

QCMP Math & Science Program

Program Mission: The mission of the QCMP Math and Science Program is to provide an opportunity for 11th grade students to discover, explore and experience the realm of science and mathematics in a nurturing environment with the goal of preparing students to enter Science, Technology, Engineering, and Mathematics(S.T.E.M.) careers.

Areas of Program Enrichment: The QCMP Math and Science will focus on the areas of Computer Science, Engineering, Science(Health), and Mathematics.

Computer Science – Spring 2011

Engineering – Summer 2011

Health Sciences – Fall 2011

Mathematics – Spring 2012

Criteria for Program Selection: For consideration, students meet the following requirements following is required for participation in the QCMP Math and Science Program:

- African American and Hispanic students with a 3.0 average or above
- A strong interest or commitment to the areas of Science, Technology, Engineering, and Mathematics
- Resource Management
- Demonstrated Leadership
- Self motivator
- Works well in a team setting

Five students should be selected from each of the following schools:

Iowa: Central, North, & West

Illinois: Moline, Rock Island, & UTHS

Learning Outcomes: Through participation in the QCMP Math and Science Program students will enhance skills in Computer Science, Engineering, Health Sciences, and Mathematics while developing teamwork, resource management and leadership with the assistance of instructors, support staff who will also serve as mentors for future endeavors.

Computers are magnificent tools for the realization of our dreams, but no machine can replace the human spark, spirit, compassion, love, and understanding – Louis Gerstner

Program Title: Computer Science – Hardware and Networking

Program Date: Spring 2011

Program Location: TBD

Instructors: *Hardware - TBD*

Networking - TBD

Instructional Methods: This Math & Science program is taught using a variety of instructional including lecture, class discussions, small group work, project creation, and practical application.

Textbook & Materials: TBD

Schedule:

9:00 am – 9:15 am	Welcome
9:30 am – 10:45 am	Session I – Building a Computer Session II – Networking
11:00 am – 12:15 pm	Session I – Networking Session II – Building a Computer
12:30 pm – 1:00 pm	Lunch
1:15 pm – 2:30 pm	Practical Application
2:30 pm – 3:00 pm	Closing Remarks & Evaluation

Areas of Concentration in Computer Science:

Building a Computer

- I. Why Build a Computer?
- II. Types of Computer Parts
 - A. Computer Cases
 - B. Power Supplies
 - C. Motherboard
 - D. Operating System
 - E. Hard Drive
 - F. Memory
 - G. Cards – Sound & Video
 - H. Other Parts
- III. Assembling
- IV. Testing
- V. Troubleshooting

Networking: The action of connecting or linking two or more computing devices such as laptops, desktops, printers, gaming systems for the purpose of sharing information.

- I. Types of Computer Networks
 - A. Area Networks
 - B. Network Topologies
 - C. Packet Switching
 - D. Network Protocols
- II. Types of Network Equipment
 - A. Network Router
 - B. Hubs
 - C. Switches
 - D. Adapters
 - E. Modems
 - F. Cables
 - G. Other Hardware
- III. Ethernet
 - A. Ethernet Cards
 - B. Cables
- IV. Wireless Networks
 - A. Types of Wireless Networks
 - B. Wireless Hotspots
 - C. Strengths

- D. Limitations
- E. Bluetooth
- V. Protecting a Network
 - A. Protocols
 - B. WAP
 - C. WEP
 - D. User Name & Passwords

Practical Application: Each group will be assigned the task of assembling a computer from available parts and establishing a network of two computers within time allotted.

Alternatives:

3D Animation: *Design, model, and animate 3D environments which can be imported into games or animation.*

Web Design: *Create your own website from scratch using HTML, Dreamweaver, or Word.*

Programming Logic: *Write a program using multiplatform Java language. Learn the fundamentals of computer programming and create fun programs.*