

**CTY SYLLABUS
BE A SCIENTIST!**

WHEN	WHAT	HOW	ASSESS
DAY 1 WHAT IS SCIENCE?	Introduction CTY Honor Code Expectations Lab rules Pre- Assess Team Building Different branches of Science	Family Crest (get to know students) What is a Scientist? Group brainstorm & dress up game (lab coat etc) Introduce different branches of science & as a group depict a scientist doing that work (body murals) Lab Safety – Brainstorm rules & create safety posters	HW: Due Day 5 Create dictionary that defines given list of 50 common branches of science. Include cover page, and photos that demonstrate 15 of those branches
HOW DO SCIENTISTS THINK?	Key Concepts Observations Quantitative/ Qualitative 5 senses, Classify, Predict Infer Make models	Lab / Lecture Classify – use plastic bags filled with various items students will use to classify Word Wall – use to define key terms Five Senses Activity – get students to use all five senses Outdoor Observations – go to an area and ask students to use senses to observe Lab – Predict how many drops of water a penny will hold.	HW: Due Day 2 Laboratory Report on Penny Lab
DAY 2 SCIENTIFIC INQUIRY SCIENTIFIC METHOD	Steps of Scientific Method Observation, Hypothesis, Experiment, Record Results, & Draw Conclusions	Review Steps of Scientific Method Design Visual Aids to Present Scientific Method Demo: Observe two eggs / one floating Which falls faster? Group design an experiment – Swirling Milk Lab : Flip a penny on which side will it land the most	HW: Due Day 3 BCR: How I use the scientific method at home?
WHAT ARE THE TOOLS OF A SCIENTIST?	Scientific Equipment Standard Units of Measure Volume, Mass, Length	Lecture: Common scientific equipment Activity: Scientific equipment scavenger hunt Activity: Cut out feet to measure length of room Lecture to identify why & what standard units of measure Lab: Go for the Gold! Practice measuring volume, length, mass Lecture to identify parts and proper use of microscope Lab to practice using the microscope	
DAY 3 BE A BIOLOGIST!	Living / Non living organisms Cells Photosynthesis/ Respiration	Lecture: What is biology? How do biologists characterize living things? Difference between bacteria, plant, and animal cell. Class activity: Edible cells Lab activity : DNA extraction lab	HW: Due Day 4 Design an experiment
BE A BOTANIST!	Characteristics of plants Different types of plants	Lab to plant seeds and observe growth over next two weeks. Lecture: characteristics of plants, types of plants, parts of a plant, flowers & fruit Lab: How plants carry water (AIMS) Pigment chromatography Flower dissection	

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DAY 4 BE A ZOOLOGIST	Characteristics of Animals Different types of animals Adaptations How the structure of an organism relates to its function	Lecture: What is animal? Demonstration of different types of animals. Class discussion on adaptations. Lab activity on adaptations Video on Adaptation: Eat or be Eaten	HW: Due Day 5 Laboratory Report on Adaptation Lab
	Explore how animals react to stimuli Explore the most diverse order of animals	Data collection for plant lab Lab activity: Warming up to Worms Lab activity: Classroom insect collection	
DAY 5 BE A GENETIST!	Explore how traits are Inherited (DNA & genes)	Lecture: DNA & genes Create DNA Model Lab: Human Genetics Class activity: Design a baby by flipping coins	
BE A PHYSIOLOGIST!	Basic Body System Concept of homeostasis	Lecture Class Activity: Matching body systems with functions Laboratory Activity: Blood Pressure & Heart Rate Class Activity: Body Systems (design a diet & exercise plan for a fictional client)	HW: Due Day 6 Laboratory write up on how heart rate is affected by exercise (based on lab)
DAY 6 BE A METEOROLOGIST!	Basic principles of weather Types of clouds How rain is formed Severe weather	Lecture: Basic Concepts of Weather Weather Watch: Observe clouds for the week Lab activity: Make it rain inside Lab activity: Tiny Tornado Guest Speaker from Local TV Station?	HW: Due Day 7 Develop an emergency plan with your family & make a list of things needed in an emergency kit
BE A CHEMIST!	Atoms & Matter States of matter Classify elements Chemical Reactions	Classroom Activity: Atoms Family Lab: Matter (cornstarch) Periodic Table Activity Lab: Pretzel Chemistry Lab: Bubble Fun	
DAY 7 BE A CHEMIST!	Review Atoms & Matter Metals Fireworks	History of Fireworks Demonstration: Flame Test Ice Cream in a Bag	HW: Due Day 8 Describe fireworks that you see tonight & what metals you believe were used to create them.
DAY 8 BE A FORENSIC SCIENTIST!	Review principles of DNA Unique fingerprints	Review properties of DNA Class activity: Fantastic Fingerprints Lab Activity: Analyze Splatter Patterns Lab Activity: Foot to Height Analysis Lab Activity: Teeth Impressions Class Case Study http://www.cyberbee.com/whodunnit/crimescene.html	HW: Due Day 14 Star Count Reports
	How forensic scientists use science to solve crimes?	Murder Mystery – Interactive Crime Solving Group Write your own murder mystery	
DAY 9 BE AN ECOLOGIST!	Soil Types Trees Camouflage Food Chains	Lecture: Basic terms of ecology Class Activity: Tricky Butterfly Lab Activity: Camouflage Potato Class Activity: Popcorn Chain Lab Activity: Dissect owl pellets	HW: Due Day 10 Lab Write-up on Owl Pellet (Reconstruct Food Web)
	Ecosystems	Lab Activity Who Lives There Field activity to identify surrounding ecosystems Species Identification Group Activity: Biome Travel Agency Project	

