



HOUSTON MUSEUM
of NATURAL SCIENCE

Texas Essential Knowledge and Skills

SCIENCE ON STAGE

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Thank you for choosing the Houston Museum of Natural Science. We are thrilled to have the opportunity to enhance your students' learning experience. To make it easier to select the right program, we have included the Texas Essential Knowledge and Skills (TEKS) for the Science on Stage programs based on grade level. This resource is designed to assist you in aligning your experience with your curriculum, ensuring that the program is both educational and enjoyable for your students.

We are excited to meet you and your students for an unforgettable journey through the wonders of discovery.

For assistance with high school TEKS, please contact curriculum@hmns.org.

Motion commotion

Goals:

- To introduce and expand on the many types of energy present and how they can be measured, used and manipulated.
- To identify when and where these types of energy are present in everyday life.
- Observe and explain waves using sound

Participants will be able to:

- Define energy
- Make inferences and predictions about what variables have effects on an outcome.
- Show the transfer of energy through various materials and means.

2nd grade

Science 1.a

Students are expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.e

Students are expected to collect observations and measurements as evidence.

Science 2.a

Students are expected to identify basic advantages and limitations of models such as their size, properties, and materials.

Science 2.d

Students are expected to evaluate a design or object using criteria to determine if it works as intended.

Science 4.a

Students are expected to explain how science or an innovation can help others.

Science 5.a

Students are expected to identify and use patterns to describe phenomena or design solutions.

Science 5.b

Students are expected to investigate and predict cause-and-effect relationships in science.

Science 5.e

Students are expected to identify forms of energy and properties of matter.

Science 5.f

Students are expected to describe the relationship between structure and function of objects, organisms, and systems.

Science 5.g

Students are expected to describe how factors or conditions can cause objects, organisms, and systems to either change or stay the same.

Science 7.a

Students are expected to explain how objects push on each other and may change shape when they touch or collide.

Science 7.b

Students are expected to plan and conduct a descriptive investigation to demonstrate how the strength of a push and pull changes an object's motion.

3rd grade

Science 1.a

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 2.a

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 3.a

The student is expected to develop explanations and propose solutions supported by data and models.

Science 4.b

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (stem) field to investigate stem careers.

Science 5.a

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.b

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 5.f

The student is expected to explain the relationship between the structure and function of objects, organisms, and systems.

Science 5.g

The student is expected to explain how factors or conditions impact stability and change in objects, organisms, and systems.

Science 7.a

The student is expected to demonstrate and describe forces acting on an object in contact or at a distance, including magnetism, gravity, and pushes and pulls.

4th grade

Science 1.a

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.e

The student is expected to collect observations and measurements as evidence.

Science 2.a

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 4.b

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (stem) field to investigate stem careers.

Science 5.a

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.b

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 5.f

The student is expected to explain the relationship between the structure and function of objects, organisms, and systems.

Science 5.g

The student is expected to explain how factors or conditions impact stability and change in objects, organisms, and systems.

Science 8.a

The student is expected to investigate and identify the transfer of energy by objects in motion, waves in water, and sound.

5th grade

Science 1.a

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.e

The student is expected to collect observations and measurements as evidence.

Science 2.a

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 2.d

The student is expected to evaluate experimental and engineering designs.

Science 4.b

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (stem) field to investigate stem careers.

Science 5.a

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.b

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 5.f

The student is expected to explain the relationship between the structure and function of objects, organisms, and systems.

Science 5.g

The student is expected to explain how factors or conditions impact stability and change in objects, organisms, and systems.

Science 7.a

The student is expected to investigate and explain how equal and unequal forces acting on an object cause patterns of motion and transfer of energy.

6th grade**Science 1.a**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 2.a

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 4.c

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (stem) field to investigate stem careers.

Science 5.b

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 5.f

The student is expected to analyze and explain the complementary relationship between the structure and function of objects, organisms, and systems.

Science 5.g

The student is expected to analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

Science 7.a

The student is expected to identify and explain how forces act on objects, including gravity, friction, magnetism, applied forces, and normal forces, using real-world applications.

Science 7.C

The student is expected to identify simultaneous force pairs that are equal in magnitude and opposite in direction that result from the interactions between objects using Newton's Third Law of Motion.

Science 8.A

The student is expected to compare and contrast gravitational, elastic, and chemical potential energies with kinetic energy.

Science 8.B

The student is expected to describe how energy is conserved through transfers and transformations in systems such as electrical circuits, food webs, amusement park rides, or photosynthesis.

7th Grade

Science 1.A

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 5.F

The student is expected to analyze and explain the complementary relationship between structure and function of objects, organisms, and systems.

