

INDIANA STATE LEARNING STANDARDS

What follows are some of the Indiana State Learning Standards which can be addressed by utilizing Time Engineers in the classroom. The subjects of Mathematics, Science and Social Studies all can be touched upon.

The codes preceding the standards read as follows: The first number refers to the grade level or class, the second to the standard, and the third to the specific skill within that standard.

MATHEMATICS

Computation

7.2.2 Calculate the percentage increase and decrease of a quantity.

Pre-Algebra

6.3.1 Write and solve one-step linear equations and inequalities in one variable and check the answers.

6.3.8 Solve problems involving linear functions with integer* values.

6.3.9 Investigate how a change in one variable relates to a change in a second variable.

7.3.2 Write and solve two-step linear equations and inequalities in one variable and check the answers.

8.3.1 Write and solve linear equations and inequalities in one variable, interpret the solution or solutions in their context, and verify the reasonableness of the results.

8.3.5 Identify and graph linear functions and identify lines with positive and negative slope.

8.3.6 Find the slope of a linear function given the equation and write the equation of a line given the slope and any point on the line.

8.3.7 Demonstrate an understanding of rate as a measure of one quantity with respect to another quantity.

Geometry

General Mathematics

6.4.2 Use the properties of complementary, supplementary, and vertical angles to solve problems involving an unknown angle.

Measurement

8.5.2 Solve simple problems involving rates and derived measurements for attributes such as velocity and density.

Data Analysis

6.6.1 Organize and display single-variable data in appropriate graphs and stem-and-leaf plots, and explain which types of graphs are appropriate for various data sets.

6.6.5 Use data to estimate the probability of future events.

7.6.2 Make predictions from statistical data.

8.6.4 Analyze, interpret, and display single- and two-variable data in appropriate bar, line, and circle graphs; stem-and-leaf plots; and box-and-whisker plots* and explain which types of display are appropriate for various data sets.

8.6.5 Represent two-variable data with a scatterplot on the coordinate plane and describe how the data points are distributed. If the pattern appears to be linear, draw a line that appears to best fit the data and write the equation of that line.

8.6.6 Understand and recognize equally likely events.

Problem Solving

6.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.

6.7.2 Make and justify mathematical conjectures based on a general description of a mathematical question or problem.

6.7.3 Decide when and how to break a problem into simpler parts.

6.7.5 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.

6.7.6 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

6.7.10 Decide whether a solution is reasonable in the context of the original situation.

6.7.11 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.

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Algebra

Linear Equations

A1.2.1 Solve linear equations.

A1.2.2 Solve equations and formulas for a specified variable.

Pairs of Linear Equations and Inequalities

A1.5.1 Use a graph to estimate the solution of a pair of linear equations in two variables.

A1.5.4 Understand and use the addition or subtraction method to solve a pair of linear equations in two variables.

A1.5.5 Understand and use multiplication with the addition or subtraction method to solve a pair of linear equations in two variables.

Mathematical Reasoning

A1.9.1 Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.

A1.9.2 Decide whether a solution is reasonable in the context of the original situation.

Algebra II

Counting Principals and Probability

A2.9.2 Use the basic counting principle, combinations, and permutations to compute probabilities.

Conic Sections

A2.4.1 Write the equations of conic sections (circle, ellipse, parabola, and hyperbola).

Integrated Mathematics

Probability

IM1.5.2 Use empirical (experimental) and theoretical probabilities.

SCIENCE

General Science

The Physical Setting

6.3.17 Recognize and describe that energy is a property of many objects and is associated with heat, light, electricity, mechanical motion, and sound.

8.3.5 Explain that everything on or anywhere near Earth is pulled toward Earth's center by a gravitational force.

Forces of Nature

7.3.20 Describe that something can be "seen" when light waves emitted or reflected by it enter the eye just as something can be "heard" when sound waves from it enter the ear.

8.3.18 Investigate and explain that electric currents and magnets can exert force on each other.

8.3.20 Compare the differences in power consumption in different electrical devices.

Matter and Energy

6.3.17 Recognize and describe that energy is a property of many objects and is associated with heat, light, electricity, mechanical motion, and sound.

Earth and Space Science

Earth

ES.1.19 Identify and discuss the effects of gravity on the waters of Earth. Include both the flow of streams and the movement of tides.

Physics I

Nature of Energy

P.1.14 Explain the relation between energy (E) and power (P). Explain the definition of the unit of power, the watt.

Electricity and Magnetism

P.1.18 Explain the concepts of electrical charge, electrical current, electrical potential, electric field, and magnetic field. Use the definitions of the coulomb, the ampere, the volt, the volt/meter, and the tesla.

P.1.21 Explain the operation of electric generators and motors in terms of Ampere's law and Faraday's law.

The Behavior of Waves

P.1.22 Describe waves in terms of their fundamental characteristics of velocity, wavelength, frequency or period, and amplitude. Know that radio waves, light, and X-rays are different wavelength bands in the spectrum of electromagnetic waves, whose speed in a vacuum is approximately $3 \cdot 10^8$ m/s (186,000 miles/second).

P.1.24 Use the concepts of reflection, refraction, polarization, transmission, and absorption to predict the motion of waves moving through space and matter.

P.1.26 Identify electromagnetic radiation as a wave phenomenon after observing refraction, reflection, and polarization of such radiation.

Principals of Integrated Chemistry – Physics

Motion

CP.1.21 Understand and explain that the change in motion of an object (acceleration) is proportional to the net force applied to the object and inversely proportional to the object's mass.

CP.1.23 Understand and explain that the motion of an object is described by its position, velocity, and acceleration.

CP.1.26 Realize and explain that all motion is relative to whatever frame of reference is chosen, for there is no absolute motionless frame from which to judge all motion.

HISTORY

General Social Studies

Historical Knowledge

7.1.1 Explain the rise of early civilizations in the river valleys of the Tigris and Euphrates in Mesopotamia and along the Nile in Northeastern Africa, including Egypt and Kush.

7.1.2 Describe the achievements of ancient Egypt in art, architecture, religion, and government and the development of the concept of theocracy

World History and Civilization

Medieval Europe and the Rise of Western Civilization: 500 to 1500

WH.5.6 Describe the technological improvements in agriculture and the growth of towns, guilds, and banking during the Middle Ages. (Economics)

An Era of Global Conflicts, Challenges, Controversies, and Changes: 1900 to the Present

WH.10.4 Trace and explain the antecedents, causes, major events, and global consequences of World War II, including the Holocaust. (Civics and Government; Individuals, Society, and Culture)