

Name:

## Code Crackers!

Learn how to crack the code used by the famous Roman Emperor, Julius Caesar!

Complete this challenge for a chance to win a *Scientific Calculator!*



Over 2000 years ago  
I used a code to talk  
to my generals. Now  
you can learn how to  
crack it.....*Felix sis!*  
(That's Latin for  
"good luck")

## Year 6 – 7 Transition Project

This project is to be completed over the Summer Holidays and handed into your new Maths Teacher when you arrive at the Highfield School.

As you go through the project you will need to learn some new things. You could ask for help from family members or use the Internet or the Library to find things out for yourself. This project is all about code-breaking, an area of Mathematics which helped win World War 2 and now helps us with many things including using credit cards to buy things on the Internet. Good luck with the project and we look forward to seeing you in September.

### Task 1

The message below is written in a code called a Caesar Cipher (to find out more about who it is named after, look up Julius Caesar); this is a code where each letter of the alphabet is shifted. Your task is to **break the code and answer the question in the message**. The key is provided under the message. You might need to use the internet or ask someone older for help with the answer!

**Doha zvya vm ayphunslz pz Wfaohnvyhz' Aolvylt hivba?**

Key: A → H This means the letters are shifted from normal text to code according to the table below. To crack the code, you need to transfer each letter back from the code to the normal text.

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

**ANSWER Box**

## Task 2

Now it is time for a bit of cutting and sticking. **You are going to make a code breaking wheel** like the one on page 4 of this project booklet to help you crack the more difficult codes yourself. Be careful when using scissors and make sure you get an adult to help you. On the next page are some templates. Follow the instructions below to make your Caesar Cipher Wheel. You will need:

Glue stick, scissors (careful!), thin card (cereal packet should do), pen and split pin.

1. Glue each wheel to the card.
2. Cut carefully around the outside edge on one wheel, and the middle edge on the other so you have two wheels, one which will fit inside the other and both with space to write the alphabet on the edge.
3. Write the alphabet running clockwise around the edge of each wheel.
4. Carefully poke a hole in the middle of each wheel.
5. Use your split pin to join the wheels together.

You should now have a Caesar Wheel. This can be used to crack Caesar Codes. Line up the A on the outside with the H on the inside and you should find that you can use the wheel to crack the cipher from task 1. **Use your wheel to work out the following words using the given key.**

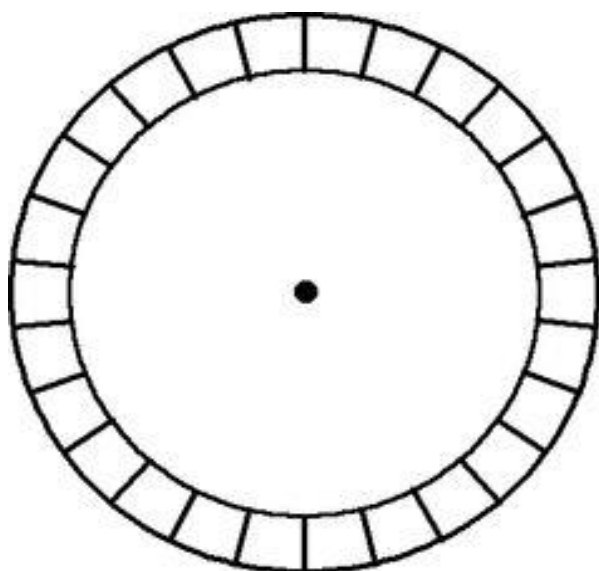
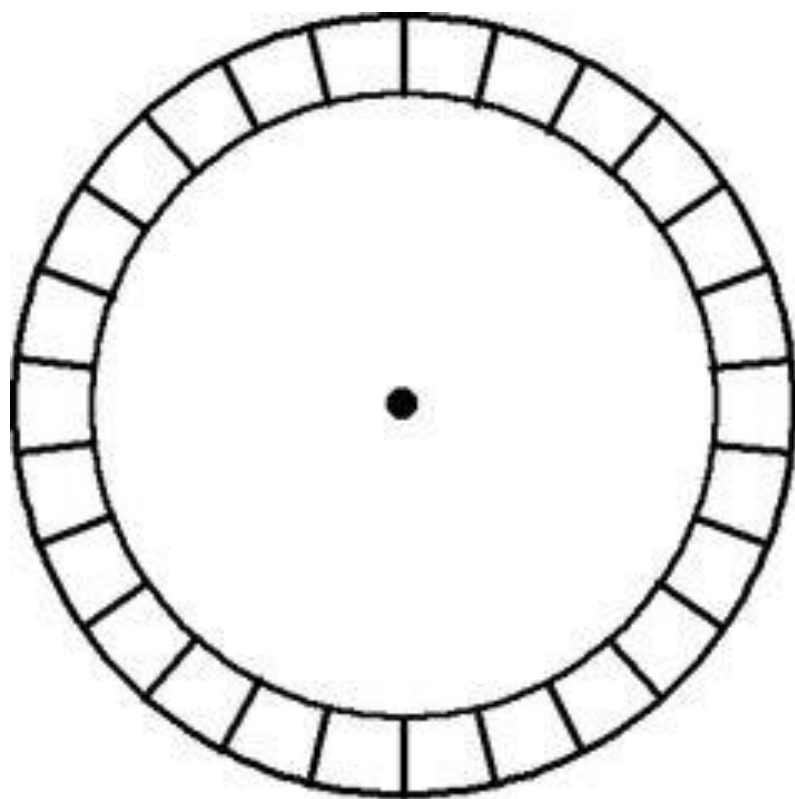
a) A → R (Line up A on outside with R on inside):

