Course Outline for:

Integrated Science (online)

Grade Levels: 8th grade

Assignments: 36 lessons **Credits:** 10 units

UC a-g Requirements: none (meets graduation requirement)

Instructional Materials: online

Course Description

Integrated Science takes students on a tour of scientific thought and exploration. Students learn about such varied subjects as rainbows, weather, astronomy and space exploration. They investigate polar issues and the ozone depletion problem. They take a brief look at the science of sports and study the brain, the nervous system. Then they move along to Life and Physical Science topics, studying the science of geysers, glaciers, whales, hummingbirds and plants and animals in general. Students learn about electricity, magnetism and other energy systems. Students will visit colorful online websites and magazines. They have an opportunity to design their own research projects and experiments in order to pursue their own interests at the end of the course.

Learning Objectives

- Highlight the causal reasoning and consistent empiricism that hard science depends upon
- Show the connection between human perception and interpretation with the philosophy, processes, and goals of science
- Students recognize the unified framework, method, and application of science in any given area of use or study.
- Understand the common principles and methods that define a particular science as a field of study
- Introduce students to the variety of science applications
- Explore some of the endless curiosities which propel scientific thought and explanation
- Encourage appreciation for the scope and value of various areas of scientific research
- Become familiar with some current events and possible sources for obtaining science news

- Focus on the exciting and progressive nature of scientific endeavor
- Integrate young people`s natural curiosity with the pursuit of scientific theories and the experimentation which helps construct them

Course Outline

Lesson 1: The Exploratorium

A) Explore museum web site - response questions
B) Site links - response questions

Lesson 2: *Yes Mag*

A) Explore *Yes Mag* web site - response questions

Lesson 3: Rainbows

A) *What do you know about rainbows?*: questions
B) Explore web sites about rainbows - questions
C) Creative project

Lesson 4: Weather (Part 1)

A) Research 2 weather topics - questions

Lesson 5: Weather (Part 2)

A) Write 2 paragraphs on topics (above)

Lesson 6: Weather (Part 3)

A) Explore *Weather Station* web site - links - questions

Lesson 7: Mars

A) Explore *Mars!* web site - questions

Lesson 8: Astronomy

A) View *Picture of the Day* - response questions
B) *NASA Mars Exploration Page* gallery - response questions
C) Mars Polar Lander - reading questions
D) Mars Global Surveyor - reading questions
E) More images from the surface of Mars - response questions

Lesson 9: Polar Regions

A) Research stations - writing response
B) Australian Antarctic Division site - links - questions
C) Antarctic ice fields - reading questions
D) Ozone hole - writing response
E) Imaginative writing assignment

Lesson 10: Penguins & Polar Bears

A) Penguins - reading questions
B) Polar Bears - reading questions
C) Extra credit assignment

Lesson 11: Sports

A) Explore sports site
B) Noel Wanner article on baseball - reading questions
C) Baseball article - reading questions
D) Article on balls - reading questions
E) Article on rock climbing - reading questions
F) Article on Sports Podiatry - reading questions

Lesson 12: The Brain

A) Explore UW *Neuroscience for Kids* site: overview of nervous system - divisions & subdivisions - functions, etc - questions
B) Project: construct a model of the brain & its parts
C) Choose new topic from site - read all related information - answer questions & present your reading

Lesson 13: The Nervous System

A) Return to UW site: the spine & its segments - reflexes - reading questions
B) Choose experiment or activity to perform
C) Writing assignment: explain learning & experiment (above)

Lesson 14: The Electric Car

A) Overview of the electric car - reading questions
B) List 3 disadvantages of electric cars
C) Writing assignment: alternative transportation

Lesson 15: Butterflies

A) Read about butterflies - reading questions
B) Monarchs - migration - reading questions
C) Extra credit assignment

Lesson 16: Choose Your Own Topic

A) Choose 4 Life Science topics - questions
B) Do 1 of 2 given projects/activities

Lesson 17: Choose Your Own Topic (Part 2)

A) Choose 4 Physical Science topics - questions
B) Do project/activity

Lesson 18: Choose Your Own Topic (Part 3)

A) Choose 4 Earth Science topics - questions
B) Do project/activity

Lesson 19: Geysers

A) Explore 3 locations where geysers are found - questions
B) Research 2 or 3 more geysers - write summaries of sites

Lesson 20: Glaciers

A) Glaciers in Western Canada - questions
B) Formation of glaciers - crevasses - questions
C) Movement and functions of glaciers - drumlins - questions

Lesson 21: Whales

A) Explore sites about whales - questions

Lesson 22: A Trip to the Zoo

A) Explore Santa Ana Zoo site
B) Writing assignment: choose 4 animals - describe each & answer questions
C) Endangered species: investigate 2 animals - questions
D) Research an animal of your choice - questions
E) Extra credit assignment

Lesson 23: Hummingbirds

A) Overview - questions
B) Informational topics - write summaries of 5 topics
C) Write summaries of 2 areas of hummingbird site

Lesson 24: Animals

A) Endangered species site
B) Write on 3 endangered species - questions
C) Write more on 1 endangered species
D) Write summaries of 5 more animals
E) Choose a topic & write a journalistic report

Lesson 25: World of Plants

A) Missouri Botanical Garden - questions
B) New York Botanical Garden - questions - 3 plant summaries
C) Berry Botanic Garden - alien plants - questions
D) Lower plants - questions

Lesson 26: Astronomy

A) Observing the sky: stars - nebulae - galaxies - questions
B) The Milky Way - types of galaxies - questions
C) Explore Physics/Astronomy site - write about your discoveries

Lesson 27: El Niño

A) Overview - questions
B) Effects & impact of El Niño

C) Research a site about El Niño of your choice - write paragraph on site

Lesson 28: Electricity

A) Explore site: overview of electricity - reading questions
B) Lightening - questions
C) Terminology - definitions
D) Lightening & safety - writing assignment

Lesson 29: Magnetism & Telephones

A) Magnetism - questions
B) Create your own force field - questions
C) Telephones - summary of learning
D) Alexander Graham Bell - summary of Bell
E) Fiber optics: history - questions

Lesson 30: Dinosaurs

A) Explore site about dinosaurs - summary of general anatomy & behavior
B) Investigate 5 types of dinosaurs - summary of each dinosaur
C) Dinosaur quiz - questions

Lesson 31: Flying

A) Airplane cockpits - instruments - questions
B) Training to become a pilot - questions

Lesson 32: Energy

A) Potential & kinetic energy - questions
B) Thermodynamics - forms of energy - questions
C) Energy sources - writing assignment
D) Summary of 2 more topics

Lesson 33: More Electricity

A) Currents - volts - static electricity - questions
B) Write summary on topic of choice
C) Perform project/experiment - write detail of project

Lesson 34: Common Questions in Science

A) Choose topics - Create questions for each

Lesson 35: Weekly Science News

A) Read 2 current science articles - summarize
B) Repeat above with 3 more articles - questions
C) Write a faux science article

Lesson 36: What Interests You Most?

A) Survey questions
B) Research topic - summarize

C) Survey