BuildIT

Girls Building Information Technology Fluency Through Design

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QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Introductions

- Name
- Position
- Organization
- Your goals for the workshop/what you expect to learn

Workshop Goals

Provide you with an

- introduction to Build IT: Overview and hands-on experience
- introduction to the Design Process and how to use it
- information on next steps for Build IT in the Girls Inc. affiliate network

Girls & Technology

While women constitute 46% of the U.S. workforce, they make up only 27% of workers in the areas of computer science, engineering, and other mathematical fields such as physics.

— U.S. Department of Labor, 2006

Computer science instruction that emphasizes the 'web' of associations between programming, design, and other areas of the curriculum would help to attract a more diverse group of learners, and would advance computer fluency for all students.

— *Tech-Savvy*, AAUW, Commission on Technology, Gender, and Teacher Education, 2000.

Build IT's Mission

Develop a problem- and design-based curriculum that promotes middle school girls' information technology (IT) fluency and incorporates the STEM content of computer science and mathematics.

Build IT's Goals

Motivate middle school girls to

- Use technology to strengthen and build their technology fluency
- Take high school algebra and geometry courses in preparation for postsecondary STEM education and IT careers
- Explore IT and pursue IT careers

Enhance staff capacity to offer IT fluency programming

Strategies for Achieving Goals

- Problem-based curriculum that uses the *Understanding by Design* approach
- Embedded performance tasks for evaluating technology fluency
- Family Tech Nights
- Professional development materials for staff
- Guides for involving IT professionals
- Evaluation instruments for measuring girls' interests and understandings

Build IT

Understanding by Design

1. **What do we want girls to learn? (Enduring understandings)**
   - Being Fluent with Information Technology (NRC)
   - Secretary's Commission on Necessary Skills (SCANS)
   - National Council of Teachers of Mathematics (NCTM)
   - A Model Curriculum for K-12 Computer Science (ACM)
2. **What evidence will show that they've learned it?**
   - Embedded performance tasks
   - Family Tech Night presentations
   - Interviews & observations
   - IT Attitudes Survey
   - IT Concepts Survey
3. **Then develop the activities**

Build IT

Enduring Understandings

	Computer Science Content
Design	Design is a process with specific stages and elements: brainstorming, planning, gathering user data, scenario development, storyboarding, requirements and documentation, prototyping, user testing, and revising (NRC). An initial solution is often revised or improved by iteration, which often causes a refinement in the definition of the problem (NRC, SCANS). Testing entails determining whether a proposed solution meets design goals (and whether the design addresses the problem) and works under diverse conditions, taking into account that most systems will be used in ways that were not intended, as well as in expected ways (NRC, SCANS).
Computers	All computers are programmed, meaning they follow a sequence of basic steps (NRC). Computers, in a variety of sizes, can be used independent of networks and as part of networks (NRC, SCANS).
Systems and Networks	Information systems include a variety of human and technology components that can be mapped and analyzed to troubleshoot problems and improve the system (NRC, SCANS). Networks have physical and logical structures that allow information to be routed between computers. These structures have an impact on the flow (e.g., bandwidth) of information that can affect a user's experience (NRC, SCANS).
Trouble-shooting	Technology analogies exist and can help one to become adept at using new technologies and to troubleshoot (NRC). To troubleshoot a problem in an information technology system, application, or operation, it is essential to have some expectation of what the proper behavior should be and how it might fail to be realized (NRC).
Collaboration & Leadership	Collaboration involves a strategy for dividing tasks associated with a solution into pieces that can be worked on individually and reassembling the work products into a cohesive whole to form the solution (NRC, SCANS). Leadership involves teaching others new skills, communicating ideas to justify a position and convince others, and supporting a vision that may challenge the status quo (SCANS).

Handouts

- Introduction to Build IT materials, includes enduring understandings and example lessons
- Build IT successes
- Units 1 through 6

