Treasure hunt walktrough (basic version)

* CLUE 1: Caesar encrypted his messages by replacing each letter with the letter that is 3 places after it in the alphabet. Discover the secret message! WKHVHFUHWNHBLVQXPEHU

EXPLANATION OF CLUE 1: This clue results in a decrypted text "The secret key is number". The original text is encrypted using the Caesar cipher with key 3 (each letter is shifted 3 steps in alphabetical order) so that the encryption function is *e*(*x*)=*x*+3 mod 26, where *x* is the position of the letter to be encrypted, starting with position 0 for letter A. The decryption function is *d*(*x*)=*x*-3 mod 26, where *x* is the position of the letter to be decrypted.

* CLUE 2: Use the foils and discover the secret key.

EXPLANATION OF CLUE 3: By overlapping the transparencies and finding corresponding pairs, students get the image of a flower with six petals, a happy smiley face, a black circle, a six-pointed star, a number 9, and a black square.

* CLUE 4: The foils will tell you which Micro:bit is the right one, unlock it and it will tell you the instructions for the car!

EXPLANATION OF CLUE 4: Students must match the images on the transparencies and images on the Micro:bits. Only one image has a match: a black square. The message from Clue 2 is: the secret key is a number that, when combined with transparencies from the previous clue, gives a key to the Micro:bit, a number 9. Micro:bit has two buttons: A and B. On button B, the student selects a number (key): from 1 to 26. With button A, the student selects a letter to decrypt. By pressing A and B simultaneously, Micro:bit decrypts the selected letter with the selected key. Students decrypt the encrypted text of clue 4 with the Micro:bit and get the plaintext: “SRSLRSS”.

* CLUE 5: Run me and follow the path, and when the path disappears, listen to what the Micro:bit tells you (L: left, R: right, S: straight).

EXPLANATION OF CLUE 5: Students come to the road map where the track and the mBot are prepared. The earlier clue tells them the direction to go. Following the instructions of the sequence they discovered, students should reach the target field with the message "Good job!". The message must be illuminated with a UV lamp to reveal its meaning. If students made a mistake, they should go back to the spot and find the mistake and/or start over.

Treasure hunt walktrough (advanced version)

* CLUE 1: Caesar encrypted an alphabet letter by replacing it with the letter 3 positions down in the alphabet. Guess a number less than 10 and discover a secret message: “YTRNRFLNSJIYMWJJSZRGJWXQCCQQC”

EXPLANATION OF CLUE 1: This clue results in a decrypted text "TomImaginedThreeNumbersLXXLLX". The original text is encrypted using the Caesar cipher with key 5 (each letter is shifted 5 steps in alphabetical order) so that the encryption function is *e*(*x*)=*x*+5 mod 26, where *x* is the position of the letter to be encrypted, starting with position 0 for letter A. The decryption function is *d*(*x*)=*x*-5 mod 26, where *x* is the position of the letter to be decrypted.

* CLUE 2: Listen carefully to what Caesar says, lock the Enigma, and it will tell you what to do next: “OVDIDZPYOSDCYIUHTBDK”

EXPLANATION OF CLUE 2: Students must figure out a key for the Enigma device to decrypt the message given in clue 2. As written in instructions for Enigma, key consists of a three-letter word (TOM) and the sequence of gears numbered 50, 60, 70. The previous hint gives the order of the gears: LXXLLX, i.e. 70-50-60 in Roman numerals. After decrypting the cipher text in clue 2, students discover the plain text: “TheSecretKeyIsTheNumber”.

* CLUE 3: Put the transparencies together to figure out the secret key.

EXPLANATION OF CLUE 3: By overlapping the transparencies and finding corresponding pairs, students get the image of a flower with six petals, a happy smiley face, a black circle, a six-pointed star, a number 9, and a black square.

* CLUE 4: Transparencies help you choose the right Micro:bit. Unlock it and discover the robot's path to the treasure: “EBEJBEE”.

EXPLANATION OF CLUE 4: Students must match the images on the transparencies and images on the Micro:bits. Only one image has a match: a black square. The message from Clue 2 is: the secret key is a number that, when combined with transparencies from the previous clue, gives a key to the Micro:bit, a number 9. Micro:bit has two buttons: A and B. On button B, the student selects a number (key): from 1 to 26. With button A, the student selects a letter to decrypt. By pressing A and B simultaneously, Micro:bit decrypts the selected letter with the selected key. Students decrypt the encrypted text of clue 4 with the Micro:bit and get the plaintext: “SRSLRSS”.

* CLUE 5: Run me and follow the path, and when the path disappears, listen to what the Micro:bit tells you (L: left, R: right, S: straight).

EXPLANATION OF CLUE 5: Students come to the road map where the track and the mBot are prepared. The earlier clue tells them the direction to go. Following the instructions of the sequence they discovered, students should reach the target field with the message "Good job!". The message must be illuminated with a UV lamp to reveal its meaning. If students made a mistake, they should go back to the spot and find the mistake and/or start over.