Port Discover
Northeastern North Carolina's Center for Hands-on Science

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Education Programs

Science Fair 101

Availability: All Year **Target Audience:** 3rd - 5th

Description: Science Fair 101 introduces students to the Scientific Method. Students will work through the scientific method by conducting a science experiment as the class. Introduction to different graphing techniques will be explored, as well as practicing mathematics and reading comprehension during this program. This program will guide students to a successful science fair project.

Science Fair 201

Availability: All Year **Target Audience:** 5th - 8th

Description: Science Fair 201 will support and expand on the materials taught in 101. Students will be challenged to advance graphing and mathematical skills. This program will focus on observational and organizational skills to complete the experiment. This program will prepare students for independent science fair project.

State Standards Met:

- 3rd -5th Grade
  - **Science as Inquiry**
    - Students must actively participate in science investigations, and use the cognitive and manipulative skills necessary for formation of scientific explanations. They examine the validity of an explanation based on evidence rather than speculation. Through experiments and investigations students conduct, shape, and modify their knowledge of science concepts and processes. Students at this level should be able to formulate questions, design and carry out investigations, interpret and use data to generate explanations, and critique explanations and procedures. Such investigations should lead students to conduct their own further investigations.

National Standards Met:

- K-4
  - **UNDERSTANDINGS ABOUT SCIENTIFIC INQUIRY**
    - Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world.
    - Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects, events, and organisms; classifying them; and doing a fair test (experimenting).
    - Simple instruments, such as magnifiers, thermometers, and rulers, provide more information than scientists obtain using only their senses.
    - Scientists develop explanations using observations (evidence) and what they already know about the world (scientific knowledge). Good explanations are based on evidence from investigations.
    - Scientists make the results of their investigations public; they describe the investigations in ways that enable others to repeat the investigations.
    - Scientists review and ask questions about the results of other scientists' work.
- 5-8
  - **UNDERSTANDINGS ABOUT SCIENTIFIC INQUIRY**
    - Different kinds of questions suggest different kinds of scientific investigations. Some investigations involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve seeking more information; some involve discovery of new objects and phenomena; and some involve making models.
    - Current scientific knowledge and understanding guide scientific investigations. Different scientific domains employ different methods, core theories, and standards to advance scientific knowledge and understanding.
    - Mathematics is important in all aspects of scientific inquiry.

- Technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations.
- Scientific explanations emphasize evidence, have logically consistent arguments, and use scientific principles, models, and theories. The scientific community accepts and uses such explanations until displaced by better scientific ones. When such displacement occurs, science advances.
- Science advances through legitimate skepticism. Asking questions and querying other scientists' explanations is part of scientific inquiry. Scientists evaluate the explanations proposed by other scientists by examining evidence, comparing evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence, and suggesting alternative explanations for the same observations.
- Scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures for an investigation, or develop new technologies to improve the collection of data. All of these results can lead to new investigations.

Amazing Metamorphosis

Availability: April-October **Target Audience:** K – 4th

Description: Join us as we journey through the life cycle of Metamorphosis. The adventure will be fun-filled and interactive as we explore what it takes to become a beautiful butterfly and other cool insects. During butterfly season the class will be able to observe live butterflies along their cycles. Weather permitting students will have a chance to release adult live butterflies back to nature.

State Standards Met:

- Kindergarten
  - 1.05 Observe the similarities of humans to other animals including:
    - Basic needs
    - Growth and change
- 1st Grade
  - 1.02 Investigate the needs of a variety of different animals:
    - Air
    - Water
    - Food
    - Shelter
    - Space
  - 1.04 Identify local environments that support the needs of common North Carolina plants and animals.
  - 1.05 Discuss the wide variety of living things on Earth.
- 2nd Grade
  - Describe the life cycle of animals including
    - Developing Into and Adult
    - Reproducing
  - 1.03 Observe the different stages of an insect's life cycle
  - 1.04 Compare and contrast life cycles of other animals such as mealworms, ladybugs, crickets, guppies or frogs
- 4th Grade
  - 1.03 Observe and discuss how behaviors and body structures help animals survive in a particular habitat.
- 5th Grade
  - 1.05 Determine the interaction of organisms within an ecosystem.
  - 1.06 Explain and evaluate some ways that humans affect ecosystems.
    - Habitat reduction due to development
    - Pollutants
    - Increased nutrients

National Standards Met:

- K-4 Students
  - Abilities necessary to do scientific inquiry
  - Understanding about scientific inquiry
  - Simple instruments, such as magnifiers, thermometers, and rulers, provide more information than scientists obtain using only their senses.
- Life Science
  - The characteristics of organisms
  - Life cycles of organisms

- Organisms and environments

- 5-8 Students
  - Structure and function in living systems
  - Reproduction and heredity
  - Regulation and behavior
  - Populations and ecosystems
  - Diversity and adaptations of organisms

1+1=Achoo

Availability: All Year **Target Audience:** 3st – 8th grade

Description: 1+1=Achoo is an interactive hands-on program that allows students to observe how germs are spread within a population. Through inquiry science students will analyze different ways to prevent infectious epidemics. The class will learn the proper way to wash hands by taking Port Discover's Hand Washing Challenge.

