

Florida Science Correlation (Grade 9-12)

Reference: [Florida's Student Performance Science Standards \(pdf\)](#), p. 70

Introduction

This document correlates Yenka Science software to the content performance indicators of the Florida science core curriculum. It highlights specific areas of the curriculum that are covered by Yenka Science and points to resources that will be useful when teaching the material.

The terminology we have used in this document is as follows:

- **Product:** this is the relevant Yenka Science product, covering Physics and Chemistry. These products can be used independently of each other, and more information can be found on the [Yenka website](#).
- **Online activity:** these are lesson plans for classroom activities for use with the Yenka software. Students work through these independently by interacting with a Yenka simulation, following notes and answering questions to learn about an aspect of the curriculum material. Some of these lesson kits are suitable for use as a whiteboard presentation, and are referred to as *online demonstrations*.
- **Model:** a short pre-made Yenka model with instructions, which will give pupils the opportunity to apply their knowledge of a subject. These models are found under the *Content* tab when Yenka is opened.

Since all the Yenka Science titles are simulators, they will help you to cover other areas of the curriculum too. This is just a list of the activities and models that are currently available; there are plenty of other experiments you can simulate. You may wish to look at the tutorials under *Getting Started* in Yenka, and the [training videos](#) provided on the website, to explore more of the potential uses of the software, and show you how to create your own models.



STANDARD 5: Earth in Space and Time

Benchmark Code	Benchmark	Product	Content
SC.912.E.5.6	Develop logical connections through physical principles, including Kepler's and Newton's Laws about the relationships and the effects of Earth, Moon, and Sun on each other.	Yenka Motion	Online activity: - Light Rays 3 - Eclipses Online demonstration: - Orbit
SC.912.E.5.8	Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.	Yenka Light and Sound	Related models: - Electromagnetic spectrum (Waves) - Absorption of radiation (Waves) and online activity: - X-Rays in Medicine

STANDARD 8: Matter

Benchmark Code	Benchmark	Product	Content
SC.912.P.8.1	Differentiate among the four states of matter.	Yenka Inorganic Chemistry	Online activities: - States of Matter - Comparing Gases, Liquids and Solids - The Behaviour of Solids, Liquids and Gases Model (Classifying Materials): - Solids, liquids and gases
SC.912.P.8.2	Differentiate between physical and chemical properties and physical and chemical changes of matter.	Yenka Inorganic Chemistry	Online activities: - Some Physical and Chemical Changes - Looking at Chemical Changes

SC.912.P.8.5	Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.	Yenka Inorganic Chemistry	Online activities: - Periodicity in Group 1 - Periodic Table (2)
SC.912.P.8.7	Interpret formula representations of molecules and compounds in terms of composition and structure.	Yenka Inorganic Chemistry	Online activities: - Chemical Formulae and Equations - Electron Arrangements and the Formulae of Compounds - Empirical Formula Model (Equations and Amounts): - Empirical formula of metal oxide
SC.912.P.8.8	Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions.	Yenka Inorganic Chemistry	Related online activities: - Redox - Displacement Reactions and Redox - Neutralisation (1) - Displacement Reactions
SC.912.P.8.9	Apply the mole concept and the law of conservation of mass to calculate quantities of chemicals participating in reactions.	Yenka Inorganic Chemistry	Online activities: - The Mole - Sulfate Analysis Model (Equations and Amounts): - Moles and masses See also: - Excess - Excess Reactant - Back Titration
SC.912.P.8.10	Describe oxidation-reduction reactions in living and non-living systems.	Yenka Inorganic Chemistry	Online activity: - Redox See also: - Displacement Reactions and Redox - Thermal Decomposition and Redox - Reduction of Metal Oxides - Using Displacement Reactions to Produce Metal Coatings 2

SC.912.P.8.11	Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.	Yenka Inorganic Chemistry	Online activity: - pH and pOH Model (Acids, Bases and Salts): - Acids and bases
SC.912.P.8.12	Describe the properties of the carbon atom that make the diversity of carbon compounds possible.	Yenka Inorganic Chemistry	Related online activity: - Using Carbon to Reduce Metals

STANDARD 10: Energy

Benchmark Code	Benchmark	Product	Content
SC.912.P.10.1	Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.	Yenka Electricity Yenka Motion Yenka Inorganic Chemistry Yenka Motion	Model (Electrical Energy): - Transforming Energy See also the online activities: - Kinetic Energy Formula - Work Done Against Gravity - Power Transmission - Investigating Energy Changes in Reactions and demonstration: - Playground Scenes
SC.912.P.10.2	Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.	Yenka Motion Yenka Electricity	Related online demonstration: - Newton Cradle - Elastic and Inelastic Collisions - Projectile – Horizontal and Vertical Velocity - Mass and Gravitational Acceleration and model (Electrical Energy): - Transforming energy

