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ESCAPE ROOM PLAN

Target group: 9th grade students of the Secondary Vocational Gymnasium

Subject: Informatics

OUTLINED LESSON PLAN

The venue of the game is a pre-arrange classroom. The game can be played by teams of 3-4. Duration: 40 minutes. Students must open a virtual safe. In order to get the combination that opens the safe, they need to find a QR code in the classroom. Each QR hides a task that, if solved correctly, will access to one of the numeric elements of the code. The tasks can be solved in any order, but the safe will only be opened if the sequence of numbers is entered in the correct order. When the students present the opened safe on their mobile phone, each member of the team will receive a School Note, which they can redeem during the school year and thus be exempted from writing a dissertation or answering once.

Framework:

Far back in time, rebellious students who founded our high school, using the knowledge of the ancient Jedi Knights, created the magical School Note. According to the Jedi tradition, the class of students that owns it does not have to write tests or assignments, and does not have to respond the teacher's questions for a week.

However, the Note was stolen by the teachers of the Dark Side, led by the evil IT teacher, and locked in a safe. It's your job now to find the five hidden QR codes inside the classroom! If you work well and solve the tasks, you will gain the six-figure sequence of numbers that can be used to open the virtual safe hiding the treasure: the SCHOOL NOTE.

MAY THE CODE BE WITH YOU!

Required tools:

- **Mobile phone with QR code reader**
- **Internet connection**
- **School Note printed in as many copies as the number of students in class**
- **paper, pencil for solving the coding tasks**
- **Printed QR codes hidden in the classroom and the final QR code affixed to the classroom door.**

Quiz questions and clues:

Password:

Which password is the safest?

a) Kitten123
b) 2010january2
c) 987654321
d) AxRz+z4L=61 (correct)

To whom you may tell your password?

a) to your best friend
b) to your teacher
c) to no one (correct)
d) to the old lady in the neighbourhood

When do you need to modify your password?

a) You need to change the default password when logging in for the first time (correct)
b) Regularly, but It's advisable every year (correct)
c) You don't need to modify a strong password
d) Only if it has been decoded

Mark the TRUE statements!

a) Do not save your password in the browser! (correct)
b) It is good to use the same password in all applications, because that way you will not forget it
c) Avoid using a password reminder! (correct)
d) Your password should be typical of you!

Which is the safest solution for mobiles instead of a password?

a) Nothing. Only a password is safe.
b) Face detection *(correct)*
c) Fingerprint reader *(correct)*
d) Pattern

Malware (pairing)

Virus	A malicious code, what infects when running.
Worm	It multiplies without human intervention, exploiting vulnerabilities. It makes your computer work slower.

Troyans	It installs a program disguised as a legitimate software on the computer and paves the way for the attacker.
Ransomware	They block access to the computer until a ransom is paid. They usually spread as worms or Trojans.
Rootkit	A software that modifies the operating system to open a "back door" to an attacker.
Spam	Unwanted messages sent on the Internet, that are made for such a purpose as advertising, phishing, spreading malware, etc.
Phishing	Fraud emails disguised as legal
Spyware	A program that is installed when browsing the Internet and steals user data.

Two-factor authentication (cryptography):

Multi-factor authentication means that a user can only gain access to certain personal data, documents, content if he or she proves his or her identity with multiple pieces of evidence. The first step is usually a password, the second is a key sent in an email or SMS. You can find out which service you know you can use with the help of the code wheel in the picture: IDFHERRNCJRRJOH!

The answer is: **Facebook Google**

Spam protection (decoder):

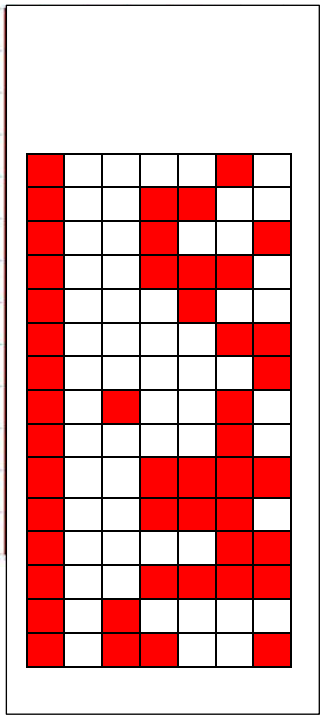
The figure hides a word that you can get by finding the letters.