State Standards Met:

- 4th Grade
  - 1.01 Observe and describe how all living and nonliving things affect the life of a particular animal including:
    - Other animals.
    - Plants.
    - Weather.
    - Climate.
  - 1.02 Observe and record how animals of the same kind differ in some of their characteristics and discuss possible advantages and disadvantages of this variation.
  - 1.03 Observe and discuss how behaviors and body structures help animals survive in a particular habitat.
  - 1.04 Explain and discuss how humans and other animals can adapt their behavior to live in changing habitats.
  - 1.05 Recognize that humans can understand themselves better by learning about other animals.
- 5th Grade
  - Describe and compare several common ecosystems (communities of organisms and their interaction with the environment).

National Standards Met:

- K-4 Students
  - Life Science
    - The characteristics of organisms
    - Life cycles of organisms
    - Organisms and environments
  - Science in Personal and Social Perspectives
    - Personal health
    - Characteristics and changes in populations
    - Types of resources
    - Changes in environments
    - Science and technology in local challenges
- **5-8 Students**
  - Science in Personal and Social Perspective
    - Personal health
    - Populations, resources, and environments
    - Natural hazards
    - Risks and benefits
    - Science and technology in society

Pump It Up

Availability: All Year **Target Audience:** K - 8th grade

Description: This program takes the classroom on an adventure through the circulatory system by closely examining a real heart. Students learn the importance of daily exercise, nutrition and health care. Students will certainly be 'Pumped Up' about heart health after this exciting program. Hands-on activity varies depending on grade level of audience.

State Standards Met:

- Kindergarten
  - 1.05 Observe the similarities of humans to other animals including:
    - Basic needs
    - Growth and change
    - Movement
- 1st Grade
  - 1.02 Investigate the needs of a variety of different animals
    - Water
    - Food
  - 1.03 Observe the ways in which humans are similar to other organisms
- 3rd Grade
  - 4.05 Observe and describe how muscles cause the body to move
- 4th Grade
  - 4.01 Explain why organisms require energy to live and grow
  - 4.02 Show how calories can be used to compare the chemical energy of different foods
  - 4.03 Discuss how foods provide both energy and nutrients for living organisms
  - 4.04 Identify starches and sugars as carbohydrates
  - 4.05 Determine that foods are made up of a variety of components

National Standards Met:

- K-4 Students
  - Personal Health
    - Individuals have some responsibility for their own health. Students should engage in personal care—dental hygiene, cleanliness, and exercise—that will maintain and improve health. Understandings include how communicable diseases, such as colds, are transmitted and some of the body's defense mechanisms that prevent or overcome illness.
    - Nutrition is essential to health. Students should understand how the body uses food and how various foods contribute to health. Recommendations for good nutrition include eating a variety of foods, eating less sugar, and eating less fat.
- 5-8 Students
  - Life Science
    - The human organism has systems for digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection
  - Science in Personal and Social Perspectives
    - Personal health
    - Characteristics and changes in populations
    - Types of resources
    - Changes in environments
    - Science and technology in local challenges

- Personal Health
  - Regular exercise is important to the maintenance and improvement of health. The benefits of physical fitness include maintaining healthy weight, having energy and strength for routine activities, good muscle tone, bone strength, strong heart/lung systems, and improved mental health. Personal exercise, especially developing cardiovascular endurance, is the foundation of physical fitness.
  - Food provides energy and nutrients for growth and development. Nutrition requirements vary with body weight, age, sex, activity, and body functioning.

Seed Me Grow

Availability: All Year **Target Audience:** K-5th

Description: Exploring the life of a seed and learn how seeds are dispersed. This program includes a seed dissection and much more! Students will test their knowledge of dispersal by designing a seed for a seed dispersal challenge.

