

**Welcome to the  
NGCP National Webinar**

**CryptoClub Showcase**  
Exploring Mathematics in a Playful and Engaging Way

Thursday, May 21, 2020  
Please respond to the poll questions

NATIONAL GIRLS COLLABORATIVE PROJECT

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What is the clumsiest bee?

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B	C	V	N	C	M	J	O	H	C	F	F	

2

**Vision**

The National Girls Collaborative Project **brings together organizations** committed to informing and encouraging girls to pursue careers in science, technology, engineering, and mathematics (STEM).

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**NGCP Goals**

- Maximize access** to shared resources within organizations interested in engaging girls in STEM.
- Strengthen the capacity** of programs by sharing exemplary practice research and program models.
- Use the leverage of a network** to achieve gender equity in STEM.

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**NGCP Activities**

**Virtually:**

- Distribution and Content Projects
- **The Connectory – Collaboration Tool**
- **FabFems – Role Model Tool**
- E-Newsletter and Social Media
- Webinars – *Exemplary Practices*

**Local Collaboratives:**

- Professional Development: *Conferences and Forums*
- Incentives to Collaborate: *Mini-Grants*
- Newsletters and Local Resources

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**National Network of Collaborative Teams**

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### CryptoClub Showcase Speakers




Janet Beissinger      Lisa Kovalchick

Pam Hillestad      Lorena Harris



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### Cryptography and Mathematics


### Afterschool and Online

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### CryptoClub Project Team




Janet Beissinger      Bonnie Saunders      Cheryl Moran


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### Partners

 **NGCP**


- Karen Peterson
- Casi Herrera

 **Eduweb**

- Dave Schaller


 **EDC**

- Ginger Fitzhugh
- Jessica Brett
- Sara Greller


 **UIC**

- Henrique Cirne-Lima

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### In a CryptoClub Program ...



...middle-grade students use math to make and break secret codes.

Fits well in afterschool. Also fits in regular school.

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### What is the clumsiest bee?

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B	C	V	N	C	M	J	O	H		C	F	F		

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## What is the clumsiest bee?

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a	b	u	m	b	l	i	n	g	b	e	e
B	C	V	N	C	M	J	O	H	C	F	F

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## What is the clumsiest bee?


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a	b	u	m	b	l	i	n	g	b	e	e
B	C	V	N	C	M	J	O	H	C	F	F

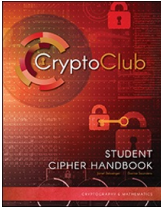
Cipher Table

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
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


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## Cipher Handbook




**Student Book**



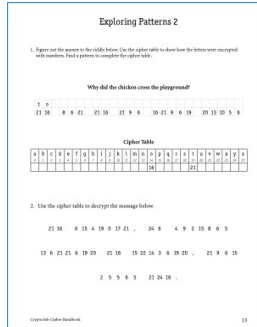
**Teacher's Guide**

Published by Kendall Hunt

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## Sample Cipher Handbook Page

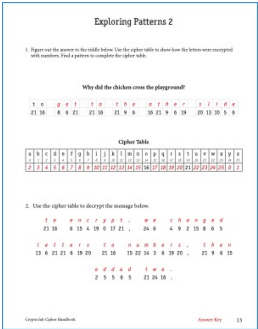


- What pattern was used to encrypt?
- Students figure it out themselves first
- Apply in activities that follow

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## Sample Cipher Handbook Page





- Students figure it out
- Cipher formally taught in later pages
- Apply in activities that follow

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## Sometimes student move around:



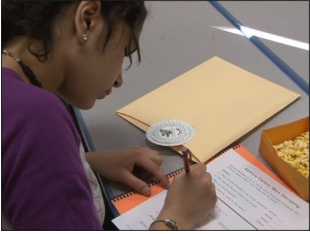


Treasure Hunt

Relay Race

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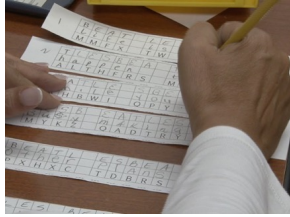
**Crypto Club** Quiet thinking



...other times they sit more quietly and think deeply about patterns that might help break a code.

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**Crypto Club** Jigsaw Challenge



A favorite style of activity involves a jigsaw in which each team member solves part of message. Putting the pieces together reveals the whole message.

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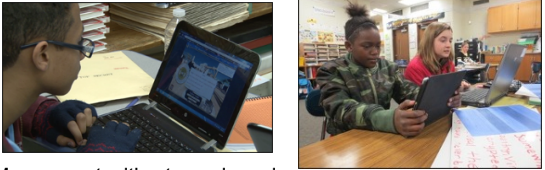
**Crypto Club** Opportunities to collaborate...



and the afterschool environment allows them to learn at their own pace.

