Goodbye Summer Vacation

Created for the School Library System of the Genesee Valley Educational Partnership
by Brian Mayer - Gaming and Library Technology Specialist

Goodbye Summer Vacation is a Middle School Escape Experience that engages students with computational thinking concepts and skills. Students will explore logic, sequencing, block programming, efficiency, mirroring and more as they work their way through the experience.

Equipment:

- 1 large box: https://www.amazon.com/gp/product/B078H82L6C
- 2 small security bags: https://www.amazon.com/gp/product/B01L9JE2R2
- 1 Multilock hasp: https://www.amazon.com/gp/product/B00206QIR6
- 2 4-number locks: https://www.amazon.com/gp/product/B0746BYSG4
- 1 5-letter lock: https://www.amazon.com/gp/product/B000U5N2L4
- 1 3-digit lock: https://www.amazon.com/gp/product/B003P0WLXQ
- 1 Small envelope: https://www.amazon.com/gp/product/B06XKSLT11
- 1 Robot Eraser: https://www.amazon.com/gp/product/B007JY4NU8
- 1 QR reading device with internet
- 1 Blacklight
- 1 Invisible Ink Pen
- 1 Deck of cards
- 1 Manilla Envelope
- 1 Google form: http://bit.ly/evilinc

Printables:

- Autocard Valuator and Ace of Spades
- Block Programming Sheet and Orchard Grid Pieces
- Compression Puzzle
- Dated Notes
- Evil Plan
- Mirror Mirror Puzzle
- QR Code Puzzle Pieces
- ROYGBIV Label

Setup for each box:

Print and cutout the printable materials.
- Cut the QR Codes into 4 pieces, the green background is there to make cutting easier and to see the white edges more clearly.
- Cut the Orchard Grid pieces into 1x2 strips, cutting along the dark black line to split the 2x2 sheets. The exception is the piece with U, which is just a single square.
- Cut out the Autocard Valuator and the Ace of Spades
- Cut out the 4 Dated Notes
- Cut out the ROYGBIV label

In the Manilla Envelope, place the 4 dated journal notes, the compression puzzle, one piece of the QR code and the Evil Plan. Close the envelope and place it on the desk.

Take the deck of cards and remove all of the queens from the deck, they will not be used. Using the Invisible Ink Pen write:
- SAM on 4 of the spades cards
- JADE on 2 clubs and 2 red suited cards
- TOM on 2 spades, 1 club and 1 red suited card

Shuffle all the cards together, except for the queens which are not used. Place the cards, one QR code piece and the Autocard Valuator Program back inside the card pack. Place the deck into the large box.

Set the 3-digit lock to 961. Inside the one of the security bags, place one QR Code Piece, the Orchard Grid Pieces, a Robot Eraser and the Block Programming Sheet. If you are including a QR reading device, place it otherwise students can use a phone. Lock the bag with the 3 digit lock. Tape the Ace of Spades on the outside of the bag and then put it into the large box.

Place a QR Code Piece into a small envelope and place it into the large box. Also place a blacklight into the large box.

In the second security bag, place the Mirror Mirror Puzzle. Close the bag and, using the multi-lock hasp, lock the bag with the 5-letter lock set to LINES and a 4-digit number lock set to 3513. Place the second bag into the larger box.
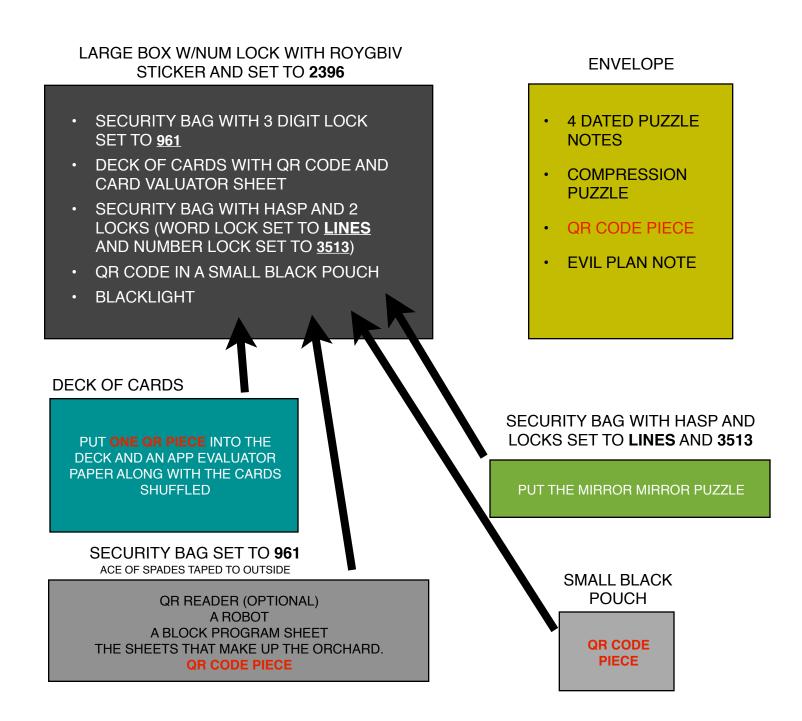
Lastly, lock the large box with a 4-digit number lock set to 2396. On this lock, tape the ROYGBIV label. Place the box on the table with the Manilla Envelope.

Read the intro to the players and begin.

