms produced by self and others in both written and oral form (e.g., tables, charts, maps, graphs, diagrams and symbols). 4. Apply appropriate math skills to interpret quantitative data (e.g., mean, median and mode).
Scientific Ways of Knowing	A – Use skills of scientific inquiry processes (e.g., hypothesis, record keeping, description and explanation).	<ol style="list-style-type: none"> 1. Identify the difference between description (e.g., observation and summary) and explanation (e.g., inference, prediction, significance and importance).
	B – Explain importance of reproducibility and reduction of bias in scientific methods.	<ol style="list-style-type: none"> 2. Explain why it is important to examine data objectively and not let bias affect observations.