State Standards Met:

- 1st Grade
  - 1.01 Investigate the needs of a variety of different plants:
- 3rd Grade
  - 1.03 Investigate and describe how plants pass through distinct stages in their life cycle including.
    - Growth.
    - Survival.
    - Reproduction.
  - 1.04 Explain why the number of seeds a plant produces depends on variables such as light, water, nutrients, and pollination.
  - 1.05 Observe and discuss how bees pollinate flowers.
  - 1.06 Observe, describe and record properties of germinating seeds.

National Standards Met:

- K-4 Students
  - Life Cycles Of Organisms
    - Plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying. The details of this life cycle are different for different organisms.
- 5-8 Students
  - Reproduction And Heredity
    - Reproduction is a characteristic of all living systems; because no individual organism lives forever, reproduction is essential to the continuation of every species.

CSI Discovery

Availability: All Year **Target Audience:** K – 5th

Description: CSI-Discovery Port Discover style teaches students to observe, investigate and conduct science experiments to solve a mystery. Lab tools used to blood typing, along with fingerprinting techniques will be part of this interactive program. Join Port Discover to uncover your identity!

State Standards Met

- 1st Grade
  - 1.03 Observe the ways in which humans are similar to other organisms.
  - 3.05 Observe mixtures including:
  - Solids with solids.
  - Liquids with liquids.
  - Solids with liquids.
- 2nd Grade
  - 3.01 Identify three states of matter:
    - Solid.
    - Liquid.
    - Gas.

National Content Standards

- K-4 Students
  - Science as Inquiry
    - Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world.
    - Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects, events, and organisms; classifying them; and doing a fair test (experimenting).
    - Simple instruments, such as magnifiers, thermometers, and rulers, provide more information than scientists obtain using only their senses.
    - Scientists develop explanations using observations (evidence) and what they already know about the world (scientific knowledge). Good explanations are based on evidence from investigations.
    - Scientists make the results of their investigations public; they describe the investigations in ways that enable others to repeat the investigations.
    - Scientists review and ask questions about the results of other scientists' work.
  - Science and Technology
    - Abilities of technological design
    - Understanding about science and technology
    - Abilities to distinguish between natural objects and objects made by humans
  - Science in Personal and Social Perspectives
    - Personal health
    - Characteristics and changes in populations
    - Types of resources
    - Changes in environments
    - Science and technology in local challenges
  - Personal Health
    - Individuals have some responsibility for their own health. Students should engage in personal care—dental hygiene, cleanliness, and exercise—that will maintain and improve health. Understandings include how communicable diseases, such as colds, are transmitted and some of the body's defense mechanisms that prevent or overcome illness.
- 5-8 Students
  - Life Science

        - All organisms are composed of cells—the fundamental unit of life. Most organisms are single cells; other organisms, including humans, are multicellular.
        - Every organism requires a set of instructions for specifying its traits. Heredity is the passage of these instructions from one generation to another.
        - Hereditary information is contained in genes, located in the chromosomes of each cell. Each gene carries a single unit of information. An inherited trait of an individual can be determined by one or by many genes, and a single gene can influence more than one trait. A human cell contains many thousands of different genes.
    - Science and Technology
        - Abilities of technological design
        - Understandings about science and technology
    - Science in Personal and Social Perspectives
        - Personal health
        - Risks and benefits
        - Science and technology in society
    - History and Nature of Science
        - Science as a human endeavor
        - Nature of science
        - History of science

Blast Off **Target Audience:** 3rd – 7th

Availability: March-October

Description: Children are mesmerized as the world of physics comes alive right before their eyes. In this program, the children get to design, build, and launch their very own rocket high into the sky. After all the excitement is over they will get to take their rockets and a better understanding of physics home with them.

State Standards Met:

- Kindergarten:
    - 2.04 Observe and determine the effects of weather on human activities.
- 1st Grade
    - 4.01 Discuss the wide variety of living things on Earth.
    - 4.02 Observe that movement of an object can be affected by pushing or pulling.
    - 4.03 Investigate and observe that objects can move steadily or change direction
- 2nd grade:
    - 2.01 Investigate and describe how moving air interacts with objects
    - 2.02 Observe the force of air pressure pushing on objects
- 5th grade:
    - 4.01 Determine the motion of an object by following and measuring its position over time.
    - 4.02 Evaluate how pushing or pulling forces can change the position and motion of an object.
    - 4.03 Explain how energy is needed to make machines move.
    - 4.04 Determine that an unbalanced force is needed to move an object or change its direction.
    - 4.05 Determine factors that affect motion including:
        - Force
        -

National Standards Met:

