



## 11<sup>th</sup> Grade Course Offerings

### **Biotechnology** ♦

Thanks to biotechnology, students can now learn about themselves on the molecular level. Using cutting-edge methods and applications, students will conduct a series of hands-on inquiry lab activities to discover how fascinating this science can be. They will explore the structure of the DNA molecule and demonstrate that DNA exists in cells by locating it in dividing cells of an onion root tip. They will use PCR (Polymerase Chain Reaction) to amplify a specific segment and analyze it by gel electrophoresis to reveal genetic differences among individuals. A discussion session will highlight applications of this technology: DNA fingerprinting, gene therapy, genetically modified foods, genetics, and others.

**Duration:** Premium 3-hour Classroom Program with a follow-up visit to your school to analyze PCR results.

**Class Size:** 15-30 students

*Available at MNS or your school*

**TEKS:** Biology: 112.34 1ab, 2dfgh, 5ab, 6abgh, 9a

### **Diagnosis: The Body in Question** ♦

We are the sum of all our parts. Take a tour of some human body systems and learn how they interact. This program is taught from the perspective of a patient brought into a hospital emergency room to provide your students with a real-world experience unlike any other.

**Duration:** Standard 50-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

**TEKS:** Biology: 112.34 1a, 2fgh, 3a, 10a

### **Electric Theater** ✂

Explore the world of electricity and magnetism through this exciting (and “shockingly” cool) demonstration led by one of our educators. Student volunteers will join our presenter on stage to demonstrate the workings of Van der Graff generators, electromagnets, step-down transformers, Tesla coils and more!

**Duration:** 50 minutes

**Class Size:** 15-175 students at MNS, 30–250 as outreach

*Available at MNS or your school*

**TEKS:** IPC: 112.38 1a, 3ef, 5bcg

Physics: 112.39 1a, 3e, 5acdeg

### **Fire and Ice** ✂

This explosively entertaining program teaches about the states of matter in a unique way. Student volunteers help the presenter explore how temperature affects matter. Both physical and chemical changes are demonstrated using fire and liquid nitrogen.

**Duration:** 50 minutes

**Class Size:** 15-175 students at MNS, 30–250 at your school

*Available at MNS or at your school*

**TEKS:** Chemistry: 112.35 1a, 3e, 4ac, 9ac, 11ab

IPC: 112.38 1a, 3e, 5abe, 6a, 7ab

### **Ice Age: Last Extinction** 🌍

Earth's last major extinction event affected large mammals during the Pleistocene Era, some 12,900 years ago. The possible causes of this event are currently under debate. Students will explore evidence for one hypothesis by conducting hands-on investigations, collecting and comparing data, and reaching a conclusion on the validity of the hypothesis.

**Duration:** Premium 90-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

**TEKS:** Biology: 1a, 2fgh

Chemistry: 1a, 2dfhi

Earth/Space Science: 1a, 2dgl, 13d

IPC: 1a, 2cde

Physics: 1a, 2dfhk

### **Incredible Machine: Human Body Structure and Function** ♠

Have you ever taken a real ECG, analyzed your heart beat and compared that to your blood pressure? Or perhaps mapped your sweat glands on your skin and measured how active they become when you work? The human body is a dizzying array of systems designed to interact with one another and keep you functioning at your best. Select one of the following topics to study with your class, and we'll provide a menu of activities to choose from. All programs will utilize the technology of a PowerLab®, a physiology data acquisition system found typically at the university level.

- Cardio-pulmonary Physiology
- Musculo-skeletal Physiology
- Gastrointestinal Physiology
- Sensory Physiology

**Duration:** Premium 90-minute Classroom Program

**Class Size:** 15-30 students

*Available at MNS only*

**TEKS:** Biology: 112.34 1a, 2fgh, 3a, 4ab, 10a, 11a

### **Roller Coaster Physics!** ✂

Have you ever wondered why you lose your stomach, don't fall out of your seat on loops and get stuck against the side of a roller coaster car while riding your favorite ride? Join us in building your own mini coaster to find out why you don't really need to wear a seat belt on roller coasters! Using Vernier data logging sensors, find out how much force it really takes to have some fun!

**Duration:** Premium 2-hour Classroom Program

**Class Size:** 15-30 students

*Available at MNS only*

**TEKS:** IPC 112.38 2bcde, 3a, 4abcdef, 5ab

Physics 112.39 4abcd

### **Spend the Day with DNA** ♣

Explore the fascinating and rapidly expanding world of forensic science as your students perform hands-on DNA isolation and separation using gel electrophoresis. Each student will have an opportunity to isolate a spool of actual DNA during the class, and applications of DNA technology such as criminal forensics and gene therapy will be discussed.

**Duration:** Premium 3-hour Classroom Program

**Class Size:** 15-30 students

*Available at MNS or your school*

**TEKS:** Biology: 112.34 1a, 2efgh, 3a, 5c, 6abdh

### **StarLab** 🌍

We will bring the stars to you with our state-of-the-art digital portable planetarium. Students will be guided through their discovery of constellations to the immense size of the universe. They will explore star movement, color and brightness, and learn how to locate stars and constellations. This program is well suited for both cultural and scientific studies.

**Duration:** 50 minutes

**Attendance:** 10 - 30 students (depending on students' age)

**Requirements:** large air-conditioned indoor room with dimensions of at least 25 ft. X 25 ft and 13 ft. overhead clearance; 110 V electric outlet

*Available at your school only*

**TEKS:** Astronomy: 1a, 3abcd, 4abcd, 5abc, 6abc

### **Urban Nature Walk** ♣

Join one of the Museum Naturalist for a guided walk in our own backyard! With the aid of field guides and binoculars, students will identify and learn about urban wildlife, explore various habitats and learn about the diversity of life within the confines of the Metroplex. This program can be adapted for all grades and helps to reinforce food webs, pond ecology, adaptations and biodiversity. The nature walk is available any season, please dress accordingly.

**Duration:** Standard 50-minute outdoor program

**Class Size:** up to 25 students

*Available at MNS only*

**TEKS:** Aquatic Science 1a, 4a, 5d, 7ac

Biology 1a, 12b

Environmental Science 4b