



Discovery Place, Inc. Science Club Workshops (6th grade and higher)

These workshops are designed to give a more intense experience in each of the topic areas. They are taught at a higher level to ensure that participants receive as thorough of an experience as possible during the allotted time of 6 weeks (12 contact hours).

General Information

- ✓ The information will be presented in a fun and interactive way using demonstrations and hands-on activities. The demonstrations and activities are designed to reinforce the concepts presented.
- ✓ Each participant will be given a general syllabus that will offer a brief synopsis of the workshop, including expectations of the content over the course of the session. This will give some idea of the structure of the workshop.
- ✓ Where applicable, there will be a pre-assessment administered at the beginning of the session or at the beginning of the individual classes, respectively. This information will be used to give the presenter an idea of where the participants are as a group, therefore we can teach the information most appropriate to their knowledge level. Respectively, there will be post-assessment given at the end of the session or at the end of the individual classes that will be used to determine how effectively the information is being received and retained.
- ✓ When appropriate, homework will be given to help with specific application and/or to build a better understanding of the information presented in class. All participants are expected to complete these assignments to the best of their ability.

Recommended Tips for Success (Please share with the participants)

- ✓ Each student needs to come to class prepared with writing instruments and a notebook, dedicated to the Discovery Place, Inc. workshops. A notebook is preferable over loose-leaf papers because it allows all of the information to be stored in one place. It is helpful if the notebook has pockets to keep handouts and other loose material. The student will have the responsibility of taking notes in class and studying those notes in between class meetings.

Discovery Place, Inc. Science Club Workshops – Course Listing (6th grade and higher)

Recommendation for workshop selection – Plan the courses for the entire year at the beginning of the year. This will allow you to arrange it so that appropriate prerequisites can be offered prior to the workshops requiring prerequisites. For example, if you want to take Comparative Anatomy (with dissections), you will need to set up the schedule so that there is time to offer the Human Body Systems (with dissections) workshop before the Comparative Anatomy workshop can be offered.

Workshops are 6 weekly meetings – 2 hours per meeting. Session schedule is as follows (exceptions may be made if discussed in advance, i.e. summer sessions):

- ◆ October – November
- ◆ January – February
- ◆ April – May

Courses are listed with the prerequisite requirement. Prerequisites are required for each student enrolled in the workshop. This ensures that each participant enters the class with the knowledge level required to successfully complete the coursework.

Level 1 Class Listings – no prerequisites required

- ◆ Human Body Systems (with dissections)
- ◆ Plant and Animal Biology Basics
- ◆ Ecology – Everything is Connected (Environmental Science)
- ◆ Geology
- ◆ Space Science – All Aboard and Off to Space (formerly Space Science I)
- ◆ Space Science – What’s Out There?
- ◆ Robotics Basics
- ◆ Physics – Keep It Moving
- ◆ Physics – Let’s Make Waves
- ◆ Chemistry Concoctions I
- ◆ Astronomy

Level 2 Class Listings – prerequisites required

- ◆ Comparative Anatomy (with dissections)
 - Prerequisite – Human Body Systems (with dissections)
- ◆ Plant Biology (offered only in the spring)
 - Prerequisite – Plant and Animal Biology Basics
- ◆ Animal Biology (offered only in the spring)
 - Prerequisite – Plant and Animal Biology Basics
- ◆ Fun with Robots I
 - Prerequisite – Robotics Basics
- ◆ HAM Radio
 - Prerequisite – Robotics Basics
- ◆ Chemistry Concoctions II
 - Prerequisite – Chemistry Concoctions I

Level 3 Class Listings – prerequisites required

- ◆ Fun with Robots II
 - Prerequisite – Fun with Robots I

Discovery Place, Inc. Science Club Workshops – Course Descriptions

**(6th grade and higher)
(2003-2004)**

*Descriptions are written to give a general understanding of the workshop and the concepts that are involved.
The coursework for each workshop will be taught at the specific grade level of the class.*

Human Body Systems (with dissections)

Explore the anatomy and physiology of the human body via the individual body systems. Participants will learn about the body systems, the major organs and functions of the systems, how to keep the organs healthy, the repercussions of not maintaining a healthy body and how the body systems work interdependently to help us function as we do. The study of the systems will be coupled with dissections of organs in select systems, which will also provide the basic foundation to proper dissection skills. The class format is a fun and interactive approach with lots of hands-on activities and demonstrations to help reinforce the concepts presented. Each participant will receive a dissection kit that will be his or hers to keep.

