

Course Syllabus

Science, TN: Grade 8

Jefferson County Schools Curriculum, Final
Jefferson County Schools

The Terra Nova Multiple Assessments Battery for Science "measures knowledge of key concepts and facility with science process skills. By applying scientific concepts to objects and situations that are familiar to them, students draw connections between what they learn in the classroom and what they find in their own lives. Engaging graphics, photographs, and page designs typify science instructional materials and invite students to participate fully in the test.

The test covers the traditional core areas of science - inquiry, physical science, life science, Earth and space sciences - and adds science and technology, science in personal and social perspectives, and the history and nature of science, as suggested in the National Science Education Standards. Implicit in many questions is the measurement of higher-order thinking skills - the student's ability to analyze, infer, synthesize, and evaluate."

The Tennessee Science Curriculum Standards provide standards, performance indicators, and accomplishments for students in science.

The Terra Nova Multiple Assessments assess students in eighth grade (Level 18).

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Earth and Space Science

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- The learner will be able to (ESSENTIAL) comprehend the atmosphere.
- The learner will be able to (IMPORTANT) analyze various types of energy resources.
- The learner will be able to (IMPORTANT) describe how the history of the earth can be understood using fossils.
- The learner will be able to (ESSENTIAL) label a cross section of the Earth (Learning Accomplishment includes "differentiate among earth's layers according to their physical properties").
- The learner will be able to (IMPORTANT) comprehend the properties of the earth's layers and the location of major plates.
- The learner will be able to (IMPORTANT) show the major plate boundaries.
- The learner will be able to (ESSENTIAL) differentiate between the theories of continental drift and plate tectonics.
- The learner will be able to (ESSENTIAL) identify how major geologic events are caused by plate movements when provided with a scenario.
- The learner will be able to (ESSENTIAL) recognize the main plates of the earth.
- The learner will be able to (ESSENTIAL) identify the relationship between the mass of objects and the amount of gravitational attraction.
- The learner will be able to (IMPORTANT) show how the movement of plates cause geological events.
- The learner will be able to (IMPORTANT) find similarities and differences in the processes that have shaped the earth in the past and those that are shaping the earth today (e.g., plate movement, human activity, mountain building).
- The learner will be able to (IMPORTANT) explore the characteristics of minerals and their uses.

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- The learner will be able to (IMPORTANT) explain ways in which minerals are utilized.
- The learner will be able to (IMPORTANT) differentiate minerals found in rock samples with the use of test kits and/or representative charts.
- The learner will be able to (ESSENTIAL) understand natural resources.
- The learner will be able to (IMPORTANT) explain the rock cycle and label a diagram illustrating the processes of the rock cycle.
- The learner will be able to (ESSENTIAL) differentiate between sedimentary, igneous, and metamorphic rocks.
- The learner will be able to (ESSENTIAL) recognize rocks according to their physical properties.
- The learner will be able to (ESSENTIAL) recognize factors that cause the break down of rocks.
- The learner will be able to (ESSENTIAL) understand rock dynamics.
- The learner will be able to (ESSENTIAL) differentiate between renewable and non-renewable resources.
- The learner will be able to (IMPORTANT) analyze and evaluate the impact of man's use of earth's resources.
- The learner will be able to (ESSENTIAL) comprehend the solar system.
- The learner will be able to (IMPORTANT) research how technological advances have impacted the environment (e.g., the use of fertilizers, fossil fuels).
- The learner will be able to (ESSENTIAL) understand water dynamics.
- The learner will be able to (ESSENTIAL) comprehend the nature of climate.
- The learner will be able to (ESSENTIAL) understand weather.

Life Science

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- The learner will be able to (ESSENTIAL) specify biotic and abiotic factors that affect a biome.
- The learner will be able to (ESSENTIAL) identify the major biomes of the world.
- The learner will be able to (IMPORTANT) distinguish among the major biomes according to particular environmental features and identify the organisms commonly found in these areas.
- The learner will be able to (ESSENTIAL) select the correct biome for a living thing when provided with an explanation.
- The learner will be able to (IMPORTANT) investigate present information dealing with careers related to the biotechnology field.
- The learner will be able to (ESSENTIAL) understand that cells undergo chemical changes which allow energy to be converted from one form to another.
- The learner will be able to (ESSENTIAL) choose the order that describes how chromosomes move during meiosis in animal cells.
- The learner will be able to (IMPORTANT) create a model of the process of meiosis.
- The learner will be able to (ESSENTIAL) develop an understanding of cells.
- The learner will be able to (ESSENTIAL) distinguish between commensalism, parasitism, and mutualism.

