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ARCANUM
STUDY GUIDE
CRIME SCENE DO NOT CROSS

Welcome Detectives!

Arcanum is a challenge of logic, observation, and interpretation. In this module, you will be required to analyze information critically, recognize patterns, and draw conclusions from incomplete or imperfect data. Some clues may be immediately clear, while others may require careful reasoning, cross-checking, or the application of basic cryptographic and analytical techniques.

This study guide is intended to familiarize you with types of tools and methods that may be encountered during the module. Not all techniques listed here will necessarily appear, and no single method will solve the entire challenge. Success in Arcanum depends on your ability to think logically, question assumptions, and connect evidence across different sources.

Read carefully, stay adaptable, and remember: clarity comes from reasoning, not guesswork.

Approaching the Investigation

- Arcanum does not follow a fixed or required sequence. Teams are free to explore different sections in any order, take notes and return to earlier observations as new information becomes available.
- Time management is entirely the responsibility of the team. Some areas may be more crowded than others at different points during the event, and teams may need to decide when to wait, move on, or revisit a section later.
- Teams may choose to stay together or divide tasks among members based on individual strengths. Clear communication and organized note-taking are strongly recommended, especially if information is gathered separately.
- Certain sections of the module may only be accessible once per team. Visiting such sections without all members present may make interpretation more challenging later, so teams should plan accordingly.
- Not all information will immediately appear relevant. Some observations may gain significance only when compared with findings from other sections.
- Success in Arcanum this year depends on careful reasoning, cross-referencing evidence, and revisiting assumptions rather than following a single linear path.

Ciphers

These are the ciphers that may be used on the day of the event:

ATBASH

ABCDEFGHIJKLMNOPQRSTUVWXYZ

ZYXWVUTSRQPONMLKJIHGFEDCBA

The Atbash code is just the alphabet backwards. For example, A would equal Z and vice versa. Encrypted text: "dv droo nvvg glnliild" Decrypted text: “We will meet tomorrow"

CAESAR CIPHER

The Caesar cipher is a code with a numeric key provided. The numeric key identifies how many letters one has to move backwards. For example, the letter F with key +3 would be C.

Decryption

Encrypted text: hqhpb zloo lqlwldwh dq dwwdfn zlwk lqidqwub

1. In this case +3

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

is now

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

Using the key to decrypt the code. In this case, ‘enemy will initiate an attack with infantry'

ROT 13

The ROT13 cipher is a substitution cipher with a specific key where the letters of the alphabet are offset 13 places. I.e. all “A"s are replaced with “N"s, all “B"s are replaced with "O"s, and so on. It can also be thought of as a Caesar cipher with a shift of 13.

ABCDEFGHIJKLMNOPQRSTUVWXYZ

NOPQRSTUVWXYZABCDEFGHIJKLM

To decipher a message, find the letter you wish to encipher in the top row, then replace it with the letter in the bottom row. Find the "N" in the top row, which is “A" in the bottom row. Continue until the whole message is done.