Comparative Anatomy (with dissections) – Prerequisite Human Body Systems

This workshop is a great follow-up to the Human Body Systems. Once the participants have an in-depth understanding of the systems in the human body and how the organs work, the information may easily be compared and contrasted to other animals that inhabit our earth. Through dissection and demonstrations, the participants will learn the anatomy and physiology of a variety of invertebrates and vertebrates. With this knowledge, participants will gain an understanding of how the differences and similarities between animals help them survive in our world (adaptation).

Plant and Animal Biology Basics

In this workshop we will study the building blocks of living things – the cells. Through hands-on activities and demonstrations the participants will develop a better understanding of various concepts including genetics, equilibrium and other cellular phenomena. We will also learn lab techniques used to explore the functions of the cell and cellular interactions. There will be a specific focus on plant and animal cells and how these cells combine to form the extensive variety of plants and animals that exist on our planet today.

Plant Biology (offered only in Spring) – Prerequisite Plant and Animal Biology Basics

There are various types of plants and they serve a variety of purposes. To better understand and appreciate the value of plants in our lives, we will explore how plants develop, function and fit into our world. Through hands-on interactions with museum collections and natural resources we will observe, analyze, compare and contrast representatives of the Plant Kingdom. Some sessions may be held in an outside location to provide a more effective study of the principles and concepts.

Animal Biology (offered only in Spring) – Prerequisite Plant and Animal Biology Basics

This exciting workshop will explore some of the members of Animal Kingdom and how these animals function, interact and fit into our world. We will participate in many activities that will assist in understanding these co-inhabitants better. Participants will take a journey through the Animal Kingdom with opportunities to encounter live animals up close and personal. Some sessions will be held in an outside location to provide a more effective study of the principles and concepts.

Ecology – Everything is Connected (Environmental Science)

Participants will delve into the interesting field of Ecology while gaining an understanding of how human actions impact our world. The main goal of this workshop is to discover how living things (including people) interact with each other and their environment. Food chains, stream ecology, nature cycles and more will be studied through hands-on investigations. By understanding the principles of Ecology, participants can develop a better appreciation and respect for the environment that we are a part of.

Discovery Place, Inc. Science Club Workshops (page 2)

*Descriptions are written to give a general understanding of the workshop and the concepts that are involved.
The coursework for each workshop will be taught at the specific grade level of the class.*

Geology

This field of science involves the study rocks and minerals, the processes that form rocks, minerals and landscapes as well as the study of the history of the earth and our solar system. In this workshop we will explore the basics of Geology with a specific focus on elements, minerals, rocks, as well as the practical uses and applications in our daily lives. This workshop includes a visit to Discovery Place, Inc. to observe the museum's geological collection as well as a walking tour of uptown Charlotte, which will highlight some of the geologic connections used in the construction of buildings.

Space Science – All Aboard and Off to Space (formerly named Space Science I)

What forces keep us on our planet? How do we overcome those forces to explore outer space? This workshop will take a journey through the history of space flight and provide an opportunity to assimilate how the astronaut lives and works in space. Face the challenge of designing, building and launching different space vehicles. It will be a blast!

Space Science – What's Out There?

What's out there? Beyond our planet there is an entire system that is very exciting to discover. From the safety of Spaceship Earth, we will travel to the rings of Saturn, the storm on Jupiter, the icy surface of Pluto and more. Join us in this workshop where we will explore the depths of space and what is happening out there. This workshop incorporates a hands-on approach that will ensure participants experience an awesome space adventure.