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DAY 10 JULY 7, 2006 BE A MARINE BIOLOGIST!	Characteristics of Marine Ecosystems & Biomes Classification of Marine Organisms Ocean Currents	Lab Activity: Properties of Salt & Fresh H ₂ O Lecture: Animals of the Ocean – Fact sheets http://www.geocities.com/sseagraves/fishyfacts.htm Lab Demonstration: Mountain in the Sea Classroom Activity: Education on the Halfshell	
	Estuaries- Chesapeake Bay Mangroves	Lecture on Characteristics of the Bay Lab Experiment: Comparing Density of Freshwater & Saltwater Class Activity: Chesapeake Bay Jeopardy Lab Activity: Build your own Mangrove	HW: Due Day 11 Develop plan with family on how you can help the Bay.
DAY 11 JULY 10, 2006 BE A GEOLOGIST!	Rock Types Geological Formations	Lecture: Basic Land formations & geology terms Class Activity: Secrets of Sand Lab Activity: Build a Volcano	
	Erosion Crystals	Lab Activity: Get eroded Boulder to Bits Lab Activity: Create your own Crystals Lab Activity: Make rock candy	
DAY 12 JULY 12, 2006 BE A PHYSICIST!	Light: Bending & Prisms Forces Sound	Lecture: Basic concepts in physics Lab Activity: Bounce the Light Lab Activity: Color Mixer Lab Activity: See Sound	
	Pendulum Gravity Friction	Lab Activity: Get into the Swing Lab Activity: What a Downer Lab Activity: Friction Action Lab Activity: Make a sinker float	HW: Due Day 14 Idea for how to build a container for egg drop
DAY 13 JULY 11, 2006 BE AN ENGINEER!	Structures Simple Machines Engines	Lecture: Review concepts from physics Link to engineering Lab Activity: Gum Drop Bridge Lab Activity: Egg Drop Challenge Lab Activity: The Great Balloon Race	
	Principles of Rockets	Lab Activity: Build Water Rockets Class Activity: Falling, Flying, Gliding	HW: Due Day 13 Summary of History of rockets
DAY 14 JULY 13, 2006 BE AN ASTRONOMER!	Planets Stars Orbits Asteroids	Lecture: Introduce Topic Lab Activity: Discover the Planets Lab Activity: Space Rocks & Craters Lab Activity: Shine On! Present Star Count Reports	
PRESENT SCIENTIFIC INFORMATION	Characteristics of Scientific presentations	Students present one Scientist Complete Plant experiment Graph data	Complete Lab write-up on Plant experiment
DAY 15 JULY 14, 2006 BE AN ARCHAEOLOGIST!	Archaeology Summary & Wrap up Challenge	Lab Activity: Artifact Detective Group Activity: Students are given hypothetical problems and must present what scientist & how the scientist would solve the problems Prepare for parent presentations	
PRESENT THEIR RESEARCH	Aspects of scientific presentation	Each students presents on of the scientist that they learned about this summer!	Apply the scientific method to summer fun