Ciphertext: NGGNPX NG QNJA

Plain Text: ATTACK AT DAWN

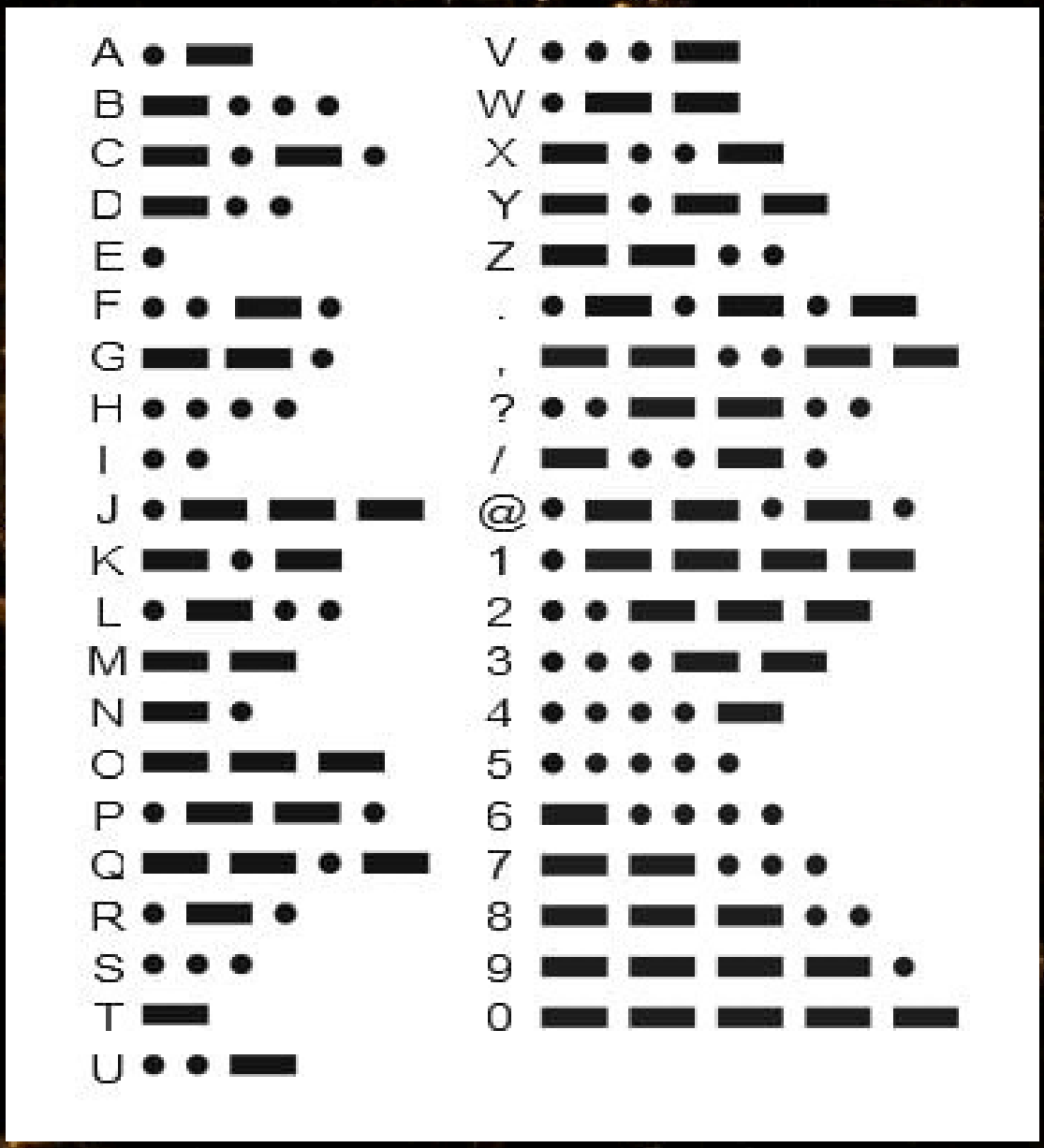
BINARY TO ASCII

The Binary code is a code that the computers recognize using only 1's and O's. You will be required to convert the binary code into the corresponding ASCII value to decrypt the text.

0	0011 0000	O	0100 1111	m	0110 1101
1	0011 0001	P	0101 0000	n	0110 1110
2	0011 0010	Q	0101 0001	o	0110 1111
3	0011 0011	R	0101 0010	p	0111 0000
4	0011 0100	S	0101 0011	q	0111 0001
5	0011 0101	T	0101 0100	r	0111 0010
6	0011 0110	U	0101 0101	s	0111 0011
7	0011 0111	V	0101 0110	t	0111 0100
8	0011 1000	W	0101 0111	u	0111 0101
9	0011 1001	X	0101 1000	v	0111 0110
A	0100 0001	Y	0101 1001	w	0111 0111
B	0100 0010	Z	0101 1010	x	0111 1000
C	0100 0011	a	0110 0001	y	0111 1001
D	0100 0100	b	0110 0010	z	0111 1010
E	0100 0101	c	0110 0011	.	0010 1110
F	0100 0110	d	0110 0100	,	0010 0111
G	0100 0111	e	0110 0101	:	0011 1010
H	0100 1000	f	0110 0110	;	0011 1011
I	0100 1001	g	0110 0111	?	0011 1111
J	0100 1010	h	0110 1000	!	0010 0001
K	0100 1011	I	0110 1001	'	0010 1100
L	0100 1100	j	0110 1010	"	0010 0010
M	0100 1101	k	0110 1011	(	0010 1000
N	0100 1110	l	0110 1100	)	0010 1001
				space	0010 0000

MORSE CODE

Morse code is a character encoding scheme used in telecommunication that encodes text characters as standardized sequences of two different signal durations called dots and dashes or dits and dahs. Following is the table used to decrypt morse code.