Introduction to design
Unit 1

Sharing designs of their flying objects
Unit 1

Brainstorming with an IT Professional
Unit 1

Build IT

Designing the Perfect Hangout
Unit 1

Build

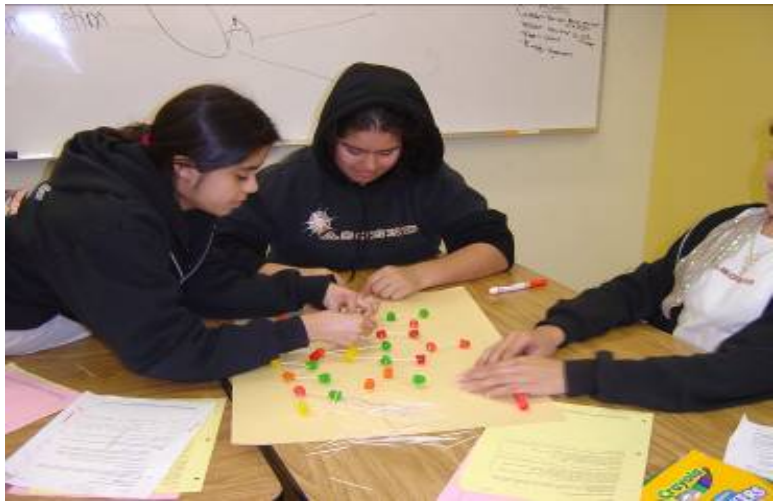
Learning how the internet works
Unit 2

Build IT

Designing Blogs
Unit 2

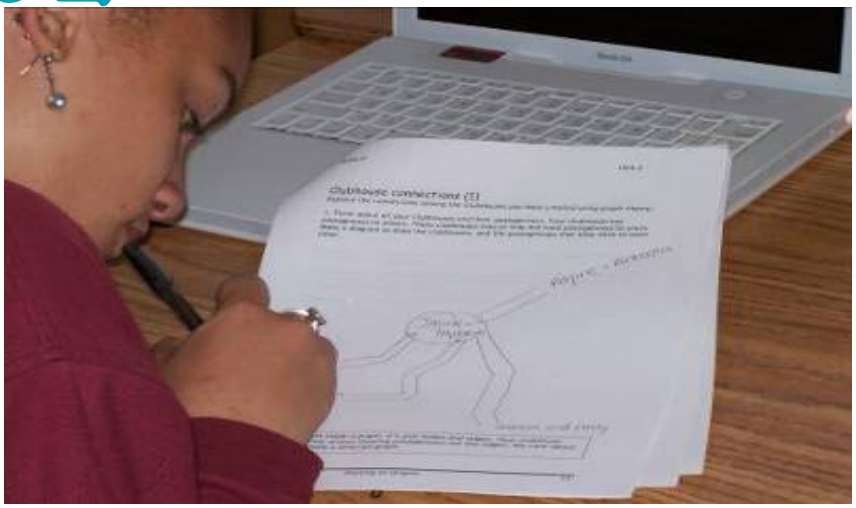
Build IT

Learning about Algorithms
Unit 2



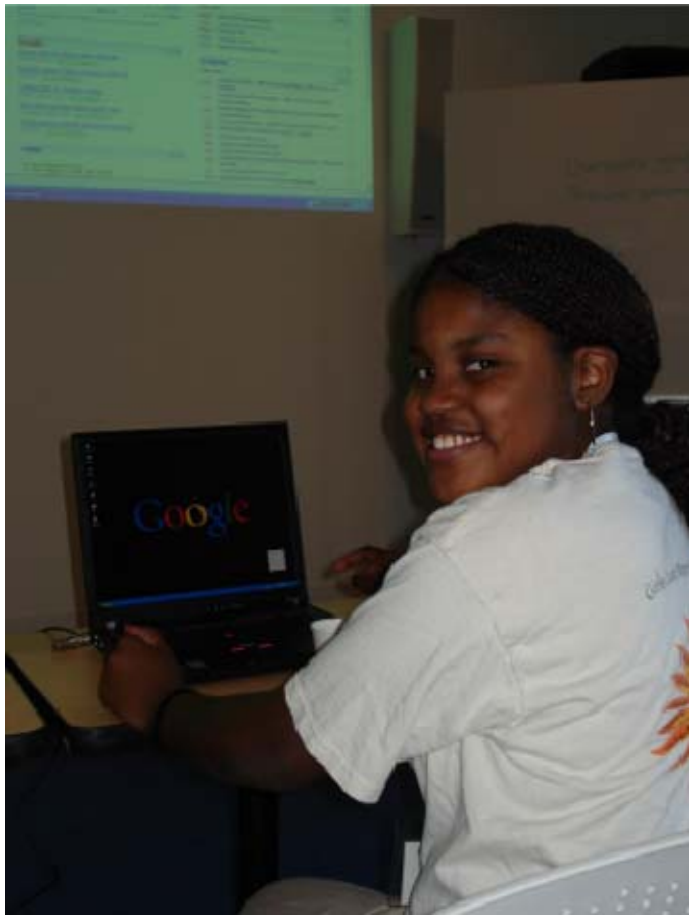
Build IT

Designing Clubhouses
Unit 2



Build IT

Designing Websites
Units 3 & 6



Build IT

Exploring communication tools
Unit 4

Build IT

Game Design
Unit 5

Build IT

Presenting work during Family Tech Night

Build IT

All STARS

- Sports
- Technology
- Academic Achievement
- Responsibility
- Sisterhood
- 2 Program Leaders & 1 Program Coordinator
- 4-5 times a week
- Serve girls in Oakland & San Leandro
- Each school site serves 32 girls

Build IT

All STARS Program Schedule

	Monday		Thursday	
3:15 - 3:30	Check-In		Check-In	
3:30 - 4:45	Group A **Build IT**	Group B Sports	Group A SSB	Group B **Build IT**
4:45 - 5:30	Homework		Homework	
5:30 - 5:45	Check-Out		Check-Out	

	Tuesday		Wednesday	
2:30-2:45	Check-In		Check-In	
2:45-4:00	Group A Sports	Group B **Build IT**	Group A **Build IT**	Group B SSB
4:00-4:45	Group A Girl Space	Group B Sports	Group A Sports	Group B Girl Space
4:45 - 5:30	Homework		Homework	
5:30 - 5:45	Check-Out		Check-Out	

Build IT

Tech Equipment

- 1 computer for every 2 girls
- 1 LCD projector
- Secure storage
- Wireless router/ internet access
- Software
- IT Support
- Handhelds (Unit 4 only)

Build IT

Build IT & Girls Inc. Affiliates

- The Noyce Foundation is funding the pilot scaling of Build IT at 4 affiliates.
- Professional development and implementation will begin January 2008.
- Contact Brenda Stegall at Girls Inc. for details. Meeting after the workshop.

Hands-□On Activities

- 2:40 to 3:10 Design Process activity
- 3:10 to 4:10 Blog activity
- 4:10 to 4:50 Discussion groups
  - Direct service with Odette
  - Program resources/affiliate capacity with Melissa
- Check Out

Thank You!

- Melissa Koch, Principal Investigator

SRI's Center for Technology in Learning

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