SC.912.P.10.3	Compare and contrast work and power qualitatively and quantitatively.	Yenka Motion Yenka Electricity Yenka Motion	Related online activities: - Work Done Against Gravity - Power, Current and Voltage and model (Energy and Motion): - Work done
SC.912.P.10.4	Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter.	Yenka Inorganic Chemistry	Online activity: - Heating Curves See also the model (Classifying Materials): - Melting ice and boiling water
SC.912.P.10.6	Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.	Yenka Inorganic Chemistry Yenka Motion	Online activity: - Energy Changes in Reactions (1) Model (Energy and Motion): - Elastic potential energy
SC.912.P.10.7	Distinguish between endothermic and exothermic chemical processes.	Yenka Inorganic Chemistry	Online activity: - Energy Changes in Reactions (2) Online demonstration: - Endothermic Reactions - Exothermic Reactions Model (Energy): - Endothermic and exothermic See also: - Investigating Energy Changes in Reactions - Reaction
SC.912.P.10.15	Investigate and explain the relationships among current, voltage, resistance, and power.	Yenka Electricity	Online activities: - Ohm's Law - Power, Current and Voltage

			<p>Model (Circuits):</p> <ul style="list-style-type: none"> - Ohm's Law <p>See also:</p> <ul style="list-style-type: none"> - Changing Current - Light Bulb Resistance - Resistance and Current in a Bulb - Know your V, I, R stuff? <p>and the demonstration:</p> <ul style="list-style-type: none"> - Resistor Power Dissipation
SC.912.P.10.16	Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.	Yenka Electricity	<p>Related online activities:</p> <ul style="list-style-type: none"> - Transformers - Power Transmission <p>and demonstration:</p> <ul style="list-style-type: none"> - Power Transmission Lines
SC.912.P.10.18	Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.	Yenka Light and Sound	<p>Models (Waves):</p> <ul style="list-style-type: none"> - Electromagnetic Spectrum - Ultrasound <p>Online activities:</p> <ul style="list-style-type: none"> - X-rays in Medicine - Refraction and Colour <p>Online demonstration:</p> <ul style="list-style-type: none"> - Pure Colour
SC.912.P.10.20	Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.	Yenka Light and Sound	<p>Online activities:</p> <ul style="list-style-type: none"> - Frequency and Period - Wave Speed - Wave Refraction 1 - Wave Refraction 2 <p>See also:</p> <ul style="list-style-type: none"> - Transverse Waves - Longitudinal Waves

SC.912.P.10.21	Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.	Yenka Light and Sound	Model (Waves): - Doppler Shift
SC.912.P.10.22	Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.	Yenka Light and Sound	Online activities: - Ray Diagrams - Forming an Image See also: - Correcting Vision - Convex and Concave Lenses and models (Optics): - Convex and concave mirrors - Lenses - Mirrors and reflection

STANDARD 12: Motion

Benchmark Code	Benchmark	Product	Content
SC.912.P.12.1	Distinguish between scalar and vector quantities and assess which should be used to describe an event.	Yenka Motion	Related online activity: - Speed or Velocity
SC.912.P.12.2	Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.	Yenka Motion	Models (Describing Motion): - Acceleration - Distance-time graphs - Velocity-time graphs See also online activities: - Graphs Showing Speed at Different Times - V-T Graphs and Distance 1 - V-T Graphs and Distance 2 - V-T Graphs and Distance 3

			and demonstration: - Bouncing Ball
SC.912.P.12.3	Interpret and apply Newton's three laws of motion.	Yenka Motion	Online activities: - M and A for Fixed Force - F and A for Fixed Mass - F = ma – Finding Force - F = ma – Finding Mass - F = ma – Acceleration - F = ma – The Full Set Models (Force and Acceleration): - Newton's first law - Newton's second law - Newton's third law See also: - Force and Acceleration - Newton Cradle
SC.912.P.12.4	Describe how the gravitational force between two objects depends on their masses and the distance between them.	Yenka Motion	Online activity - Mass and Gravitational Acceleration
SC.912.P.12.5	Apply the law of conservation of linear momentum to interactions, such as collisions between objects.	Yenka Motion	Model (Energy and Motion): - Conservation of momentum Online demonstration: - Newton Cradle
SC.912.P.12.11	Describe phase transitions in terms of kinetic molecular theory.	Yenka Inorganic Chemistry	Related activities: - States of Matter - The Behaviour of Solids, Liquids and Gases
SC.912.P.12.12	Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.	Yenka Inorganic Chemistry	Online activities: - Concentration and Rate of Reaction - Catalyst - Catalysts - Effect of Particle Size on Reaction Rate

			<ul style="list-style-type: none"> - Reaction Rates – Calcium Carbonate and Acid - Calcium Carbonate Reaction Rate Change - Effect of Surface Area on Reaction Rate (2) - Effect of Concentration on Reaction Rate (1) - Effect of Concentration of Reaction Rate (2) - Effect on Rate of Reaction of Varying Surface Area (1) <p>Models (Reaction Rates):</p> <ul style="list-style-type: none"> - Catalysts and rate - Concentration and rate - Surface area and rate - Temperature and rate
SC.912.P.12.13	Explain the concept of dynamic equilibrium in terms of reversible processes occurring at the same rates.	Yenka Inorganic Chemistry	<p>Model (Equations and Amounts):</p> <ul style="list-style-type: none"> - Equilibrium (ammonium chloride)

If you have any questions about Yenka or this document, please contact [Esther Droop](#) or visit www.yenka.com