



CryptoClub Afterschool and Online: Broad Implementation

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CryptoClub Project

- Project began in 2001 - Various NSF funding followed.
 - I-CORPs
 - ITEST
 - DRK-12
 - Informal Science Education (ISE)
- Funded the development of curricular materials and the CryptoClub Website



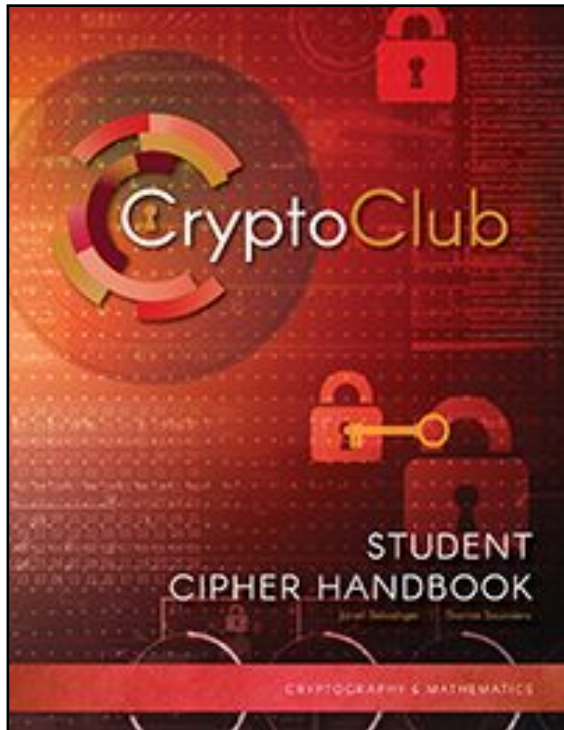
In a CryptoClub...



...middle grade students make and break secret codes.



Print Materials



Student Cipher
Handbook

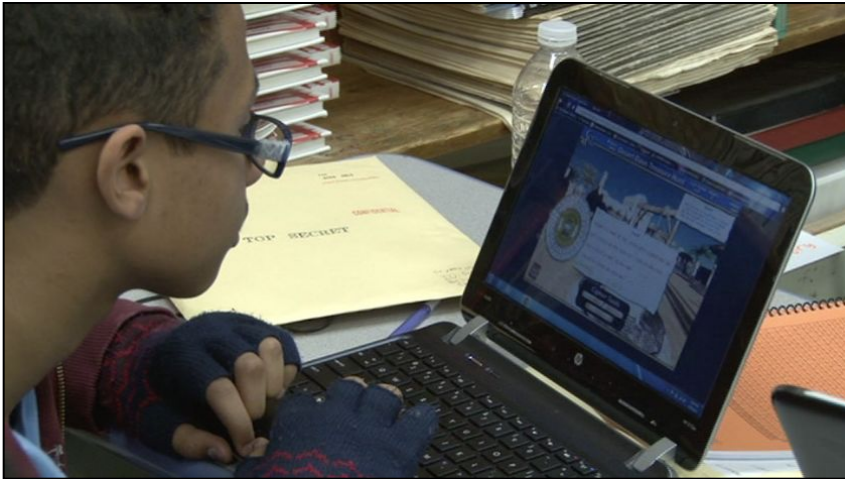


Leader Manual

Published by Kendall Hunt



cryptoclub.org



Provides youth with additional opportunities to learn and practice cryptography.





NSF AISL Broad Implementation

GOALS	OBJECTIVES
Increase participation	Establish trainer network (NGCP)
Increase learning	Create webinars for trainers & leaders
Become sustainable	Develop online training modules
	Launch digital badging system
	Create daily message challenges
	Design and launch online game




cryptoclub.org

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**Immerse Yourself in
Cryptography!**

Crack ciphers, discover secrets,
and improve your math skills!

- [Cipher Tools](#)
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**INTRIGUING MISSIONS
& EXCITING GAMES!**

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Cipher Tools



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Cipher Tools

Use these tools to help you encrypt, decrypt, and crack messages. You can type in your own messages or work with our samples.

Encrypting and Decrypting Tools

[Caesar](#)[Additive](#)[Keyword](#)[Substitution](#)[Multiplicative](#)[Affine](#)[Letter►Number](#)[Vigenère](#)

Cracking Tools

These tools can help decrypt when you don't know the key.


[Crack Substitution](#)[Crack Vigenère](#)



Cipher Tools



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Additive Cipher

Cipher Table

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
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

Encryption Key: [Sort by Ciphertext](#) [Reset](#)

11 14 18 23 16 18 16 23 24 01 10 23 03 18 02 23 24 03 02 24 22 04 12 17 10 02 17 10 22 14

10 02 11 14 18 23 16 04 23 06 18 21 18 23 16 03 24 21 14 10 01 23 . - 11 14 23

15 01 10 23 20 21 18 23

[Copy Plaintext](#) [Copy Ciphertext](#)

[Advanced Tips](#)

Decrypt Scratch Pad

Choose number to decrypt:

Subtract encryption key:

Reduce mod 26, if needed: ?