- K-4 Students
    - Physical Science

        - An object's motion can be described by tracing and measuring its position over time.
        - The position and motion of objects can be changed by pushing or pulling. The size of the change is related to the strength of the push or pull.
- 5-8 Students
    - Physical Science
        - The motion of an object can be described by its position, direction of motion, and speed. That motion can be measured and represented on a graph.
        - If more than one force acts on an object along a straight line, then the forces will reinforce or cancel one another, depending on their direction and magnitude. Unbalanced forces will cause changes in the speed or direction of an object's motion.
        - Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways

Plankton Watch I – Water Quality

Availability: All Year **Target Audience:** 1st - 5th Grade

Description: Plankton Watch I gives students an overview of ecosystems, water quality, scientific design and data collection. Students will be left with the challenge to design and create their own water monitoring tools such as a secchi disc, water sampler, anemometer and more. They will also be challenged to use these tools to study local water sources over a period of time, across a transect or between comparative locations as well as to create hypotheses, gather data and form conclusions related to the variable(s) that they choose to study.

State Standards Met:

- Kindergarten
    - 2.05 Use common tools to measure weather.
- 1st Grade
    - 1.04 Identify local environments that support the needs of common North Carolina plants and animals.
- 2nd Grade
    - 2.04 Identify and use common tools to measure weather:
        - Wind vane and anemometer.
        - Thermometer.
        - Rain gauge.
    - 2.06 Observe and record weather changes over time and relate to time of day and time of year.
- 3rd Grade
    - 1.02 Observe and describe how environmental conditions determine how well plants survive and grow in a particular environment.
- 5th Grade
    - 1.01 Describe and compare several common ecosystems (communities of organisms and their interaction with the environment).
    - 1.03 Explain why an ecosystem can support a variety of organisms.
    - 1.06 Explain and evaluate some ways that humans affect ecosystems.
        - Pollutants.
        - Increased nutrients.

National Standards Met:

- K-4 Students

- Science as Inquiry
    - Ask A Question About Objects, Organisms, And Events In The Environment. This aspect of the standard emphasizes students asking questions that they can answer with scientific knowledge, combined with their own observations. Students should answer their questions by seeking information from reliable sources of scientific information and from their own observations and investigations.
    - Employ Simple Equipment And Tools To Gather Data And Extend The Senses. In early years, students develop simple skills, such as how to observe, measure, cut, connect, switch, turn on and off, pour, hold, tie, and hook. Beginning with simple instruments, students can use rulers to measure the length, height, and depth of objects and materials; thermometers to measure temperature; watches to measure time; beam balances and spring scales to measure weight and force; magnifiers to observe objects and organisms; and microscopes to observe the finer details of plants, animals, rocks, and other materials. Children also develop skills in the use of computers and calculators for conducting investigations.
- Organisms And Their Environments
    - All organisms cause changes in the environment where they live. Some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.
    - Humans depend on their natural and constructed environments. Humans change environments in ways that can be either beneficial or detrimental for themselves and other organisms.
- Changes In Environments
    - Environments are the space, conditions, and factors that affect an individual's and a population's ability to survive and their quality of life.
    - Changes in environments can be natural or influenced by humans. Some changes are good, some are bad, and some are neither good nor bad. Pollution is a change in the environment that can influence the health, survival, or activities of organisms, including humans.
    - Some environmental changes occur slowly, and others occur rapidly. Students should understand the different consequences of changing environments in small increments over long periods as compared with changing environments in large increments over short periods.

- 5-8 Students
    - Populations And Ecosystems
        - A population consists of all individuals of a species that occur together at a given place and time. All populations living together and the physical factors with which they interact compose an ecosystem.
        - For ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis. That energy then passes from organism to organism in food webs.
        - The number of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. Given adequate biotic and abiotic resources and no disease or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem.

Critter Feeders

Availability: December - February **Target Audience:** K – 5th

Description: An ecosystem can be an exciting place for a child to explore their environment. This program comes to life with Port Discover's live critters that represent each member along the food chain. The class will make their own critter feeder to take home to observe critters that may live in their neighborhoods.

State Standards Met:

- Kindergarten
  - 1.05 Observe the similarities of humans to other animals including:
    - Basic needs.
- 1st Grade
  - 1.02 Investigate the needs of a variety of different animals:

National Standards Met:

- K-4 Students
  - Life Science
    - Organisms have basic needs. For example, animals need air, water, and food; plants require air, water, nutrients, and light. Organisms can survive only in environments in which their needs can be met. The world has many different environments, and distinct environments support the life of different types of organisms.
    - The behavior of individual organisms is influenced by internal cues (such as hunger) and by external cues (such as a change in the environment). Humans and other organisms have senses that help them detect internal and external cues.
    - An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.