VIGENERE CIPHER

To decrypt, a table of alphabets can be used, termed a Vigenère table. It has the alphabet written out 26 times in different rows, each alphabet shifted cyclically to the left compared to the previous alphabet, corresponding to the 26 possible Caesar ciphers. At different points in the decryption process, the cipher uses a different alphabet from one of the rows. The alphabet used at each point depends on a repeating keyword.

One general rule to use the vigenere table is to know where the key column is and where the plaintext row is. The leftmost column is the key column and the top most row is the plaintext row. For example, suppose that the ciphertext to be decrypted is: LXFOPVEFRNHR

The person sending the message sends a keyword as well "LEMON". Now to decrypt, you have to repeat it until it matches the length of the plaintext, for example: LEMONLEMONLE

Each row starts with a key letter. The rest of the row holds the letters A to Z (in shifted order). Although there are 26 key rows shown, a code will only use as many keys (different alphabets) as there are unique letters in the key string, here just 5 keys: {L, E, M, O, N}.

Next go to the row in the table corresponding to the key, finding the position of the ciphertext letter in that row and then using the column's label as the plaintext. For example, in row L (from LEMON), the ciphertext L appears in column A, which is the first plaintext letter. Next, in row E (from LEMON), the ciphertext X is located in column T. Thus, T is the second plaintext letter. The rest of the ciphertext is deciphered in a similar fashion:

CIPHERTEXT: LXFOPVEFRNHR

KEY: LEMONLEMONLE

PLAINTEXT: ATTACKATDAWN

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

For getting a better understanding of this clpher please refer to this video: https://youtu.be/K1SuiUu4kGO

Code Cipher

Code Cipher has its own alphabet of 26 symbols, each corresponding to a letter of the Latin alphabet. To decrypt a message with Code Cipher therefore replace each symbol with the corresponding letter.

Bean Cipher

Bean Cipher has its own alphabet of 26 symbols, each corresponding to a letter of the Latin alphabet. To decrypt a message with Bean Cipher therefore replace each symbol with the corresponding letter.

Letter	Symbol	Letter	Symbol
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	

