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

1. What is the clumsiest bee?

   A. B
   B. C
   C. V
   D. N
   E. C
   F. M
   G. J
   H. O
   I. H
   J. F

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).

NGCP Goals

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

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

National Network of Collaborative Teams
CryptoClub Showcase Speakers

Janet Beissinger  Lisa Kovalchick

Pam Hillestad  Lorena Harris

Cryptography and Mathematics
Afterschool and Online

CryptoClub Project Team

Janet Beissinger  Bonnie Saunders  Cheryl Moran

Partners

NGCP
- Karen Peterson
- Casi Herrera

Eduweb
- Dave Schaller

EDC
- Ginger Fitzhugh
- Jessica Brett
- Sara Greller

Eduweb
- Henrique Cime-Lima

UIC

In a CryptoClub Program ...

...middle-grade students use math to make and break secret codes.
Fits well in afterschool. Also fits in regular school.

What is the clumsiest bee?

B C V N C M J O H C F F
What is the clumsiest bee?

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

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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

Sometimes student move around:

- Treasure Hunt
- Relay Race

Sample Cipher Handbook Page

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

Cipher Handbook

Student Book
Teacher's Guide
Published by Kendall Hunt
Quiet thinking

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

Jigsaw Challenge

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

Opportunities to collaborate...

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

Online Activities: CryptoClub.org

More opportunities to apply and learn cryptography.

Student Website: CryptoClub.Org

Cryptography Theme

Cipher Tools

Adventure Games

Tools for Teachers

Teacher Resource: VLC

CryptoClubProject.uchicago.edu

A place for teachers to share materials.
Playful and Mysterious

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

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."

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."

NSF AISL
Broad Implementation Grant

GOALS

• Increase participation
• Increase learning
• Become sustainable

OBJECTIVES

1. Trainer Network-NGCP
2. Webinars-trainers/leaders
3. Online training modules
4. Digital Badge System
5. Weekly Challenges
6. Multiplayer game

NGCP Partnership

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

17 hubsites

17 NGCP Training Hubsites

Cohort 1: 8 sites trained in 2017
• California University of Pennsylvania, California, PA
• Glazer Children’s Museum, Tampa, FL
• National Girls Collaborative Project, Seattle, WA
• OregonASK, Wilsonville, OR
• Pajah Astronomical Research Institute, Rosman, NC
• STEMlahol, Boise, ID
• University of Montana, Missoula, MT
• West Virginia Statewide Afterschool Network, Charleston, WV

Cohort 2: 9 sites trained in 2018
• Girls Inc of Sioux City, Sioux City, IA
• Fairytale Town, Sacramento, CA
• Wayne State University, Detroit, MI
• Girls Inc, National, Indianapolis, IN
• Bartholomew County Public Library, Columbus, IN
• New York State Network for Youth Success, Rochester and Schenectady, NY
• Women’s Enterprise Skill Training of Windsor Inc. (WEST), Windsor, ON, Canada
• Power of US Foundation and Urban Tech Fair, Washington, DC
• Washington Alliance for Better Schools, Seattle, WA
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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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CryptoClub Cohorts 1 & 2

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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
Resources

- Website for students: Cryptoclub.org
- Teacher resources: Cryptoclubproject.uchicago.edu
- CryptoClub Cipher Handbook: Kendall Hunt Publisher

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

What People are Saying

- A post-workshop survey indicated 100% of CryptoClub workshop 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.”

Who is Using it in PA?

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

What age groups?

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

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
Florida Hubsite
The Glazer Children’s Museum

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

FROM AN EDUCATOR EXPERIENCE

- Tools, training, 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!

COLLEGE STUDENTS TOOK THE PROGRAM TO GLENCIFF ELEMENTARY SCHOOL NISKAYUNA, NY

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

CRYPTOCLUB PROGRAM FROM AN EDUCATOR POINT OF VIEW

From the NYS HUBSITE
Lorena Harris

SUNY SCHENECTADY COUNTY COMMUNITY COLLEGE

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)

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
Discussion
How might you use CryptoClub resources in your programming?

Questions?

Upcoming NGCP Webinars

SciGirls

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