

# Fernbank Science Center

Title:The Code ExperienceLevel:6th Grade

Location: Fernbank Science Center

Type:Single Visit (Experience)Length:4 hoursLimit:3 classes (Max. 96 students)

#### **Description**

Exploration, imagination, and cooperation, are the primary goals of this program as students rotate through three (3) different sessions: A Robotics challenge, A Planetarium Lesson and a "Think Inside the Box" activity. Students will explore the science and engineering behind a Sphero Spark+ robot that was featured in the latest Star Wars movie; search for clues in different wavelengths of light and decode current evening sky constellations and planets. Using problem-solving skills, they will also strive to "break the codes", as it pertains to Earth Science, in a modified "Escape Room" format.

# Please note: This is a four (4) hour program, however; the schedule does include 30 minutes for lunch. Schools are encouraged to bring bag lunches as Fernbank Science Center <u>DOES</u> <u>NOT</u> have a cafeteria.

Descriptions of the three individual sessions that make up the CODE Experience can be found below.



# Fernbank Science Center

Title: Star Wars Robot Science

Level: 6th Grade

Location: Fernbank Science Center

Type:Single Visit (Experience)Length:4 hoursLimit:3 classes (Max. 96 students)

#### **Description**

Students will explore the science and engineering behind a Sphero robot. Students will explore the process of writing code enabling robots to execute specific commands. The activities explored will include a basic programming introduction, APP overview, program a square, and square with loops. They will use materials provided (robots and iPads) to work in groups. This class is an introduction to a series of classes designed to expose students to the future of robotics and space exploration while completing engineering & design challenges.

#### Georgia Standards of Excellence:

**S6E1.** Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.

c. Analyze and interpret data to compare and contrast the planets in our solar system in terms of:

- size relative to Earth,
- surface and atmospheric features,
- relative distance from the sun, and
- ability to support life.

#### Vocabulary:

anemometer	gyroscope	motor	sensor	orbit
image	processor	computer	android robots	
canister robots	gripper			

#### Pre-Visit Activity

Poll students to see how many students have programmed a robot. Ask students if they have seen the latest Star Wars movie and if they are familiar with the robot BB-8.

#### Post-Visit Activity

The Lighting Lab in the Sphero education section invites interested students, teachers and families to participate in numerous activities involving math, science, and programming. These phenomenal hands-on activities are found at the following website http://www.sphero.com/education



# Fernbank Science Center

Title: Constellation Code

Level: 6th Grade

Location: Fernbank Science Center

Type:Single Visit (Experience)Length:4 hoursLimit:3 classes (Max. 96 students)

#### **Description**

Students will use a planisphere to explore the current night sky constellations, and diffraction grating to decode star light.

#### Georgia Standards of Excellence:

**S6E2.** Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon.

#### Vocabulary:

Planisphere constellation electromagnetic spectrum Infrared ultraviolet coordinates

#### Pre-Visit Activity

Students can explore <u>https://science.nasa.gov/ems/</u> to review parts of the electromagnetic spectrum.

#### Post-Visit Activity

Invite students to set their planispheres for tonight's sky and observe what's up. Then ask them to repeat the exercise one month from today. What differences are observed? What made the changes?



Title:Think Inside the Box!

Level: 6th Grade

Location: Fernbank Science Center

Type:Single Visit (Experience)Length:4 hoursLimit:3 classes (Max. 96 students)

### **Description**

Students will learn about the solar system, meteorological events, geological processes, conservation, renewable, sustainable, and nonrenewable energy sources,. They will serve as "Agents" on a planetary mission and use problem-solving skills to "Think Inside the Box!" as it pertains to Earth Science. They will find & understand clues, decipher codes, open locks and solve puzzles to "break the codes" in a modified "Escape Room" format.

### Georgia Standards of Excellence:

**S6E1.** Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved. **c.** Analyze and interpret data to compare and contrast the planets in our solar system in terms of: size relative to Earth,

**S6E2**. Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon. **a**. Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon. **b**. Construct an explanation of the cause of solar and lunar eclipses.

**S6E4.** Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather .d. Construct an explanation of the relationship between air pressure, weather fronts, and air masses and meteorological events such as tornados and thunderstorms.

**S6E5.** Obtain, evaluate, and communicate information to show how Earth's surface is formed **c**. Construct an explanation of how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle

**S6E6.** Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth. **a**. Ask questions to determine the differences between renewable/sustainable and nonrenewable energy resources, and how they are used in our everyday lives. **c.** Construct an argument evaluating contributions to the rise in global temperatures over the past century.

## STEM/STEAM

Students will use spheres of differing size to model planetary events and Ipad minis to interpret meteorological graphs.

#### Vocabulary

atomosphere biomass coal Earth Earthquake geothermal Igneous Lunar eclipse Metamorphic Moon nuclear sedimentary solar eclipse Sun tornado Volcano

## Pre-Visit Activity

Students should be able to work collectively and cooperatively in groups. SF/TF/KC/AW 2019-20

### Post-Visit Activity

Students will create a short presentation defending their form of fuel choice. (Details below) **S6E6.** Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth

L6-8WHST9: Draw evidence from informational texts to support analysis reflection, and research.

# **The Code Experience** - 6<sup>th</sup> Grade **Think Inside the Box! Post-Visit Activity**

Now that your team has successfully determined the codes, will your team succeed in being awarded the distinction of being the next Future Leaders of the World by completing the entire task?

Lets See.

Now that you have worked together to open your boxes, you will conduct research as a team to develop a presentation to Defend your Form of Fuel choice and convince the Agents for the Planet Earth Federation (APEF) that your team is ready to be awarded the highest distinction.

# Develop a video clip on an Energy Source

The objective of your short (2-5 minute) presentation is to provide the APEF with important information from you team. Think of it as a quick summary of the most basic but important facts!

## Defend your Form of Fuel! (sun, water, coal, wind, natural gas etc..)

(Use your resources.. iPads, chromebooks etc..)

Production Team Name:\_\_\_

Production Team Member names:

1.	
2.	
3.	
4	

In Summary! Your presentation should:

Say it.
Explain it.
Repeat it.
SF/TF/KC/AW 2019-20

Initial Idea: Explain what your team wants to do:

We will Research and decide (collectively) on a preferred Form of Fuel!

(fill in here\_\_\_\_\_)

We will then develop a short presentation/video which highlights our choice."

Complete the form below and review several times before you start "recording" or are ready to present! (Consider points such as cost to extract, availability, etc..:)

Chosen Fuel source: \_\_\_\_\_

Pros:

Cons:

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# Sample Script Outline:

We are (state your names)	
and we will discuss the Pros and Cons of using	as a fuel source.
We will ultimately promote the use of	as a fuel source, because
(3 PRO statements)	
2.	
3.	
However; we realize (2 CON statements)	
1.	
2.	
(1 FINAL STATEMENT) Therefore, we select	as our form of Fuel because
Final statement:	