Robotics Basics (Electronics)

Explore the basic concepts involved in understanding how robots operate. A lot of the concepts are based on physics principles, such as electricity and magnetism, simple machines, etc. Participants will gain a better understanding of simple machines and how they are used in building more complex machines like robots. Electronics also play a major role in understanding the basics of Robotics. Join us as we explore this fun and innovative topic through hands-on interactions.

Fun with Robots I – Prerequisite Robotics Basics

Become a robotics specialist, as you work with an array of different robots. Robots are motorized construction systems based on the principles of engineering and basic physics. Participants will use their imagination, interlocking interchangeable parts and motors to build, power and control robots. From the turning of a gear to executing a more complex set of task, these robots are at your command. Assemble and test our robots of different types, styles, and abilities and even build a little robot that will be yours to keep!

Fun with Robots II – Prerequisite Fun with Robots I

Now that you have the basics under your belt, we will delve deeper into the engineering involved in constructing a robot. We will build a robot, from scratch, that will be yours to keep. We will assemble the PC board with transistors, resistors, etc., understanding the important role that each piece plays in the overall operation of the robot. Soldering will be introduced and used in constructing the robot. This workshop ensures lots of fun!

HAM Radio – Prerequisite Robotics Basics

Come to Discovery Place, Inc. for this fun and exciting workshop in our very own HAM Radio room. Receive first hand experience of the inside workings of this fascinating profession in a five-week adventure. You will learn about the technology used in Amateur Radio Communications and build a 4-band short wave receiver that is yours to keep. This workshop is a great first step towards a Novice Radio Operators License.

Discovery Place, Inc. Science Club Workshops (page 3)

*Descriptions are written to give a general understanding of the workshop and the concepts that are involved.
The coursework for each workshop will be taught at the specific grade level of the class.*

Physics – Keep It Moving

Have you ever ridden a roller coaster and felt like your stomach was doing flips or felt like you were being lifted out of your seat as you traveled down a steep hill? This concept can be explained by understanding Isaac Newton's laws of motion, which are the basis for most physics phenomena. Join us in this fun workshop as we use hands-on explorations and experiences to learn more about energy (kinetic, potential, mechanical), forces (acceleration, velocity, gravity, buoyancy) and motion (center of mass, inertia).

Physics – Let's Make Waves

Why do airplanes leave the ground but cars never do? How is music stored on a compact disc? What allows a microwave oven to cook food? Find out the answer to these questions and more in this interactive and fun workshop. Through hands-on investigations, we will explore the principles of light (refraction, reflection, diffraction), sound (frequency, amplitude) and pressure (air, vapor, fluid). So... come prepared to make 'waves'.

Chemistry Concoctions I

Chemistry is all around us! This workshop will provide the opportunity to explore the exciting world of chemistry as we investigate chemical and physical changes, polymers, testing of acids and bases using various indicators and pH test and taking a closer look at matter and its phases. If you enjoy hands-on experiments and are curious about the exploration of chemicals and how they interact with each other, this is the workshop for you.

Chemistry Concoctions II – Prerequisite Chemistry Concoctions I

If you enjoy Chemistry Concoctions I then you will love Chemistry Concoctions II. This workshop will further explore and provide applications for the concepts learned in Chemistry Concoctions I. In addition, we will delve into other concepts such as cryogenics and chemiluminescence. If you enjoy hands-on experiments and are curious about the exploration of chemicals and how they interact with each other, this is the workshop for you.

Astronomy

What do you see when you look into the sky? Come with us on a tour as we take an inventory of the universe. Participants will learn more about the history and science of Astronomy, tools of the astronomer and how to properly use them and translating information from a star map to the sky. Most of our exciting exploration will take place in Starlab – our portable planetarium. (Special location required – Gymnasium or Multipurpose room with appropriate floor space – Inquire for specifics).