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**Crypto Club** Online Activities: [CryptoClub.org](http://CryptoClub.org)



More opportunities to apply and learn cryptography.

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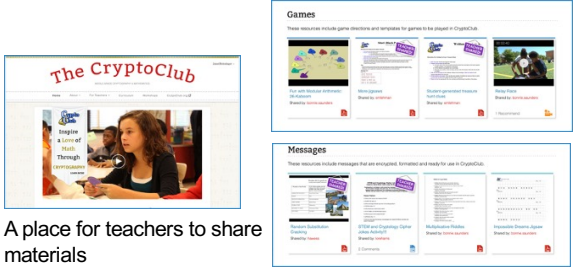
**Crypto Club** Student Website: [CryptoClub.Org](http://CryptoClub.Org)



**Cryptography Theme**  
**Cipher Tools**  
**Adventure Games**  
**Tools for Teachers**

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**Crypto Club** Teacher Resource: [VLC CryptoClubProject.uchicago.edu](http://CryptoClubProject.uchicago.edu)



A place for teachers to share materials

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**Crypto Club** Playful and Mysterious



We use secret codes as a hook for learning and applying mathematics

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**Crypto Club** Quotes from Students


- “What I liked the most is that it made me better at math and I learned how to do more math things. We all had fun together and I got to make new friends.”
- “I liked it because it was something new. It was something I hadn’t heard about. Yeah, it was really cool – a new experience.”

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**Crypto Club** From teachers:


- “It was valuable for students to see over and over that there wasn’t one formula to solve each puzzle or crack each code—that they had to employ a variety of strategies and consider the reasonableness of their answers along the way.”
- Some students “enjoyed being experts at something they [might not] have been selected for or assigned to had it been a club based on math performance.”

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**Crypto Club** NSF AISL Broad Implementation Grant 

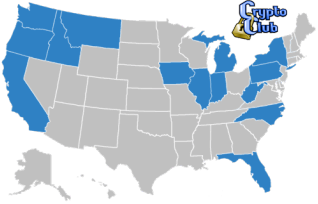
GOALS	OBJECTIVES
<ul style="list-style-type: none"> <li>● Increase participation</li> <li>● Increase learning</li> <li>● Become sustainable</li> </ul>	<ol style="list-style-type: none"> <li>1. Trainer Network-NGCP</li> <li>2. Webinars- trainers/leaders</li> <li>3. Online training modules</li> <li>4. Digital Badge System</li> <li>5. Weekly Challenges</li> <li>6. Multiplayer game</li> </ol>

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**Crypto Club** NGCP Partnership 

**Goal :** To develop a network of hubsites that train and support CryptoClub leaders in their regions.

17 hubsites



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**Crypto Club** 17 NGCP Training Hubsites


Cohort 1: 8 sites trained in 2017	Cohort 2: 9 sites trained in 2018
<ul style="list-style-type: none"> <li>• California University of Pennsylvania, California, PA</li> <li>• Glazer Children’s Museum, Tampa, FL</li> <li>• National Girls Collaborative Project, Seattle, WA</li> <li>• OregonASK, Wilsonville, OR</li> <li>• Pisgah Astronomical Research Institute, Rosman, NC</li> <li>• STEMIdaho, Boise, ID</li> <li>• University of Montana, Missoula, MT</li> <li>• West Virginia Statewide Afterschool Network, Charleston, WV</li> </ul>	<ul style="list-style-type: none"> <li>• Girls Inc of Sioux City, Sioux City, IA</li> <li>• Fairytale Town, Sacramento, CA</li> <li>• Wayne State University, Detroit, MI</li> <li>• Girls Inc, National, Indianapolis, IN</li> <li>• Bartholomew County Public Library, Columbus, IN</li> <li>• New York State Network for Youth Success, Rochester and Schenectady, NY</li> <li>• Women’s Enterprise Skill Training of Windsor Inc. (WEST), Windsor, ON, Canada</li> <li>• Power of US Foundation and Urban Tech Fair, Washington, DC</li> <li>• Washington Alliance for Better Schools, Seattle, WA</li> </ul>

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### 4-day training in Chicago



- 4- day Chicago training
- 2 trainers per Hubsite
- Learned the CryptoClub curriculum
- Learned to train CryptoClub leaders


