موهبة
Mawhiba

Mawhiba Academic Enrichment Program

Introduction To the Enrichment Units

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Mawhiba Academic Enrichment Program

Mawhiba academic enrichment program is one of the most important global methods used to enrich the knowledge of gifted students. This program includes a scientific enrichment content representing 75% and a skill content representing 25% of the total weight of the program. From this standpoint, Mawhiba designed a variety of enrichment units to enrich and deepen students' knowledge and experiences and challenging their abilities in a number of scientific fields within four main tracks: engineering sciences, medical, biological and chemical sciences, physics, earth and space sciences, and computer sciences and applied mathematics in cooperation with the best international expert houses in the field of Giftedness and creativity, provided with progressive levels of knowledge; with the aim of continuing to build quality cumulative scientific experiences, which increase in depth and diversity as students' progress in participation year after year.

Due to the importance of the skill aspect, Mawhiba included in this program a set of skill packages that deal with building basic and important life skills for gifted students, and contribute to the development of personal, social, and innovative skills that keep pace with the skills of the twenty-first century, such as communication skills, leadership, critical and creative thinking, decision-making, problem-solving, digital security, and other skills.

Inventions

Stage: Exploratory
Path: Engineering science

Unit description

Did you know that the idea for the microwave oven was set in motion by a melted chocolate bar? While standing in front of a magnetron, inventor Percy Spencer noticed that his treat had begun melting in his pocket. To further test the potential of the magnetron, Spencer held a bag of corn kernels next to it and watched them pop. Whether it is this simple experiment that led to the microwave oven or the students' own creations, this unit is about inventors, inventions, and their impact on our world.

How does a toaster work, and what might make it work better? How can a package be designed to mail a potato chip so that it does not break? In this unit, students dismantle gadgets to figure out how things work and use ordinary household items to create new inventions. Students apply for mock patents, collaborate with their fellow inventors, keep an inventions journal, and work in teams to create hovercrafts or design more effective burglar alarms. In addition, students research the lives and innovative ideas of inventors past and present.

Throughout the process of inquiry, discover, and problem solving, students explore not only the how and why of various discoveries and inventions, but also their impact across the centuries. This integrated examination of inventions in our world offers young inventors a fuller understanding of the implications and promise of the creative imaginings.

The skills that students will acquire

Students will be able to build and develop basic skills, such as "teamwork, problem solving, reading, and analyzing scientific literature, demonstrating understanding through oral and written communication, in addition to several targeted skills, which are provided through training packages appropriate to the age group, provided by Specialized and trained staff, including:

- Future vision.
- Logical thinking.
- Positive personal values and traits
- Take responsibility
- Self confidence
- Pursuit of excellence

Program components

- A specialized enrichment scientific unit.
- Practical activities and scientific projects.
- Skill activities.

How to implement the program

The program, with its scientific and skill components will be implemented in attendance (face to face) or in virtual classes (distance learning).

Be a Scientist: Biology and Medical Science

Stage: Exploratory
Path: Medical, Biological and Chemical Sciences

Unit description

What is a biologist? What is a medical scientist? On what types of projects and experiments do different biologists and medical scientists work? In this unit, students learn about different types of biologists and medical scientists. They participate in hands-on activities like what biologists and medical scientists do in their jobs. To better complete experiments and engaging hands-on activities, students are exposed to basic biology and medical science concepts such as heredity, chemical reactions, human body systems, sterile technique, and forensic testing procedures.

Students examine strategies and techniques used by biologists and medical scientists and put them into practice. For example, students are guided in a real-life survey of their local ecosystem to determine the diversity, abundance, and behavior of the different organisms inhabiting the area. Role-playing the work of archaeologists, student teams develop the skills needed to survey a "dig site" using a variety of methods and tools. As toxicologists, students test, under controlled conditions, the effects of drugs on simple organisms. Students explore molecular biology as they use basic materials and methods to extract and describe a DNA sample. Students are trained to perform a wide array of simple laboratory examinations and analyses that might be used by forensic scientists .

As they learn about different types of biologists and medical scientists, students also learn how to experiment and complete designs. By the end of the unit, students acquire a better understanding of the work done by biologists and medical scientists.

The skills that students will acquire

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Be a Scientist: Physics and Engineering

Stage: Exploratory
Path: Engineering science + Physics, Earth & Space Sciences

Unit description

What is a physicist? What is an engineer? On what types of projects and experiments do different physicists and engineers work? In this unit, students learn about different types of physicists and engineers. They participate in hands-on activities like what physicists and engineers do in their jobs. To better complete experiments and engineering design challenges, students are exposed to basic physics and engineering concepts such as kinematics, buoyancy, electricity, and forces.

