

SCIENCE - TECHNOLOGY - ENGINEERING - ARTS - MATH

"Codes and Coding" March 18, 2020

(The theme includes both secret codes and computer codes.)

ACTIVITIES FOR ALL AGES

PLACE: Park Forest Baptist Church

TIME: 8:45 - 2:30

(Families with young children can do just morning.)

COST: \$12 per student, or \$30 per family (Families doing just a half-day: \$8/child, \$20/fam.) Babies and toddlers are free.

LUNCH: "INDOOR PICNIC."

--Bring a bag lunch and a picnic blanket to sit on.
--We will provide: water, lemonade, chips, pretzels



To register, go to www.homeschoolSTEAM.org and click on "Codes and Coding" under the Events.

NOTES:

--Students ages 12 and under must have a designated chaperone on the premises. This is designed to be an event for you to attend with your children (as you would a museum). If you are in a situation that makes you unable to attend, please make arrangements for another parent to chaperone you kids for the day.

--We are working on possibily having some teen help for moms with babies and tots.

--You will need to read over the following pages and select the seminars that will be best for your student(s).













	PS	E1		E2	E3	MS	HS
Time	(Preschool)	(K-1 gr	ade)	(2-3 grade)	(4-5 grade)	(6-8 grade)	(9-12 grade)
8:45 - 9:00				R	egistration		
9:00-9:30	Exploration	Robot Race	s, Coding	Potato Pirates, Cipher Gadgets, (combo: Robot	Potato Pirates, Cipher Gadgets.	Robot Wars, Decrypto,	Mayan Script Art,
9:30-10:00	Room	Bunnyz, Sou	ind Codes	Races, Coding Bunnyz, Sound Codes)	Robot Wars	Mayan Script Art	Decrypto
10:00-10:30	Music	- <u>1</u>		Cipher Gadgets,	Potato Pirates,	Robot Wars, Mayan	Robot Wars, Mayan
10:30-11:00	Robot Races (3- 4 yrs and up)	Exploratio		Potato Pirates, Sound Codes	Lipner Gadgets, Sound Codes	script Art, coaing History	script Art, coaing History
11:00-11:30	Indoor Playground Dine Exhibite in the	Indoor Playgroun d + Plus	Cipher Gadgets (Invisible	Potato Pirates,	Potato Pirates, Mayan Script Art,	Robot Wars, Mayan Scrint Art Coding	Robot Wars, Mayan Scrint Art Coding
11:30-12:00	Gym	Exhibits in Gym	Writing seminar)	Exploration Room	Coding History (with older group)	History	History
12:00-12:30	LUNCH: P	innic th	leme	Bring a ba	g lunch and a pic	nic blanket	
12:30-1:00	Anim	ial Sound		Animal	Potato Pirates, Cinher Gadrats	Potato Pirates, Cipher Gadrate Mayan Scrint	Robot Wars, Mayan
1:00-1:30	Codes/co	mmunicati	u	Exploration Room	Decrypto	Art, Sound Codes	Codes
1:30-2:00	Indoor Playgro	und +Plus E	Exhibits	Potato Pirates, Cipher Gadgets,	Potato Pirates, Cipher Gadgets,	Robot Wars, Potato Pirates, Decrypto,	Mayan Script Art, Decrypto, Enigma
2:00-2:30				Exploration Room	Robot Wars	Enigma Machine	Machine

STEAM "Codes and Coding" March 18, 2020

The theme includes both secret codes and computer codes.

Parents need to **read the following list carefully** and choose the topics that are a good fit for their student(s). Age level guidelines are given. If your student is outside the listed age guidelines he/she may still participate if you feel that seminar is appropriate for them.

For exact times that each seminar is available, refer to the chart that gives this information.

Robot Races game (preK to 2) [30 min.]

This is a whole-body action game that is played on a large mat on the floor. Players follow arrow clues in a way that simulates computer coding. Reading not required.

CoderBunnyz game (grades K to 3) [30 min.]

This game was invented by an 8-year old who was learning computer coding. With the help of her parents and some graphic artists, her game turned into a professional looking product for sale on Amazon. Players have rabbit tokens that move across the squares on the board using directional commands that simulate the commands in computer programs. Reading not required.

Exploration Room (preK to 4) (30 or 60 min.]

Various hands-on activities including a coding toy caterpillar, a coding mouse toy, pattern blocks, Egyption heiroglyph rubber stamps, and some letter puzzles for readers. (Room may also contain some extra activities not directlye related to codes.)