Each line hides one letter.

The answer is a tip on what to do if you email multiple people who don't know each other.

ASCII BINARY ALPHABET

A	1000001	N	1001110
B	1000010	O	1001111
C	1000011	P	1010000
D	1000100	Q	1010001
E	1000101	R	1010010
F	1000110	S	1010011
G	1000111	T	1010100
H	1001000	U	1010101
I	1001001	V	1010110
J	1001010	W	1010111
K	1001011	X	1010111
L	1001100	Y	1011001
M	1001101	Z	1011010



The answer is: blind carbon copy

Phishing (code reader):

A typical method of phishing is hidden in this word board. Enter the code to find the description!

Steps are separated by hyphens, each step leads to a next letter. Start with **@**

! U1R1-D1R1-D2L1-D2R1-D4L1-R3U1-U6-L1D6-R2-U4-L2-D1R1-D7-L1

(U=up, D=down, L=left, R=right)

D	D	C	K	L	L
@	B	E	N	M	M
D	J	T	T	I	P
E	C	U	M	N	L
A	F	H	M	U	E
P	N	E	E	A	O
M	I	A	O	M	L
E	O	I	L	Z	C
I	A	F	V	T	E
R	P	Z	M	X	V
A	Z	T	A	U	B
Y	I	R	I	J	O
E	R	K	L	I	P
I	V	M	C	A	O
E	A	I	V	B	L
H	F	Z	A	N	T
F	U	O	I	E	M

The answer is: deceptive email

The combination of numbers that opens the safe is: 94718

Preparing Digital Resources and Other Supplies

The School Note	This is given to students who successfully complete the task and can open the virtual safe. (Larger, banknote size, of course)	
Password	A five-question quiz on secure passwords. The player cannot proceed to the next question until he finds the correct answer. Having found the correct answer, the team will get the first digit of the combination that opens the safe, which is 9.	
Malware	Students should pair the types of malware and their characteristics. If the solution is correct, the team will get the second digit of the number combination that opens the safe, which is shown in Figure 4.	
Two-level authentication	Students must use a code wheel to decode a cryptography that reveals what services they prefer to use for two-level authentication. If the solution is correct, the team will get the third digit of the number combination that opens the safe, which is shown in Figure 7.	

Protection against spam	Students are given a tip on how to send an email to multiple people who don't know each other, at once. The solution is to decode a colour code created with an ASCII code. In case of a correct answer, the team will get the fourth digit of the combination that opens the safe, which is shown in Figure 1.	
Phishing	Students must be stepping through a whiteboard following a code. With each step, they are given a letter, which they can put together to learn a kind of a phishing method. If the answer is correct, the team will have access to the fifth digit of the combination that opens the safe, which is shown in Figure 8.	
Safe	Enter the deciphered number combination here. This QR code hasn't been hidden. The code that opens the virtual safe is: 94718.	
The safe opened	https://dbimg.eu/i/m8qyvnj9bv.jpg	

Implementation of the Game and Summary of Experiences

In our school, each September begins with an “introductory” week in which 9th grade students can get to know the school and each other through playful tasks. The game was made for this occasion, the basis of which I also used for this escape room. Although I only tried the game with one class now, it was a great success this time as well.

The coupon (School Note), which exchanges one assignment or test, proved to be a good motivation again, and the gameplay also had a positive effect on the less active students.

The teams tried to get out of the room with several techniques. There were those who worked together, trying to solve the tasks together. And the new QR code was searched after one of the items in the safe-opening combination was obtained. Others were more specialized, there were code finders and code decoders. But each member of a team tried to deal with a task individually, and the numbers they gained were put into the “common”.

Experience has shown that most time was spent on coding tasks by teams. Using the ASCII code page translated to colours, more precisely interpreting the task, required a little help from several teams.

Overall, the escape room was a success, contributing to students’ knowledge of digital content protection.