BZDJAN (transfer letters from the outside in)

b) A → T: WHYHSSLSVNYHT

c) A → P: ECLAPKTFX

**Bonus Marks: What is the name for the group of shapes that includes all of the words in these answers?**



### **Task 3**

Now that you have become an expert with a cipher wheel, it is time for a bigger challenge. **You are to solve the code below, which gives you a final task to complete, but you will not be told the key.** The only clue that you are given is that *the modal letter in the English language (and in the sentence) is e*. You may need to find out what “modal means before you go ahead, but once you know what it means, you should be able to work out which letter lines up to “e” and use this to crack the code.

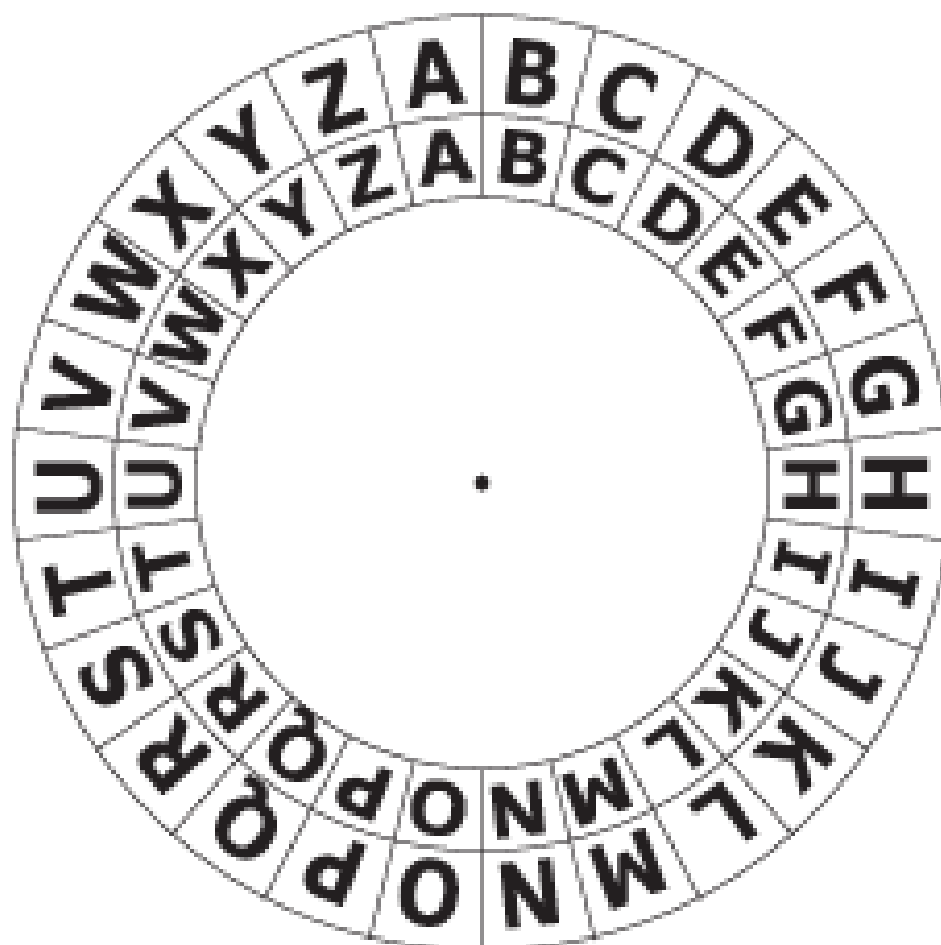
BPM “UWLM” QA I BGXM WN IDMZION. GWCZ NQVIT BIAS QA BW NQVL WCB EPIB  
BPM BMZUA “UMIV” IVL “UMLQIV” UMIV IVL NQVL BPM UMIV IVL UMLQIV WN BPM  
VCUJMZA JMTWE.

**5, 8, 13, 25, 31, 49, 72**

Answer Box

### **Bonus Task**

For an extra challenge, use your code wheel to encode a message to introduce yourself to your new Maths Teacher below to see if they can crack your code. You don't need to give them the key, but remember to keep it short as they may have a lot more to solve!



The project you have just completed was about one of the many different ways of encoding secret messages. The methods have a fascinating history. This particular method is said to have been used by Julius Caesar to communicate with his generals and a more complex version of it was recently used by a fugitive Mafia boss. The Italian police were able to crack his code and this led to his capture. The code was clearly more effective in the time of Julius Caesar than it is today – why do you think that is?

If you have enjoyed this project and want to find out more about codes and ciphers, there is an enormous amount of information on the Internet. Below are some recommended books that you can look at on wars and how important it is to have codes that are virtually uncrackable.

Simon Singh – The Code Book: the Secret History of Codes and Code-breaking

Fred Piper & Sean Murphy – Cryptography: A Very Short Introduction

Kjartan Poskitt – Codes: How to Make Them and Break Them  
(Murderous Maths)