

Course Syllabus

Science, Grade 6

Grade 6 Science, Final
Guardian Angels School

The ITBS Form A for science measures the skills and achievement of students.

The MEAP assesses student progress in Science.

The Science performance standards are built upon the National Research Council's "National Science Education Standards" (1996) and the American Association for the Advancement of Science's Project 2061 "Benchmarks for Science Literacy" (1993).

Science is a way of making sense of the natural world. Scientists seek to describe its complexity, to explain its systems and events, and to find the patterns that allow for predictions. Science is the basis for the design of technologies that solve real world problems.

Not all students will become scientists or engineers. But science and technology occupy ever-expanding places in our everyday lives. As citizens, we are asked to make decisions about social issues that involve science and technology. As workers, we have occupations that increasingly involve science and technology. In the 21st century, adults will need to be comfortable and competent in a complex, scientific and technological world. Schools have the responsibility of preparing students for the future. Schools must prepare all students -- regardless of their future aspirations -- to be scientifically literate.

Therefore, all graduates of our schools should be:

*knowledgable about the important concepts and theories of the three major branches of scientific study: earth, life, and physical sciences;

*able to think scientifically and use scientific knowledge to make decisions about real world problems;

*able to construct new knowledge for themselves through research, reading, and discussion;

*familiar with the natural world, and respectful of its unity, diversity, and fragility;

*able to make informed judgments on statements and

debates claiming to have a scientific basis; and,

*able to reflect in an informed way on the role of science in human affairs.

To make this happen, education needs to:

1. emphasize understanding, not content coverage;
2. promote learning that is useful and relevant;
3. emphasize scientific literacy for ALL students; and,
4. promote interdisciplinary learning.

The "Michigan Content Standards and Benchmarks" describe three broad categories of activities that are common in scientifically literate individuals: using scientific knowledge; constructing new scientific knowledge, and reflecting o knowledge. The content strands are directly related to these types of activities.

The ITBS Form A for science measures the skills and achievement of students in sixth grade.

The Michigan Science Curriculum Framework provides standards and benchmarks for students in grades 6-8.

The New Standards for Science provide Performance Standards for students in grades 5-8.

The MEAP assesses student performance in science at grade eight.

Earth and Space Science

The Earth and Space Science unit addresses the composition, structure, exploration, and history of the earth and space. Topics include plate tectonics, the atmosphere, geological cycles and processes, weather, climate, the solar system, and the universe.

- The learner will be able to understand the earth's composition.
- The learner will be able to comprehend the internal and/or external structure of the Earth.

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- The learner will be able to understand the characteristics of the universe.
- The learner will be able to develop an understanding of the various changes to the earth and sky.
- The learner will be able to describe, explain, and compare the various motions of planets, moons, and comets within the solar system.
- The learner will be able to explore and explain how weather changes daily, seasonally, and over long periods of time.
- The learner will be able to describe the atmosphere's composition and properties.
- The learner will be able to find similarities between the earth and other planets and moons in terms of supporting life.
- The learner will be able to understand the earth's history.
- The learner will be able to describe how the history of the earth can be understood utilizing rocks and fossils.
- The learner will be able to compare the Earth's ability to support life with the other planets in the solar system.
- The learner will be able to describe how the features of the earth's surface alter over time.
- The learner will be able to describe how the surface of the earth is altered by technology.
- The learner will be able to explain the surface of the earth.
- The learner will be able to explain surface features using maps.
- The learner will be able to use maps to describe and identify properties of the Earth's surface.
- The learner will be able to describe how pollution in the hydrosphere began.
- The learner will be able to explain how the various forms of rock were created.
- The learner will be able to describe the break down of rocks.
- The learner will be able to explain typical observations of the night sky.
- The learner will be able to describe soil formation.
- The learner will be able to explain how the breakdown of rock and other materials forms soil, and thus changes the surface of the Earth.
- The learner will be able to understand Earth as it exists in our solar system.
- The learner will be able to find similarities among the movements of objects in the solar system.
- The learner will be able to describe present day scientific ideas about the formation of the solar system.
- The learner will be able to describe how we gain knowledge about the universe.
- The learner will be able to explain the water cycle.
- The learner will be able to describe how water behaves in the atmosphere.
- The learner will be able to describe how water exists underground.
- The learner will be able to describe how subsurface water is replenished.
- The learner will be able to explain the conditions under which the different forms of water exist.
- The learner will be able to explain how Michigan surface water arrives at the ocean and returns.
- The learner will be able to explain the way in which water moves.
- The learner will be able to explain the different forms in which water exists on the surface of the earth.
- The learner will be able to explain the conditions under which the different states of water exist.