Students examine strategies and techniques used by engineers and physicists and put them into practice. For example, as manufacturing engineers; students design, test, and improve an assembly line process. As experimental physicists they use the scientific method to verify Newton's Laws. As electrical engineers they design electrical communicators. Drawing upon the concepts they learn, students design and create a model amusement park ride.

As they learn about different types of physicists and engineers, students also learn how to experiment and complete designs. By the end of the unit, students acquire a better understanding of the work done by physicists and engineers.

The skills that students will acquire

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A journey in the world of numbers

Stage: Exploratory
Path: Computer Science & Applied Mathematics

Unit description

What does a subatomic particle measured in femtometers have in common with a galaxy measured in light years? Both are a part of the uniquely human effort to quantify the world around us. In this unit, students explore numbers, from the very small to the unimaginably large, and learn how numeric representations help to explain natural phenomena such as time, distance, and temperature.

Moving beyond traditional arithmetic, this unit centers on hands-on activities that develop understanding of the scope and scale of numbers. Students consider such questions as: does the camera add 10 pounds? They develop approximation and computational strategies for learning scientific notation and determine whether answers to problems are reasonable. In examining the diversity of measurement systems, students learn the origins of some familiar and unfamiliar methods of measurement and invent their own units of measurement. Additionally, students use dimensional analysis to investigate conversions between different scales or systems of measurement. They apply concepts of ratio and proportion by constructing and analyzing scale models of our solar system, the human body, and other objects in our natural world.

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Chemistry in our life

Stage: Exploratory
Path: Medical, Biological and Chemical Sciences

Unit description

In this unit, students are introduced to the role played by chemistry in their everyday lives. Students learn about the states of matter, the changing states of matter, and colligative matter through ice melt, dry ice, and freezing point of ice laboratory investigations. They explore different types of mixtures and then make their own mixture—salad dressing. Students learn about subatomic particles and build models of atoms. They witness endothermic reactions in their bread-baking activity. During the focus on chemistry in the kitchen, students learn about enzymes, fermentation, and food preservation by doing hands-on activities. Additionally, students learn about the properties of water, chemical reactions and biological molecules, acids and bases, polymers, colors and pigments, and other concepts. Throughout the unit, laboratory investigations, hands-on activities, and discussions deepen students' understanding of the unit concepts.

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Discover your environment

Stage: Exploratory
Path: Physics, Earth & Space Sciences

Unit description

Why do animals adapt? What are the advantages of renewable energy? What do environmental scientists do? In this unit, students discuss these questions and more as they learn about the different types of scientists who work in the field of environmental science. They participate in hands-on activities like what environmental scientists do in their jobs. For example, as soil scientists they construct soil profiles. As topographers they learn about topographic maps and make clay landforms. As geologists they simulate core sampling. As environmental biologists they consider how the spread of disease can cause population decline. As environmental engineers they focus on green space and its benefits .

In a multi-day project, students act as meteorologists. First, they build barometers, thermometers, wind vanes, anemometers, and rain gauges. They assemble the devices into a weather station with which they collect and analyze weather-related data. As they learn about different types of environmental scientists, students also learn how to experiment and complete designs. By the end of the unit, students acquire a better understanding of the work done by scientists working in the field of environmental science.

The skills that students will acquire

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Be a programmer

Stage: Exploratory
Path: Computer Science & Applied Mathematics

Unit description

At the start of the unit, you will learn about the impact of computer science and programming on the world. This will help you to appreciate the innovations that you will create during the program. Specifically, you will learn about how computers have evolved over the years and understand the physical and intangible components that make up computers. Your teacher will then take you through the theoretical concepts of programming which will lead to a practical introduction to Scratch. You will then have a hands-on experience and cover the main concepts in Scratch which include event listeners, sprites, motion, control, and variables. Be excited to create stories, games, and animations in Scratch.

After completing the tutorial son Scratch, you will learn how to design and develop websites. The first stage will involve learning about the basic concepts of designing and developing websites using HTML and CSS. This will help you to understand the basic HTML structure of every website and learn how to organize and style elements In HTML and CSS. Like Scratch, the classes will incorporate practical sessions which will help you style webpages by formatting background colors, headings, fonts, images, etc. The final part of the unit will require you to create a final project which will involve designing a personal blog website that will highlight all the things you are passionate about.

Aside from having technical tutorials, the unit will also have some fun games that will help you interact with other members of your glass through the fun games.

The skills that students will acquire

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