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- The learner will be able to (ESSENTIAL) comprehend environments.
- The learner will be able to (ESSENTIAL) comprehend ecology.
- The learner will be able to (IMPORTANT) explore how human activities impact the land, oceans, and atmosphere.
- The learner will be able to (ESSENTIAL) recognize the activities of humans as having the ability to be beneficial or harmful to the environment.
- The learner will be able to (ESSENTIAL) assess the effect of genetic engineering on society when provided with an example.
- The learner will be able to (IMPORTANT) illustrate or build a model representing the relationship among DNA, genes, and chromosomes.
- The learner will be able to (IMPORTANT) explore the relationship among DNA, genes, chromosomes, and the genetic code.
- The learner will be able to (IMPORTANT) make a model of DNA.
- The learner will be able to (ESSENTIAL) select DNA models or illustrations that are representative.
- The learner will be able to (ESSENTIAL) predict the genotypes of offspring in a monohybrid cross from a Punnett Square.
- The learner will be able to (IMPORTANT) construct and interpret Punnett squares to discover the genotype and phenotype offspring.
- The learner will be able to (ESSENTIAL) recognize alterations in DNA sequences that may cause mutations when provided with DNA diagrams.
- The learner will be able to (IMPORTANT) study the differences between dominant and recessive traits.
- The learner will be able to (ESSENTIAL) differentiate between dominant and recessive traits.
- The learner will be able to (IMPORTANT) utilize test cross results to differentiate between dominant and recessive traits.
- The learner will be able to (ESSENTIAL) understand human health issues.
- The learner will be able to (ESSENTIAL) comprehend the life cycles of living things.
- The learner will be able to (ESSENTIAL) understand that various living things live in various habitats.
- The learner will be able to (ESSENTIAL) differentiate between complete and incomplete metamorphosis.
- The learner will be able to (ESSENTIAL) understand behavioral and/or structural adaptations.
- The learner will be able to (ESSENTIAL) determine the genus and species of an organism using a dichotomous key.
- The learner will be able to (ESSENTIAL) identify similarities and differences among organisms (Learning Accomplishment includes "similarities in their form and structure").
- The learner will be able to (ESSENTIAL) classify plants and animals into groups according to features.
- The learner will be able to (ESSENTIAL) identify the difference between sexual and asexual reproduction.
- The learner will be able to (ESSENTIAL) comprehend that organ systems work together to form living things.
- The learner will be able to (IMPORTANT) recognize characteristics on which a classification system is based.
- The learner will be able to (ESSENTIAL) deduce the relatedness of various living things using a classification system.
- The learner will be able to (ESSENTIAL) utilize a basic taxonomic key to identify an unknown living thing.

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Physical Science

The Physical Science unit includes concepts related to matter, forces, motion, and energy, as well as their interactions. Topics include chemical and physical changes, electricity, magnetism, heat, light, sound, machines, work and power.

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- The learner will be able to (IMPORTANT) comprehend the difference between acids and bases and how indicators are used.
- The learner will be able to (IMPORTANT) describe why the mass of the reactants and products is equal during a chemical change.
- The learner will be able to (IMPORTANT) identify that when oxygen combines with another substance, the result is a chemical change.
- The learner will be able to (IMPORTANT) substances will result in a physical or a chemical change.
- The learner will be able to (ESSENTIAL) establish whether a reaction is endothermic or exothermic when provided with a scenario.
- The learner will be able to (ESSENTIAL) identify that the mass of the products and reactants is equal when provided with basic chemical equations.
- The learner will be able to (ESSENTIAL) establish how the rate of a chemical reaction is affected by pH and temperature.
- The learner will be able to (ESSENTIAL) recognize the products and/or reactants in chemical reactions.
- The learner will be able to (IMPORTANT) evaluate the effectiveness of various conservation strategies on the earth's energy and natural resources.
- The learner will be able to (IMPORTANT) study aspects of society's energy consumption.
- The learner will be able to (ESSENTIAL) understand the properties of energy.
- The learner will be able to (ESSENTIAL)) explain the various sources of energy used by humans.
- The learner will be able to (IMPORTANT) understand what is expressed by a chemical equation.
- The learner will be able to (ESSENTIAL) identify the connection between the mass of objects and the force required to move them.
- The learner will be able to (ESSENTIAL) identify that forces can cause alterations in the speed or direction of motion.
- The learner will be able to (ESSENTIAL) understand and use concepts about and principles of force and motion.
- The learner will be able to (IMPORTANT) recognize factors that affect the amount of gravitational force between objects.
- The learner will be able to (IMPORTANT) explain the relationship among distance, size, mass, and gravitational force of objects.
- The learner will be able to (ESSENTIAL) match the kind of simple machine with its most proper usage.
- The learner will be able to (ESSENTIAL) identify simple machines.
- The learner will be able to (IMPORTANT) distinguish among the six types of simple machines and their uses.
- The learner will be able to (ESSENTIAL) differentiate between chemical and physical changes in matter.
- The learner will be able to (ESSENTIAL) understand the properties and structure of matter.
- The learner will be able to (IMPORTANT) recognize the uses of simple machines.

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- The learner will be able to (IMPORTANT) differentiate between mass and weight.
- The learner will be able to (ESSENTIAL) relate inertia, momentum, and action-reaction forces to Newton's three laws of motion.
- The learner will be able to (IMPORTANT) understand Newton's three laws of motion and explain how they explain the movement of objects.
- The learner will be able to (ESSENTIAL) recognize a substance as an acid or base when provided with its pH.
- The learner will be able to (ESSENTIAL) analyze and solve problems dealing with speed, velocity, time, and distance when provided with illustrations, diagrams, graphs, or scenarios.
- The learner will be able to (IMPORTANT) establish an object's speed using the distance and amount of time it traveled.
- The learner will be able to (IMPORTANT) differentiate between speed and velocity.
- The learner will be able to (ESSENTIAL) interpret scientific data.
- The learner will be able to (ESSENTIAL) understand that science and technology can cause alterations that affect society.
- The learner will be able to (ESSENTIAL) understand methods of scientific inquiry.
- The learner will be able to (ESSENTIAL) comprehend the design of an experiment.
- The learner will be able to (ESSENTIAL) understand and use the processes and skills of science and technology.
- The learner will be able to (ESSENTIAL) comprehend technological design.
- The learner will be able to (ESSENTIAL) utilize available and suitable technology.

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.

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- The learner will be able to (ESSENTIAL) recognize careers that utilize science and technology.