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### Monthly Community Calls

- Trainers shared experiences
- Discussed common issues


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### Challenges

- Recruiting club leaders
- Amount of time needed for training
- Funding for hubsites and clubs
- Full implementation of the curriculum
- Inconsistent attendance in afterschool programs


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### Successes

- The partnership with NGCP connected the CryptoClub team with trainers from around the country
- Trainers found opportunities to build partnerships within their communities and states.
- Club leaders reported CryptoClub filled a need for more math and problem-solving programs in middle school
- Students enjoyed the program: High level of student interest, engagement, and enjoyment reported by Hubsite trainers and club leaders


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### What's next

- Online PD modules
- Online games and a badge system (2020-21)
- Partnership with new publisher

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## Resources



- Website for students  
[Cryptoclub.org](http://Cryptoclub.org)
- Teacher resources:  
[Cryptoclubproject.uchicago.edu](http://Cryptoclubproject.uchicago.edu)
- *CryptoClub Cipher Handbook*:  
[Kendall Hunt Publisher](#)

More information:  
Janet Beissinger (beissing@uchicago.edu)

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## What People are Saying


- A post-workshop survey indicated 100% of CryptoClub workshops participants were “Very” or “Extremely” satisfied.
- A few quotes from participants concerning the most valuable aspect of the workshop:
  - “Being able to have something to teach CS with an offline curriculum option.”
  - “material that can easily be integrated into an existing program”
  - “It is a program that I can use with my students as soon as tomorrow.”

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## Who is Using it in PA?


- Libraries
- Teachers
- Intermediate Unit Staff
- Early Learning Centers
- YMCA
- Various Afterschool Programs



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## What age groups?


- In-School
  - Elementary school classes
  - 5<sup>th</sup> grade field trip activity
  - Middle school STEM class
- Libraries
  - Younger kids (1<sup>st</sup> grade and up)
- After school
  - COMETS (Courses On Math, Engineering, Technology, and Science)
  - YMCA



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## What kinds of activities?

- Part of a day-long field trip
- 2-hour Saturday session
- After school session
- Part of school day
- New: COVID-19 online sessions




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- Library Website
  - <https://www.southfayettilibrary.org/>
- YouTube Link
  - [https://www.youtube.com/watch?v=909\\_Eta\\_H0Q&feature=youtu.be](https://www.youtube.com/watch?v=909_Eta_H0Q&feature=youtu.be)



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## Florida Hubsite The Glazer Children's Museum

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**Highlights**

- working with educators
- becoming a part of the STEM community
- becoming a resource for and building relationships with educators



**Challenges**

- recruitment
- depth of curriculum
- lesson plans

**Way Forward**

- empowering teachers
- outreach in schools









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## CRYPTOCLUB PROGRAM FROM AN EDUCATOR POINT OF VIEW

From the NYS HUBSITE  
Lorena Harris







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## FROM AN EDUCATOR EXPERIENCE

- Tools, training, [CryptoClub.org](http://CryptoClub.org) and VLC
- Building a Virtual Learning Community
- The Support as Educators from the Authors and NGCP support has been great.
- Here are some examples
- Program impact in our community
- Building Virtual Learning
- We had fun! Using Math!












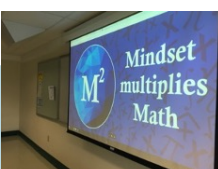


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## PROGRAM IMPACT IN OUR COMMUNITY


- Students from STEAM Academy and Union STEP programs
- College students developed a program called Mindset multiplies Math to increase fluency using different strategies (such as CryptoClub)






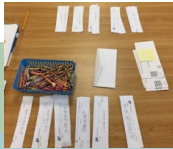

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## COLLEGE STUDENTS TOOK THE PROGRAM TO GLENCLIFF ELEMENTARY SCHOOL NISKAYUNA, NY

- Lesson plans for 3<sup>rd</sup> and 4<sup>th</sup> graders were focused in Cesar, Additive, Key Cipher and Multiplicative Ciphers.
- Students love the different games, riddles and decoding secret message
- The [CryptoClub.org](http://CryptoClub.org) website was a hit!
- Scavenger hunt was the final (closing activity)





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## PROGRAM IMPACT IN OUR COMMUNITY

- Schenectady Middle Schools (LPP) program keeps teaching with the Crypto Club curriculum (CCC)
- Summer STEAM Academy (middles school and HS students) learned and had fun with the CCC, and continues to use the CCC.
- Elementary Schools and library around the area learned and implemented CCC in their After School Programs





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## Discussion

How might you use CryptoClub resources in your programming?



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## Questions?



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## Upcoming NGCP Webinars



**Equity in STEM Education: The Connection to Culture**  
Wednesday, May 27, 2020



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