Break the Code! (5th and 6th Class)

Resources: Caesar Cipher template and worksheet(see below)

Strands: Reason abstractly and quantitatively

Time: 60 minutes

Activity: As an introduction, you can begin with writing on the board: "Today we will be encoding secret messages" but backwards (similar to Leonardo Da Vinci's but not mirror backwards). Ask your students to decipher that sentence and chat about other cipher methods that students may be familiar with. The Caesar Cipher has a long history of usage, dating back to Julius Ceasar(100BC-44 BC). The cipher works by substituting for each letter the letter that is n letters further along the alphabet, where n is the key. Give each student a copy of Caesar Cipher template, they need to cut it out, and fasten the two wheels together e.g. using a paper clip. Two extra wheels, at the bottom of the page, are for pupils to encode using numbers and also to create their own code.

Questions: On the Worksheet

Challenge Questions:

• Why do you think this method was used by Julius Caesar?

• Do you think it would be effective nowadays?

• How could you improve it?

• How many different keys are there?

• Can you cipher using the wheel with numbers instead of letters?

• Can you create your own cipher wheel?

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Caesar Cipher - **is one of the earliest known and simplest ciphers. It is named after Julius Caesar(100-44 BC), who, according to Suetonius, used it with a shift of three to protect messages of military significance.** It is a type of substitution cipher in which each letter in the plaintext is 'shifted' a certain number of places down the alphabet. For example, with a shift of 1, A would be replaced by B, B would become C, and so on.

The discs, have the letters in the usual order. Sender and receiver must agree which circle corresponds to plaintext and which circle corresponds to ciphertext. The key is the shift, that sender and receiver must set. The original Caesar's cipher had a shift of 3. Knowing the key, the sender and receiver can create the plaintext/ciphertext correspondence as needed.

1.   Using the Caesar Cipher, encode your name and surname.

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2.   Encode Julius Caesar famous quote: "Experience is the teacher of all things." Use your own shift number. Pass it to your friend to decode, you must tell him the shift number.

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3.   Decode this message (another Julius Caesar quote), which was enciphered using the Caesar Cipher with a shift of 3:

L FDPH, L VDZ, L FRQTXHUHG.

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4.   Why do you think this method was used by Julius Caesar? Do you think it would be effective nowadays? How could you improve it?

5.   How many different keys are there?

6.   Now, when you know how Caesar Cipher works, you can sent some secret messages to your classmates. Remember to tell the receiver the key to your code!

Enjoy being the secret agent!

1. Cut out the circles

2. Place the smaller circle over the larger circle, and place a paper fastener or a clip, through the centre of both circles.

3. The two circles at the bottom of this sheet can be used alternatively if you want to encrypt your message with numbers or with your own signs.

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