Intro: *The Evil Dr. Doofenshirtz is a wicked and evil scientist who has a strong disdain for children. He is thought to have created a program that will hack into the upcoming school board vote. On the ballot is a vote to remove summer vacations and have school go all year long. The scientist has created a program to ensure the vote will pass and kids will be stuck in school all year long.*

Dr. Doofenshirtz's has been detained by the police and his materials were confiscated from his trunk. Inside was found an envelope and a box. It is up to your group to go through his materials and stop his fiendish plan before it is too late and you lose your summer vacation!!!!!

VISUAL SETUP

LARGE BOX W/NUM LOCK WITH ROYGBIV STICKER AND SET TO 2396

- SECURITY BAG WITH 3 DIGIT LOCK SET TO <u>961</u>
- DECK OF CARDS WITH QR CODE AND CARD VALUATOR SHEET
- SECURITY BAG WITH HASP AND 2 LOCKS (WORD LOCK SET TO <u>LINES</u> AND NUMBER LOCK SET TO <u>3513</u>)
- QR CODE IN A SMALL BLACK POUCH
- BLACKLIGHT

ENVELOPE

- 4 DATED PUZZLE NOTES
- COMPRESSION PUZZLE
- QR CODE PIECE
- EVIL PLAN NOTE

DECK OF CARDS

PUT **ONE QR PIECE** INTO THE DECK AND AN APP EVALUATOR PAPER ALONG WITH THE CARDS SHUFFLED

SECURITY BAG WITH HASP AND LOCKS SET TO LINES AND 3513

PUT THE MIRROR MIRROR PUZZLE

SECURITY BAG SET TO 961
ACE OF SPADES TAPED TO OUTSIDE

QR READER (OPTIONAL)
A ROBOT
A BLOCK PROGRAM SHEET
THE SHEETS THAT MAKE UP THE ORCHARD.
QR CODE PIECE

SMALL BLACK POUCH

QR CODE PIECE

- NOTE: you can split the QR codes up any which way, it does not matter which piece goes in which box/deck/envelope.

Play-through:

Players will look through the materials in the Manilla Envelope. Inside they will find 4 notes that talk about different projects that the doctor has worked on. A number in each of the dates on the four notes is colored a different color. When put into color order, as hinted at by the ROYGBIV label on the lock on the big box, the players can enter **2396** to get into the large box. They will also find a QR Code Piece and a Substitution Puzzle which they will use later.

Once inside the box, the players will find a deck of cards. Reading one of the notes, the players discover the doctor loved a card game and had 3 test subjects called Tom, Jade and Sam who helped as he worked on a program to determine the value of a hand of cards in the game. The players will use the black light to find the cards with the player's names on them: TOM, JADE and SAM. All of the cards with Tom's name on them form his hand. The same with Jade and Sam. Players will need to put them together and thenl use the Autocard Valuator program to determine the value of each card player's hand of cards (JADE = 30, TOM = 31, SAM = 32). The students will use these numbers to get into the security bag with the Ace of Spades. The label on the bag gives the hint "Middle Squared". If the players square the middle score of 31, they get 961 which will open the security bag. They will also find a QR Code Piece in the deck of cards which they will use later.

Inside the security bag the players will find a 3rd QR Code Piece and the materials for the Orchard Grid. Players will need to assemble the grid, using the sample grid shown on the Block Programming sheet. It shows that the A goes in the bottom left corner. and the J is in the top of the second column. The rest of the letters follow alphabetically from bottom to to. Column 1 is from A at the bottom to E at the top, followed by F to J, K to O, P to T, and U to Y.

E	J	O	T	Y
D	I	N	S	X
C	H	M	R	W
B	G	L	Q	V
A	F	K	P	U

→

Once together, the players will run through the Apple Picking Program. The program says that the robot will start on spot A. It will move forward 3 spaces. Forward is indicated by the arrow on the example grid, so the robot moves forward to P and picks 3 apples and turns 90 degrees left. It repeats this two more times, stopping on S to pick 5 apples and D to pick 1 apple. Lastly, the robot continues moving forward until it can't move anymore and picks 3 apples from A. This code 3513 opens one of the locks on the small box found in the larger box.

Players can open the last 5-letter word lock by solving the Compression Puzzle. Once solved, the letters for each word can be written into the spaces below the puzzle. The solution is:

Great fleas have lesser fleas,
Upon their backs to bite 'em,
And lesser fleas have lesser fleas,
and so, ad infinitum.

And those great fleas, themselves, in turn
Have greater fleas to go on;
While those again have greater still,
And greater still, and so on.

The circled letters on the sheet spell out LINES which opens the last lock on the small box. Inside, the players find a mirror puzzle. This will be used on the website where the players are going to stop the program.

To get the to website, the players will need to put together the 4 QR code pieces found in the manilla envelope that was first out, the deck of cards, the locked pencil case an in the small envelope found in the large locked box. When put together and scanned it takes the players to a submission form with security questions that will stop the program.

The site asks for 2 override codes:

- Royal Omission refers to the missing queens from the deck of cards. Players enter QUEEN in all caps.
- The second code refers to the Mirror Mirror Puzzle. In this puzzle, players need to flip the letters 2 times, once on the X axis and once on the Y axis to see which letters align with which numbers in the order that the letters spell out MIRROR. M=3 I=4 R=2 R=2 O=5 R=2. So the code is 342252

After successfully entering the codes, the players have successfully stopped the program. saved summer vacation and have won!

Resources:

Compression Puzzle:
http://www.cs4fn.org/compression/compressionpuzzles.php