NATO PHONETIC ALPHABET

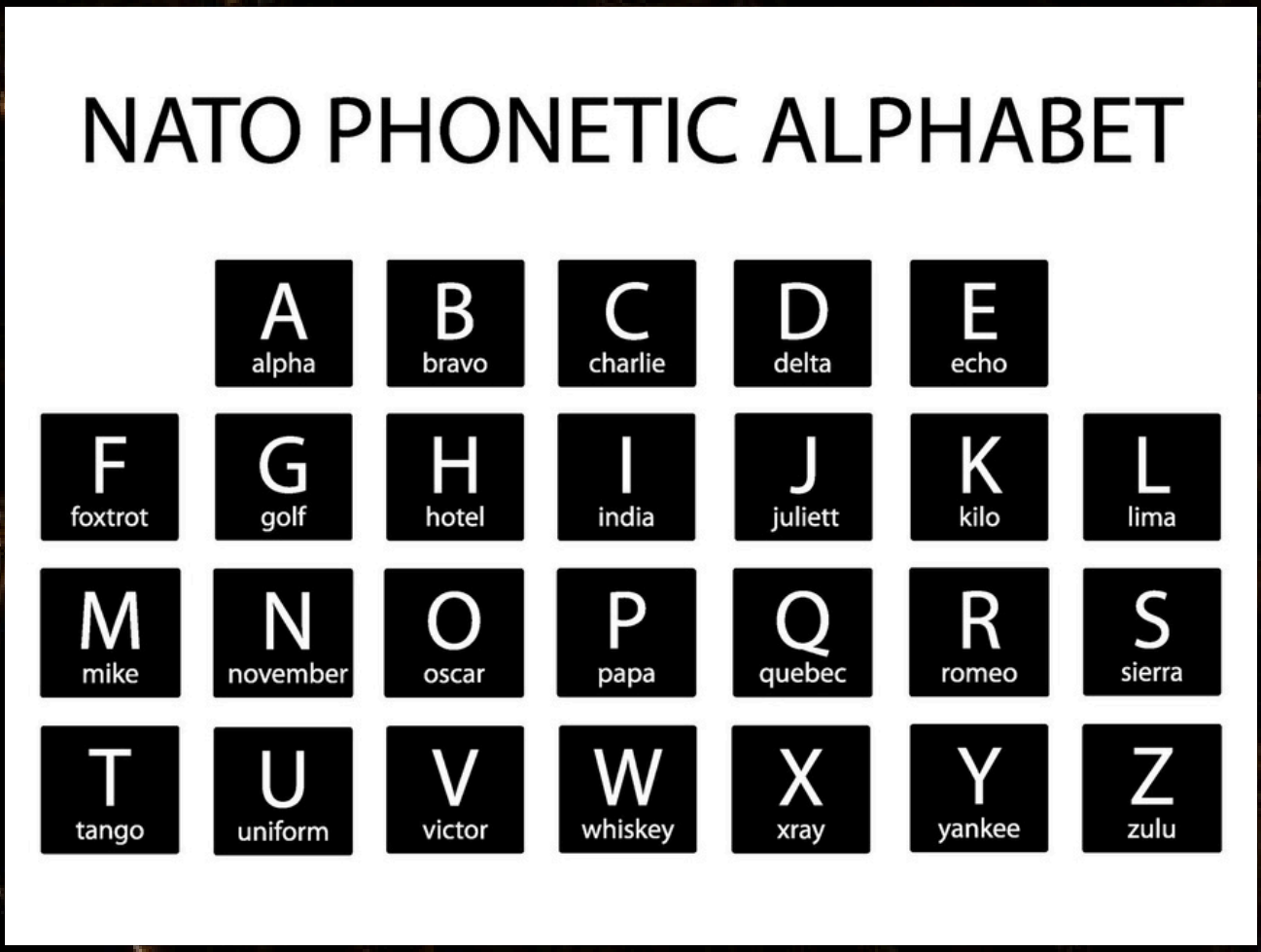
A phonetic alphabet used to spell out letters clearly in communication, especially in noisy or high-stress environments. Each letter of the English alphabet is assigned a distinct word, making it easier to convey and understand the letters, even if the transmission is distorted. Each letter is represented by a word chosen for its clarity and distinctness in pronunciation. Digits 0-9 also have distinct pronunciations to avoid confusion. The words and pronunciations are standardized internationally, ensuring consistent understanding across different languages and accents.

Replace each letter in a message with its NATO Alphabet equivalent. For example:

Plaintext: HELP

Encoded: Hotel Echo Lima Papa

Below shown are the standard nato alphabets :



HEXADECIMAL

Hexadecimal (base-16) is a numeral system that uses 16 symbols: 0-9 represent values O to 9, and A-F represent values 10 to 15. In encoding, each character is converted to its ASCII value, which is then represented in hexadecimal format.

Decoding: Split hexadecimal values: If the hexadecimal values are concatenated, split them into pairs (1 byte = 2 hex digits). Convert each hex value to ASCII: Transform each hex value back to its ASCII equivalent.

For example, 48 (hex) becomes H.

Rebuild the original text.