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- The learner will be able to utilize maps of the earth to find water in its different forms.
- The learner will be able to explain what constitutes weather.
- The learner will be able to explore what constitutes weather.
- The learner will be able to describe patterns of weather changes and how those patterns are measured.
- The learner will be able to compare and contrast the earth and sun to other planets and star systems.

Research and Inquiry

The Research and Inquiry unit focuses on the knowledge, processes, and real world issues associated with science and technology. Topics include experimentation, data analysis, science related careers, and technological advances.

- The learner will be able to understand the skills required to do scientific inquiry.
- The learner will be able to understand methods of scientific inquiry.
- The learner will be able to comprehend that analysis and interpretation are components of scientific inquiry.
- The learner will be able to acquire an awareness of and sensitivity to the natural world.
- The learner will be able to analyze claims to determine their scientific merit.
- The learner will be able to evaluate the strengths and weaknesses of an argument, claim, or scientific data.
- The learner will be able to explain limits in personal knowledge.
- The learner will be able to utilize metric measurement tools to provide consistency during an exploration.
- The learner will be able to utilize suitable science equipment for an exploration.
- The learner will be able to express findings of explorations using suitable technology.
- The learner will be able to perform a scientific investigation.
- The learner will be able to plan a scientific investigation.
- The learner will be able to utilize informational sources that support scientific explorations.
- The learner will be able to demonstrate how math, science and technology apply in real world scenarios.
- The learner will be able to develop procedures in the form of step-by-step instructions, formulas, flow diagrams, and sketches.
- The learner will be able to follow procedures in the form of step-by-step instructions, formulas, flow diagrams, and sketches.
- The learner will be able to use observation skills to develop scientific questions about the world.
- The learner will be able to describe the composition of their surroundings.
- The learner will be able to learn from books and additional information sources.
- The learner will be able to demonstrate how our society is affected by science and technology.
- The learner will be able to describe how science and other ways of comprehension are related.
- The learner will be able to recognize significant contributions of individuals and groups from different cultures to science and technology.
- The learner will be able to describe how scientists decide what is considered scientific knowledge.
- The learner will be able to describe the benefits and consequences of technology.
- The learner will be able to utilize tools and technology to directly, indirectly and remotely measure and observe objects, organisms and events.

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- The learner will be able to describe or analyze an observation using information and previous knowledge.
- The learner will be able to find, recognize and utilize a large variety of relevant data to form conclusions in a research project.
- The learner will be able to recognize or control variables in an investigational and non-investigational research setting.
- The learner will be able to describe a scientific procedure or concept to other students.
- The learner will be able to communicate information and ideas individually and in a group.
- The learner will be able to communicate in a manner appropriate to the purpose and audience.
- The learner will be able to differentiate between fact and opinion.
- The learner will be able to identify sources of bias in data.
- The learner will be able to gather data with a partner or in a small group.
- The learner will be able to gather scientific data from a variety of sources.
- The learner will be able to create representations of data in a variety of forms.
- The learner will be able to use scientific evidence to reach explanations.
- The learner will be able to give evidence to defend an argument.
- The learner will be able to use scientific evidence to develop descriptions.
- The learner will be able to use scientific evidence to develop models.
- The learner will be able to analyze alternative explanations.
- The learner will be able to identify alternative explanations.
- The learner will be able to consider alternative explanations.
- The learner will be able to judge alternative explanations.
- The learner will be able to propose alternative explanations for data.
- The learner will be able to judge the accuracy, design and results of explorations.
- The learner will be able to utilize appropriate math to analyze data.
- The learner will be able to utilize appropriate math to collect data.
- The learner will be able to identify a problem.
- The learner will be able to implement a proposed solution to a problem.
- The learner will be able to suggest a solution to a problem.
- The learner will be able to pose questions to find out cause and effect.
- The learner will be able to perform controlled investigations or simulations to test hypotheses.
- The learner will be able to critique materials that have been published.
- The learner will be able to communicate results utilizing various media.
- The learner will be able to comprehend how science and technology both create useful interactions between the natural and designed worlds.
- The learner will be able to comprehend the most pertinent ideas and principles of science that affect society.
- The learner will be able to comprehend the impacts of technology.

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- The learner will be able to utilize technologies to record data.
- The learner will be able to utilize technologies to store data.
- The learner will be able to explore toys and/or simple appliances and use instructions and suitable safety precautions to explain how they work.
- The learner will be able to use various resources to solve problems.
- The learner will be able to identify the additions to science that individuals from a variety of backgrounds have contributed.
- The learner will be able to explain potential risks and benefits of introducing a new technology.