Change to letter:

[Clear](#) [Enter](#)

[Back](#) [Instructions](#) [Quick Answer](#)

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Crack Substitution Tool

About This Cipher

View Ciphertext Alphabetically

Show Numbers

abc

ABC

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

Reset All

ORFRE QMBNA AVLA L DCLZZ UEMBI MS
AVMBUVASBZ, PMCCWAARQ IRMIZR PLO
PVLOUR AVR GMEZQ. WOQRRQ, WA WD
AVR MOZJ AVWOU AVLA RFRE VLD. -
CLEULERA CRLQ

Copy Plaintext

Copy Ciphertext

Back

Instructions

Reveal a Letter

Letter Frequencies

Message

English(%)

A - 12.3	e - 12.7
R - 12.3	t - 9.1
L - 8.8	a - 8.2
V - 7.9	o - 7.5
M - 7.0	i - 7.0
E - 5.3	n - 6.8
O - 5.3	s - 6.3
Q - 5.3	h - 6.1
Z - 5.3	r - 6.0
C - 4.4	d - 4.3
U - 4.4	l - 4.0
W - 4.4	u - 2.8
B - 3.5	c - 2.8
D - 2.6	w - 2.4
I - 2.6	m - 2.4
P - 2.6	f - 2.2
F - 1.8	y - 2.0
S - 1.8	g - 2.0
G - 0.9	p - 1.9
J - 0.9	b - 1.5
N - 0.9	v - 1.0
H - 0.0	k - 0.8
K - 0.0	x - 0.2
T - 0.0	j - 0.2
X - 0.0	z - 0.1
Y - 0.0	q - 0.1

Show: % #

114 letters in message

Export Data

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Adventure Games





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Games



Desert Oasis

Follow a trail of Caesar cipher messages to free a djinni who's been trapped in a magic lamp for 1000 years.

[Play Online!](#)



VORTEX

Using a mysterious steampunk portal, journey through time and space to fantastical places where your cryptography skills are required to save the day.

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Challenges



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Crypto Challenges

[Leaderboard](#)

Crack mysterious messages, submit jokes for others to decrypt, and access secret messages within your private groups.

Take a Crack at Today's Message!

Today's Message

Message Board

Famous quotes, words of wisdom, and more. You just need to decrypt them! *The keys are revealed.*

Daily Messages

A collection of the daily messages from the past year. *The keys are not revealed, so they are more challenging.*

Joke Board

Why did the chicken decrypt the code? To get the joke, of course! Decrypt jokes, then encrypt and submit your own favorites. *The keys are revealed.*

Your Groups

Decrypt messages from your private message boards. You must first [Join a Group](#).

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Challenges: Message Board



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Message Board

Looking for a good message to crack? Choose from the list below!

Sort by... ▼

All Ciphers... ▼

All Difficulties... ▼

Clear Filter

Id	Cipher	Key?	Solved By	Theme
1	Caesar		1380	Welcome!
2	Caesar		1136	cryptoclub.org
3	Caesar		904	cryptoclub.org
4	Additive		774	cryptoclub.org
5	Keyword		382	About this cipher
6	Keyword		313	cryptoclub.org
7	Keyword		255	Cryptography
10	Multiplicative		188	Cryptography
11	Caesar		317	Cryptography
17	Multiplicative		161	Space
35	Affine		153	Lincoln Advice
41	Keyword		172	Advice
42	Affine		101	Advice
49	Multiplicative		98	Harry Potter
72	Multiplicative		97	President quote



Challenges: Joke Board



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Joke Board

Do you like a good joke? You'll have to decrypt the punchline to enjoy these! Get the ciphertext for the punchline of a joke, decrypt it, and submit the plaintext here to earn points.


[Submit a joke](#)

Sort by... [All Ciphers...](#) [Clear Filter](#)

Cipher	Submitted By	Submitted On	Solved By
Keyword	CROBVYMU RYVWOC-3806	10/19/2023	13
When does a brain feel afraid? MZWA SJ EBHWH SJH AWGLW.			
Caesar	CROBVYMU RYVWOC-3806	10/18/2023	21
Why did the cats ask for a drum set? KYVP NREKVU KF DRBV JFDV DVNJZT!			
Multiplicative	CLAUDE SHANNON-225	10/9/2023	12
What do you call a boomerang that doesnt come back? 00 12 17 14 10 24			
Caesar	Neal Koblitz-196	10/8/2023	17
Why did the computer catch a cold? EHFDXVH LW KDG WRR PDQB ZLQGRZV RSHQ!			
Keyword	CLAUDE SHANNON-225	10/4/2023	23
What do you call a magician when he loses his magic? TIY			
Caesar	CLAUDE SHANNON-225	9/27/2023	21
I invented a new word! RNCIKCTKUO			



New: Daily Messages



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Daily Message Board

Your daily message to crack!

December 2023 ▼

All Ciphers... ▼

All Difficulties... ▼

Clear Filter

Date	Difficulty	Cipher	Key?	Solved By
Tues Dec 05, 2023 Today's Message		<input checked="" type="radio"/> Additive	<input checked="" type="checkbox"/>	5
Mon Dec 04, 2023		<input checked="" type="radio"/> Caesar	<input checked="" type="checkbox"/>	4
Sun Dec 03, 2023		<input checked="" type="radio"/> Additive	<input checked="" type="checkbox"/>	3
Sat Dec 02, 2023		<input checked="" type="radio"/> Affine	<input checked="" type="checkbox"/>	4
Fri Dec 01, 2023		<input checked="" type="radio"/> Vigenère	<input checked="" type="checkbox"/>	8

h i j k l
G H I J K

q r s t u
v w x y z



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New: Badging System

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Your Badges



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New: Digital Game



Cipher Island





Coming Soon: CryptoClub App





Research Findings

- Mainly youth accessing website.
- Increase website usage leads to increased interest in cryptography.
- Users want:
 - More games.
 - More in-depth tutorials about how to encrypt, decrypt, crack.
 - More ciphers.
 - Extension of content into other STEM areas such as coding.



Questions, Dilemmas, Next Steps

- Appropriate balance of exploration vs. instruction on the website.
- Increasing usage of website.
- How to keep content current and engaging with the end of project funding.
- Future collaborations and funding opportunities.