Hue Knew:

Availability: All Year **Target Audience:** Pre-K - 1st

Description: Children are fascinated by the wonderful world of colors and the amazing fact that they can be made from our three primary colors. In this program, children are given primary colors and then through experimentation create secondary colors. Come explore the rainbow in Port Discover Science Lab!

State Standards Met

- Kindergarten
  - 3.02 Develop and use a vocabulary associated with the properties of materials:
    - Color.
- 1st Grade
  - 3.05 Observe mixtures including:
    - Solids with solids.
    - Liquids with liquids.
    - Solids with liquids

National Standards Met

- K-5 Students
  - Science of Inquiry
    - Abilities necessary to do scientific inquiry

- Understanding about scientific inquiry

Cool Chemistry

Availability: All Year **Target Audience:** K – 5th

Description: Cool Chemistry makes learning chemistry fun! This class is full of slimy, gooey and icky experiments that students test to discover different properties and chemical reactions that are created in our Science Lab.

State Goals Met:

- 1st grade
  - 3.01 Describe the differences in the properties of solids and liquids.
  - 3.02 Investigate several ways in which objects can be described, sorted or classified.
  - 3.05 Observe mixtures including:
    - Solids with solids.
    - Liquids with liquids.
    - Solids with liquids.
- 2nd Grade
  - 3.01 Identify three states of matter:
    - Solid.
    - Liquid.
    - Gas.
  - 3.04 Show that solids, liquids and gases can be characterized by their properties.
  - 3.05 Investigate and observe how mixtures can be made by combining solids, liquids or gases and how they can be separated again.
- 4th Grade
  - Preparation for the chemistry concepts related to goal 2.02 Recognize that minerals have a definite chemical composition and structure, resulting in specific physical properties including:

National Content Standards Met:

- K-4 Students
  - Physical Science
    - Materials can exist in different states—solid, liquid, and gas.
    - Objects have many observable properties, including size, weight, shape, color, temperature, and the ability to react with other substances.
    - Objects are made of one or more materials
- 5-8 Students
  - Physical Science
    - Properties and changes of properties in matter
    - A mixture of substances often can be separated into the original substances using one or more of the characteristic properties.
    - Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties.
    -

Reduce, Reuse, Recycle

Availability: All Year **Target Audience:** K-5th grade

Description: Students learn about the importance of the three Rs: Reuse, Reduce and Recycle, as they participate in a "playlet" that analyzes the energy and steps needed to produce one piece of paper. Papermaking with recycled newspaper is featured.

State Standards Met:

- 1st Grade
  - 2.05 Explore where useful earth materials are found and how they are used.
- 3rd Grade
  - 2.05 Determine how composting can be used to recycle discarded plant and animal material.
- 5th Grade
  - 1.06 Explain and evaluate some ways that humans affect ecosystems.
    - Habitat reduction due to development.
    - Pollutants.

National Standards Met:

- K-4 Students
  - Life Science
    - All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants.
    - An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment. When the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.
    - All organisms cause changes in the environment where they live. Some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.
    - Humans depend on their natural and constructed environments. Humans change environments in ways that can be either beneficial or detrimental for themselves and other organisms.

Snowflakes Everywhere:

Availability: December-February **Target Audience:** K – 5th

Description: Join us on an adventure to explore the microscopic world of snowflakes. What are some common shapes? How do snowflakes form? Why are there no two alike? These are a few of the topics we will explore during our journey. Students create their own snowflakes.

State Standards Met:

- Kindergarten:
  - 2.02 Identify different weather features including:
  - 2.03 Identify types of precipitation
  - 3.02 Develop and use a vocabulary associated with the properties of materials:
- 1st Grade
  - 3.05 Observe mixtures including:
    - Solids with solids.
    - Liquids with liquids.
    - Solids with liquids.
- 2nd Grade
  - 2.03 Describe weather using quantitative measures of:
    - Temperature.
    - Wind direction.
    - Wind speed.
    - Precipitation.

- 5th Grade
  - 3.02 Discuss and determine how the following are affected by predictable patterns of weather:
    - Temperature.
    - Wind direction and speed.
    - Precipitation.
    - Cloud cover.
    - Air pressure.

National Standards Met:

- K-4 Students
  - Changes In The Earth And Sky
    - Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.

All programs meet various competencies outlined by the North Carolina Science Curriculum. Small fees are charged for programs. Port Discover Science Outreach Program is made possible thanks to the support of the Elizabeth City Foundation.

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