Science 5.G

The student is expected to analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

Science 7.D

The student is expected to analyze the effect of balanced and unbalanced forces on the state of motion of an object using Newton's First Law of Motion.

8th Grade**Science 1.A**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and apply patterns to understand and connect scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 5.F

The student is expected to analyze and explain the complementary relationship between the structure and function of objects, organisms, and systems.

Science 5.G

The student is expected to analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

Science 7.B

The student is expected to investigate and describe how Newton's three laws of motion act simultaneously within systems such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.

Exploring Energy

Goals:

- To introduce and expand on the many types of energy present and how they can be measured, used and manipulated.
- To identify when and where these types of energy are present in everyday life.
- Observe and explain waves and the flow of energy using sound and circuits.

Participants will be able to:

- Define energy
- Make inferences and predictions about what variables have effects on an outcome.
- Show the transfer of energy through various materials and means.

2nd Grade

Science 1.A

Students are expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.E

Students are expected to collect observations and measurements as evidence.

Science 2.A

Students are expected to identify basic advantages and limitations of models such as their size, properties, and materials.

Science 5.A

Students are expected to identify and use patterns to describe phenomena or design solutions.

Science 5.B

Students are expected to investigate and predict cause-and-effect relationships in science.

Science 5.E

Students are expected to identify forms of energy and properties of matter.

Science 8.A

Students are expected to demonstrate and explain that sound is made by vibrating matter and that vibrations can be caused by a variety of means, including sound.

Science 8.B

Students are expected to explain how different levels of sound are used in everyday life such as a whisper in a classroom or a fire alarm.

3rd Grade

Science 1.A

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 2.A

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 4.B

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 8.A

The student is expected to identify everyday examples of energy, including light, sound, thermal, and mechanical.

Science 8.B

The student is expected to plan and conduct investigations that demonstrate how the speed of an object is related to its mechanical energy.

4th Grade

Science 1.A

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.E

The student is expected to collect observations and measurements as evidence.

Science 2.A

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 4.B

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 8.A

The student is expected to investigate and identify the transfer of energy by objects in motion, waves in water, and sound.

Science 8.B

The student is expected to identify conductors and insulators of thermal and electrical energy.

Science 8.C

The student is expected to demonstrate and describe how electrical energy travels in a closed path that can produce light and thermal energy.

5th Grade

Science 1.A

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.E

The student is expected to collect observations and measurements as evidence.

Science 2.A

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 4.B

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 6.A

The student is expected to compare and contrast matter based on measurable, testable, or observable physical properties, including mass, magnetism, relative density (sinking and floating using water as a reference point), physical state (solid, liquid, gas), volume, solubility in water, and the ability to conduct or insulate thermal energy and electric energy.

Science 7.A

The student is expected to investigate and explain how equal and unequal forces acting on an object cause patterns of motion and transfer of energy.

Science 8.A

The student is expected to investigate and describe the transformation of energy in systems such as energy in a flashlight battery that changes from chemical energy to electrical energy to light energy.

Science 8.B

The student is expected to demonstrate that electrical energy in complete circuits can be transformed into motion, light, sound, or thermal energy and identify the requirements for a functioning electrical circuit.

Science 8.C

The student is expected to demonstrate and explain how light travels in a straight line and can be reflected, refracted, or absorbed.

6th Grade

Science 1.A

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 2.A

The student is expected to identify advantages and limitations of models such as their size, scale, properties, and materials.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 8.B

The student is expected to describe how energy is conserved through transfers and transformations in systems such as electrical circuits, food webs, amusement park rides, or photosynthesis.

Science 8.C

The student is expected to explain how energy is transferred through transverse and longitudinal waves.

7th Grade

Science 1.A

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 8.A

The student is expected to investigate methods of thermal energy transfer into and out of systems, including conduction, convection, and radiation.

Science 8.B

The student is expected to investigate how thermal energy moves in a predictable pattern from warmer to cooler until all substances within the system reach thermal equilibrium.

Science 8.C

The student is expected to explain the relationship between temperature and the kinetic energy of the particles within a substance.

8th Grade

Science 1.A

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and apply patterns to understand and connect scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 8.A

The student is expected to compare the characteristics of amplitude, frequency, and wavelength in transverse waves, including the electromagnetic spectrum.

Cool Chemistry

Goals:

- Define a chemical, a chemical reaction, catalysts and limiting reagents.
- Define a polymer and identify their everyday occurrences and uses.
- Define mixture, solution and boiling point

Participants will be able to:

- Identify when a chemical reaction has taken place and what is needed in order to make one happen.
- Observe how different chemicals react when treated in the same way (isolating variables)
- Discuss the energy levels associated with different states of matter.