Indoor Playground Plus (pre-K-1)

The main gym will be set up as an indoor playground, plus it will have extra exhibits such as math number sharks fishing game, Ex-pour-i-ment Factory, and other things that need more space.

Music for preK (30 min.)

TBA music enrichment activity or presentation.

All of these seminars run for 55 minutes:

Sound codes (grades K to 12) (Topic will be tweaked for different ages.)

(This topic will be tweaked for each age group.) We will meet people (by way of video) in both Mexico and Turkey who use whistling as a code for their language. We will then develop our own whistle code and practice sending and receiving messages. (Each participant will get to take home their whistle.) We will also talk about Morse code, and for older students, tap codes. (Tap codes which were used by American prisoners of war in both World War II and the Vietnam War. We will use their "Polybius square" to send and receive some messages.)

Cipher Gadgets (grades K to 8)

This is a do-it-yourself room filled with hands-on activity stations for a variety of ages. Make cipher gadgets that disguise secret messages using wheels, cylinders, or other tricks. Experiment with the chemistry of several different types of invisible ink. Each participant gets to take home an invisible ink pen with UV light.

Potato Pirates (grades 3 to 8)

Based on a card game that has become a standard part of national programs that teach coding language to young children. It uses cards that have written commands, such as "if, then," "while" and "if, else." We've scaled up the game to fill the room, with little plastic potatoes riding around in cardboard sailing ships! Players will be assigned to a team (north, south, east, west) and each will have a small fleet of boats. Last boat still sailing wins the game. (But everyone wins because we learned so much about coding!)

Robot Wars (grades 5 to 12)

The Daleks have gone crazy and are battling each other in order to be the first one to reach the escape transport pad! (Daleks are famous evil aliens from the British TV series Dr. Who.) We've taken a coding board game and scaled it up to fill the room. Participants draw cards that are written in Java code, and must follow those instructions to move their Dalek. Coded instructions are designed to be understandable to those who don't know computer coding. (Example: for(current_position,right NOT blocked) {turn (right); move(1step, forward); / if (left IS NOT blocked) {turn (left);move (1step, forward); } else stop ();)

Mayan script art project (grades 6 to 12)

You've heard of the Rosetta Stone and how it was used to figure out the meaning of Egyptian hieroglyphs, but did you know that the Mayan culture also used glyph writing and it was equally difficult to figure out? When Mayan glyphs were finally deciphered, it turned out that they had an added feature the Egyptians never used-- the Mayans used letters to represent not just words or letter, but syllables (ba, be, bi, bo, bu, ma, me, mi, etc.) Their glyphs were all based on the shape of a square and a finished piece of writing looked more like a piece of artwork than a paragraph. We will look at their amazing carved glyphs, then use a "syllabary" to make to write our names, making them into a beautiful piece of artwork. (Pencils, ink, markers, watercolors)

Decrypto game (grades 6 to 12)

This is a group game that requires a lot of interaction between the players. The group is divided into two teams and each team encodes and decodes secret messages they are given. As this happens, the opposing team is trying to crack the code using both logic and eavesdropping. Be careful what you say, a spy might be listening!

Famous Codes and Ciphers in history (grades 4 to 12)

We'll travel through history quickly, as we hit some of the highlights of famous codes and ciphers from ancient to modern times. (For the most famous code of World War II, grades 6 and up can come to the seminar on the Enigma Machine.) We'll learn about the Greek's method of writing Scytale messages, the Roman Caesar Cipher, the Alberti cipher disc, the Vigenere Cipher, the cipher alphabet that ended the life of Mary Queen of Scots, George Washington's code, Thomas Jefferson's cipher wheel, the dictionary ciphers and the cipher wheels of the Civil War, and semaphore flag codes used by navies. Participants will get to take home some of these cipher devices and assemble them at home.

Enigma machine (grades 6 to 12)

This is a history based seminar, which will summarize the amazing real-life story of Germany's famous coding machine during World War II. This machine made an almost uncrackable code, and the only way the British were able to defeat it is by relying on Alan Turing to invent the world's first computer. The follow up activity will be to construct your own Enigma machine using a Pringles can. This paper can model works exactly the same way as the original, except without electrical wires. The wires are lines printed onto paper rings that twist and turn around the can. (This ingenious simulation device was invented by a British company, Franklin Heath, Ltd.)