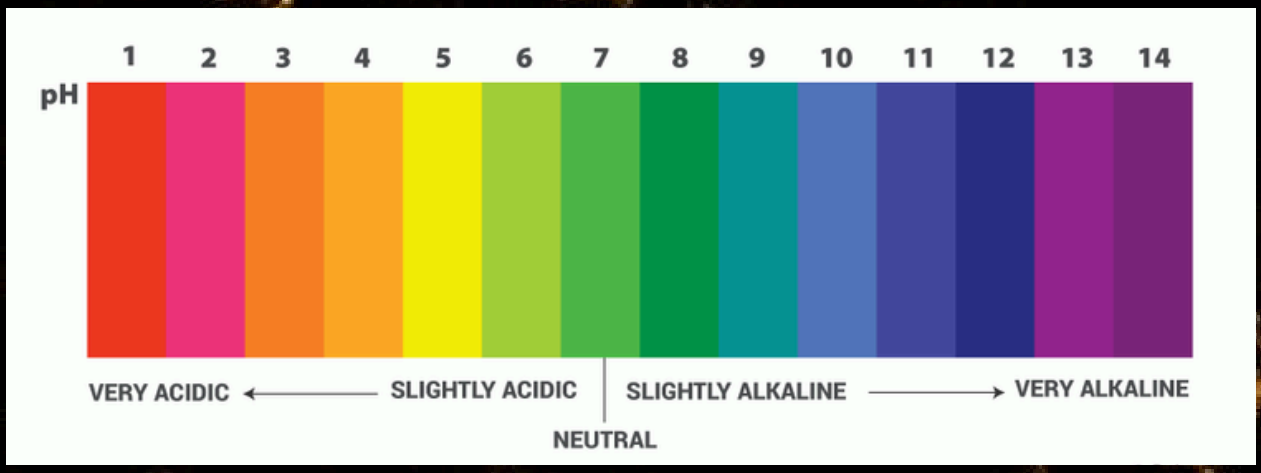
In addition to the techniques listed above, some encoded information may be solvable through contextual reasoning or pattern recognition within the module; therefore, this list is not intended to be exhaustive.

Working with Logs, Records, and System Data

- Logs are chronological records of system activity. Always begin by identifying when events occur and whether the sequence appears continuous or interrupted.
- Not all log entries are equally important. Routine status updates, background checks, and automated processes may provide context but do not always indicate meaningful change.
- Pay attention to transitions in the logs, such as sudden warnings, errors, anomalies, or system state changes. These often indicate moments where conditions differ from normal operation.
- Information may be spread across multiple logs or formats. Comparing records from different sources can reveal patterns or inconsistencies that are not visible in a single record alone.
- Some logs may contain missing, corrupted, or incomplete data. The absence of information can be as significant as its presence and should not be ignored.
- Technical logs often include identifiers, codes, or system-generated values. These do not always need to be decoded directly; instead, focus on how they change, repeat, or conflict across entries.
- System summaries and automated reports are useful for orientation but should not be treated as definitive. When possible, compare summaries against detailed records.
- When working as a team, clearly note timestamps, system actions, and observed changes so that findings from different sections can be accurately cross-referenced later.

Experimental and Chemical Observations

- Some elements of Arcanum may involve simple experimental interactions where materials respond to changes in their environment. These responses may not always be visible without careful testing or comparison.
- Changes in colour, intensity, or visibility can occur when materials are exposed to different conditions such as chemical treatment, light, heat, variations in concentration, etc..
- Certain substances may act as indicators, displaying different appearances depending on surrounding conditions. These changes may be subtle and require controlled application to distinguish meaningful results from background variation.
- Here is an example of a pH scale:



• The pH scale is commonly used to describe how acidic or alkaline a substance is. In many chemical contexts, changes in pH can be associated with visible observations such as colour changes when indicators are present. It is important to note that not all acid–base reactions rely on universal indicator. Different indicators may respond only under acidic or only under alkaline conditions, and some observations may be subtle rather than dramatic.

• Information may be revealed only when multiple conditions are applied. A single treatment may not be sufficient to produce an observable change, and sequential or combined interactions may be necessary.

• Some reactions depend on concentration or amount rather than the mere presence of a substance. Repeating an observation with altered quantities can lead to different outcomes.

• Light exposure, including sources not always visible to the eye, can alter how certain materials appear. In some cases, markings or patterns may only become apparent under specific lighting conditions.

• Not all experimental materials will respond in the same way. A lack of visible change does not necessarily indicate an incorrect approach and may instead suggest that different conditions should be tested.

• Successful interpretation relies on systematic testing, careful observation before and after interaction, and accurate note-taking rather than trial-and-error alone.