2nd Grade

Science 1.A

Students are expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.C

Students are expected to identify, describe, and demonstrate safe practices during classroom and field investigations as outlined in Texas Education Agency-approved safety standards.

Science 1.E

Students are expected to collect observations and measurements as evidence.

Science 5.A

Students are expected to identify and use patterns to describe phenomena or design solutions.

Science 5.B

Students are expected to investigate and predict cause-and-effect relationships in science.

Science 5.E

Students are expected to identify forms of energy and properties of matter.

Science 6.A

Students are expected to classify matter by observable physical properties, including texture, flexibility, and relative temperature, and identify whether a material is a solid or liquid.

3rd Grade**Science 1.A**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 3.A

The student is expected to develop explanations and propose solutions supported by data and models.

Science 4.B

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 6.A

The student is expected to measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float in water.

Science 6.B

The student is expected to describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container.

Science 6.C

The student is expected to predict, observe, and record changes in the state of matter caused by heating or cooling in a variety of substances such as ice becoming liquid water, condensation forming on the outside of a glass, or liquid water being heated to the point of becoming water vapor (gas).

Science 8.A

The student is expected to identify everyday examples of energy, including light, sound, thermal, and mechanical.

4th Grade**Science 1.A**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.C

The student is expected to demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards.

Science 10.D

The student is expected to use tools, including hand lenses; metric rulers; Celsius thermometers; calculators; laser pointers; mirrors; digital scales; balances; graduated cylinders; beakers; hot plates; meter sticks; magnets; notebooks; timing devices; sieves; materials for building circuits; materials to support observation of habitats of organisms such as terrariums, aquariums, and collecting nets; and materials to support digital data collection such as computers, tablets, and cameras, to observe, measure, test, and analyze information.

Science 1.E

The student is expected to collect observations and measurements as evidence.

Science 4.B

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 6.A

The student is expected to classify and describe matter using observable physical properties, including temperature, mass, magnetism, relative density (the ability to sink or float in water), and physical state (solid, liquid, gas).

Science 6.B

The student is expected to investigate and compare a variety of mixtures, including solutions that are composed of liquids in liquids and solids in liquids.

Science 6.C

The student is expected to demonstrate that matter is conserved when mixtures such as soil and water or oil and water are formed.

5th Grade**Science 1.A**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.C

The student is expected to demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards.

Science 1.E

The student is expected to collect observations and measurements as evidence.

Science 4.B

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and use patterns to explain scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 6.B

The student is expected to demonstrate and explain that some mixtures maintain physical properties of their substances such as iron filings and sand or sand and water.

Science 6.C

The student is expected to compare the properties of substances before and after they are combined into a solution and demonstrate that matter is conserved in solutions.

6th Grade**Science 1.A**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.C

The student is expected to use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 6.A

The student is expected to compare solids, liquids, and gases in terms of their structure, shape, volume, and kinetic energy of atoms and molecules.

Science 6.B

The student is expected to investigate the physical properties of matter to distinguish between pure substances, homogeneous mixtures (solutions), and heterogeneous mixtures.

Science 6.D

The student is expected to compare the density of substances relative to various fluids.

Science 6.E

The student is expected to identify the formation of a new substance by using the evidence of a possible chemical change, including production of a gas, change in thermal energy, production of a precipitate, and color change.

7th Grade**Science 1.A**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.C

The student is expected to use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 6.C

The student is expected to distinguish between physical and chemical changes in matter.

Science 8.C

The student is expected to explain the relationship between temperature and the kinetic energy of the particles within a substance.

8th Grade**Science 1.A**

The student is expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

Science 1.C

The student is expected to use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards.

Science 4.C

The student is expected to research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Science 5.A

The student is expected to identify and apply patterns to understand and connect scientific phenomena or to design solutions.

Science 5.B

The student is expected to identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.

Science 6.A

The student is expected to explain by modeling how matter is classified as elements, compounds, homogeneous mixtures, or heterogeneous mixtures.

Science 6.C

The student is expected to describe the properties of cohesion, adhesion, and surface tension in water and relate to observable phenomena such as the formation of droplets, transport in plants, and insects walking on water.

Science 6.D

The student is expected to compare and contrast the properties of acids and bases, including pH relative to water.

Science 6.E

The student is expected to investigate how mass is conserved in chemical reactions and relate conservation of mass to the rearrangement of atoms using chemical equations, including photosynthesis.