

**PETERS TOWNSHIP SCHOOL DISTRICT
CORE BODY OF KNOWLEDGE (CBK)
SCIENCE
GRADE 7**

For each of the sections that follow, students may be required to analyze, recall, explain, interpret, apply, or evaluate the particular concepts being taught.

COURSE DESCRIPTION

The 7th grade science curriculum offers the 21st century learner an inquiry based approach to units such as the scientific method, Earth's structure, chemistry, astronomy, cell biology and genetics and forces and motion. Through hands on learning, technology, problem based units, and synergy and collaboration with classmates, essential questions will be answered for each topic of study. Also incorporated is an interdisciplinary approach to learning through STEM that connects real world lessons to school, community, work and global awareness.

STUDY SKILLS

- Maintain an organized science binder.
- Adequately prepare for quizzes and exams through the development of study skills.

SCIENTIFIC METHOD

- List the steps of the scientific method.
- Formulate a testable hypothesis.
- Cite independent and dependent variables.
- Create and articulate valid experiments.
- Analyze data and construct graphs.
- Apply the metric system and convert between units.
- Name common laboratory equipment.

EARTH'S STRUCTURE

- Differentiate among the layers of the Earth.
- Explain the plate tectonic theory, citing measureable evidence for plate movement.
- Discriminate among the convergent, divergent, and transform plate boundaries.
- Classify rocks as sedimentary, igneous, or metamorphic.
- Outline the rock cycle and describe how it creates, destroys, and changes rocks.

CHEMISTRY

- Define the properties of matter.
- Summarize the similarities and differences among elements, compounds, and molecules.
- Construct an atom's structure and distinguish among protons, neutrons, and electrons.
- Write common element symbols.
- Predict physical and chemical properties and interactions of matter using the trends of the Periodic Table of Elements.

- Observe and identify physical and chemical changes.
- Balance chemical equations to Law of Conservation of Matter.
- Show how atoms form ionic and covalent bonds.

ASTRONOMY

- Describe repeating patterns in the Sun-Earth-Moon system and the position of stars.
- Utilize a model to demonstrate how the Earth has different seasons.
- Define gravity and inertia and conclude how they keep objects in orbital motion.
- Show how the phases of the moon are caused.
- Diagram how the moon and sun create tides on Earth.
- Combine the work of Copernicus, Brahe, Kepler, and Galileo to form the heliocentric model of the Sun-Earth-Moon system.
- Generate evidence that supports the Big Bang Theory and the age of the universe.
- Compare and contrast the size, composition, and surface features of the planets that comprise our solar system as well as the moons that orbit them.
- Illustrate the evolution of stars.

GENETICS AND HEREDITY

- List the three components of the cell theory.
- Explain the function of each cell part.
- Use a compound microscope accurately to observe plant and animal cells.
- Distinguish among the organic compounds (carbohydrates, lipids, proteins, and nucleic acids) required by all living things.
- Observe and describe the occurrence of osmosis with items placed in hypotonic and hypertonic solutions.
- Order and examine the steps of the cell cycle (interphase, mitosis, and cytokinesis).
- Value the contributions of Gregor Mendel to the foundation of genetics.
- Make Punnett squares to illustrate the possible ways alleles can combine in sample genetic crosses.
- Debate the impact of nature versus nurture in terms of inherited and acquired traits.
- Classify and build a model of the structural components of DNA.
- Provide evidence and defend examples where mutations were either beneficial, harmful, or had no effect on the organism.
- Support natural selection through citation of examples.
- Formulate an opinion of a genetic social issue (cloning, stem cell research, etc).

FORCES AND MOTION

- Produce examples where physics principles can explain everyday events and useful technology.
- Demonstrate each of Newton's three laws of motion.
- Describe force and observe how changes in motion require a force.
- Calculate and graph speed, velocity, average speed, and force using proper units.
- Calculate and graph the acceleration of a moving and falling object.
- List examples where potential and kinetic energy transform into each other.

- Build a roller coaster that incorporates Newton's three laws of motion, centripetal force, and calculates speed, acceleration, gravitational potential and kinetic energy.

MATERIALS

Pearson's Interactive workbooks: *Cells and Heredity*, *Earth' Structure*, *Introduction to Chemistry*, and *Astronomy and Space Science*

Revised September 2014