Greater Cincinnati STEM Collaborative (GCSC)
STEM Bicycle Club and 3D Printer Club
2017-2018 Application Packet

GCSC helps prepare students to join the region's STEM (Science, Technology, Engineering, and Math) workforce through connected, robust learning pathways. STEM learning is propelled by business, education, and community collaboration and our culture of incubation, acceleration, and inclusion. Our vision is that the Greater Cincinnati tri-state region is a technologically rich & vibrant community with the most robust, talented STEM workforce and community in the country.

Due to the generosity of our supporters and demonstrated positive impact, GCSC will again support 3d Printers Clubs and STEM Bicycle Clubs during the 2017-2018 school year.

Any school / school partner interested to lead a GCSC 3d Printers or STEM Bicycle Club in 2017-2018 must submit their application online by Monday, September 18, 2016.

3d Printers Club

The GCSC 3d Printers Club is "heads on, hands on" project that uses an exciting, hot technology to engage middle school students . . . . 3d printers! For ten weeks after school 20 or more students design solutions to real problems using modeling software and a 3d printer. The club increases students' technical and problem-solving skills, exposes them to STEM career possibilities through the involvement of volunteer coaches and STEM professionals, and reinforces math and science principles taught during the school day.

The 3d Printers Club is designed for 5th and 6th grade students and aligned with both Ohio and Kentucky science and math standards (5th through 9th grades). Beginning in 2017-2018 the club offers two curriculums: Problem Solving Inventions and 3d Grand Prix. The program includes a culminating "3d Printers Showcase" event hosted at the University of Cincinnati. 25 clubs ran 2016-2017.

STEM Bicycle Club

The GCSC STEM Bicycle Club is a "heads on, hands on" project that engages 15 middle school students for 10 weeks after school. Students break down and re-assemble bicycles they get to keep. The club builds student confidence, problem solving, and persistence skills while bringing relevance to math and science principles taught during the school day. The club also exposes students to STEM career possibilities through the involvement of volunteer coaches and STEM professionals.

The STEM Bicycle Club is designed primarily for 7th and 8th grade students and aligned with both Ohio and Kentucky science and math standards. A curriculum introduction is online here. The program includes a culminating "STEM Bicycle Club Celebration" event hosted at the University of Cincinnati. 12 clubs ran 2016-2017.

Application Timeline

Milestone	Date
Applications announced and application window opens	July 29, 2017
Applications due	September 18, 2017
Announce club selections	November 15, 2017

Key Club Dates

Event	Who Attends	3d printers club	GCSC stem bicycle club
Professional Development (PD) and Training	Club Teacher and Project Manager	December 6, 2017 9:00am-3:00pm	January 17, 2018 9:00am – 3:00pm
Project Debrief	Club Teacher and Project Manager	April 18, 2018 11:00am – 1:00pm	May 2, 2018 11:00am – 1:00pm
Club Culmination / Field Trip, including campus tour	Students, families, club leaders and partners	April 26, 2018 9:30am-2:30pm (Showcase)	May 19, 2018 9:30am – 3:00pm (Celebration)

All events will be hosted at the UC's College of Education, Criminal Justice, and Human Services

Submitting Your Club's Application

Use this link to submit your club applications:

1. STEM Bicycle Club
2. 3d Printers Club

Once you're on the application site:

1. Make an account or sign in.
2. Begin filling out your information.
3. If you want to save a draft, scroll to the bottom of the application and click the "Save Draft" button. Access draft by logging into submittable.com, clicking the drop-down menu on the top right by your name, clicking "My Submissions," selecting "Saved Drafts" from the top bar, then clicking "Continue."
4. When your application is complete, click the orange Submit button. You will receive an email confirming your application has been received.

Questions? Contact GCSC

Club partners should contact GCSC at gcscstemed@gmail.com if more information is needed.

Club Selection Principles

1. **Inclusion & Access:** Any school, school partner, or other STEM collaborator in the greater Cincinnati region may apply. GCSC will award new clubs broadly across the region, while meeting other principles.
2. **Readiness & Commitment:** Club leaders (teachers, project manager) and their sponsors (principal and / or community organization) must be committed to:
   - Invest the time necessary to ensure success for students, teachers, coaches, families, and schools
   - Collaborate with GCSC to collect the data necessary to evaluate club impacts
   - Ensure student commitment
3. **Sustainability:** **GCSC prioritizes funding clubs that will co-invest to cover at least a small portion of their club costs.** In previous years clubs have accessed Title I or Title IV Block grant, 21st Century, PTO / PTA, school foundation, etc. funds to support their clubs. GCSC will help with partners' fund-raising as wanted (coaching / consultation, provide information needed for grant writing, and /or letters of endorsement).
4. **Sponsor Priority:** Clubs will be awarded in line with sponsors' priorities: location, school / student diversity, service to diverse and disadvantaged students, etc.

Resources Provided By GCSC

1. Curriculum that includes lesson plans and student workbooks.
2. Resources to learn how to use 3D printers and modeling software (3d Printers Club) and how-to videos (STEM Bicycle Club).
3. Online resources to support club planning, volunteer recruiting and orientation, student recruitment, family engagement, and more.
4. Professional Development (PD) / training and consultation for project leaders (teacher and project planning partner).

5. Club materials (bicycle and tools, 3d printers and materials, etc.). Purchases and delivery are coordinated by GCSC.
6. Culminating events hosted at the University of Cincinnati, including campus tours, for club students and their families, volunteers, club leaders and other club supporters.
7. As needed a small budget for club food, teacher stipend, and transportation to culmination event / field trip.

Club Roles and Responsibilities

1. **Project Manager:** Plans the club, including logistics and resources. Is the primary communication interface between the school, parents, community partners, volunteers, and GCSC. Key partner with the teacher to plan space and food, recruit students and obtain family permissions, administer pre- and post-club student surveys, arrange transportation to culmination event, etc. GCSC has seen many types of people successfully provide project manager leadership, including: resource coordinators, school counselors, after-school coordinators, instructional coaches, teachers, and community volunteers.
2. **Teacher:** Prepares and leads club meetings, using provided curricular resources. Creates tie-ins to science and math curriculum taught during the school day. Ideally, is a K-12 math, science or other STEM teacher.
3. **Volunteer Coaches:** Engage directly with students during club meetings. Build relationships with students and support them during club work time. Create and nurture opportunities to spark and support student interest in STEM learning and careers. Ideally:
   - There is at least 1 coach per 2 students in every club meeting
   - At least some of volunteers are STEM professionals (engineers, scientists, programmers / software developers, graphic designers, bankers, financial / insurance experts, etc.)
   - At least one volunteer is a 3d printing / graphic design / bicycle expert or enthusiast

High-Level Action Plan for STEM Bicycle and 3d Printers Clubs

1. Determine club leaders (project manager, teacher) and set club schedule.
2. Decide club meeting location / work space.
3. Identify community partners and recruit volunteer coaches.
4. Attend club training / Professional Development.
5. Plan food.
6. Plan how and where club materials will be stored between club meetings.
7. Select students. Collect permission forms and media releases.
8. Plan parent engagement.
9. Plan for club visitors, including media.
10. Run club, including:
    - Administer online surveys regarding student persistence and attitudes toward STEM.
    - Regularly post club news and pictures on social media.
11. Attend project debrief with other clubs' leaders.
12. Attend club culmination / field trip with students and their families, volunteers, and other club partners.

Ideas and Suggestions for Student Selection

1. Offer club membership to many students. Encourage all interested students to apply.
2. Set a strong expectation that selected students will make club a priority. This can be done as part of the application process. For example, to be considered for the club students could be required to:
   - Write a short essay explaining why they want to be in the club
   - Complete a questionnaire that explains their interest and commitment to attend at least 80% of club meetings
   - Complete a fun quiz "how much do you know about 3d printing / bicycles"
   - etc.
3. Involve teachers, counselors, and the school principal in student selection.
4. Create a diverse club. Bring together a mix of students to maximize their learning experience (gender, ethnicity and background, leadership skills, academic performance and potential, etc.)
5. Confirm parents / families will support their students' participation.
6. Confirm that each student has a safe and reliable way to get home following each week's club.

Ideas and Suggestions for Work Spaces

The 3d Printers Club will work well in any classroom since it depends only on tables and chairs for the printers and students' work space. Many 3d Printers Clubs meet in computer / technology centers, school libraries, or STEM/STEAM labs.

GCSC has seen variety of spaces work well for the STEM Bicycle Club, which requires sufficient space for 15 bicycles and students, bicycle stands, and volunteer coaches. Spaces used previously include cafeterias, auditorium stages, hallways, workshops, and former storage areas cleared for the club. The pictures below show some of the spaces used in previous STEM Bicycle Clubs.