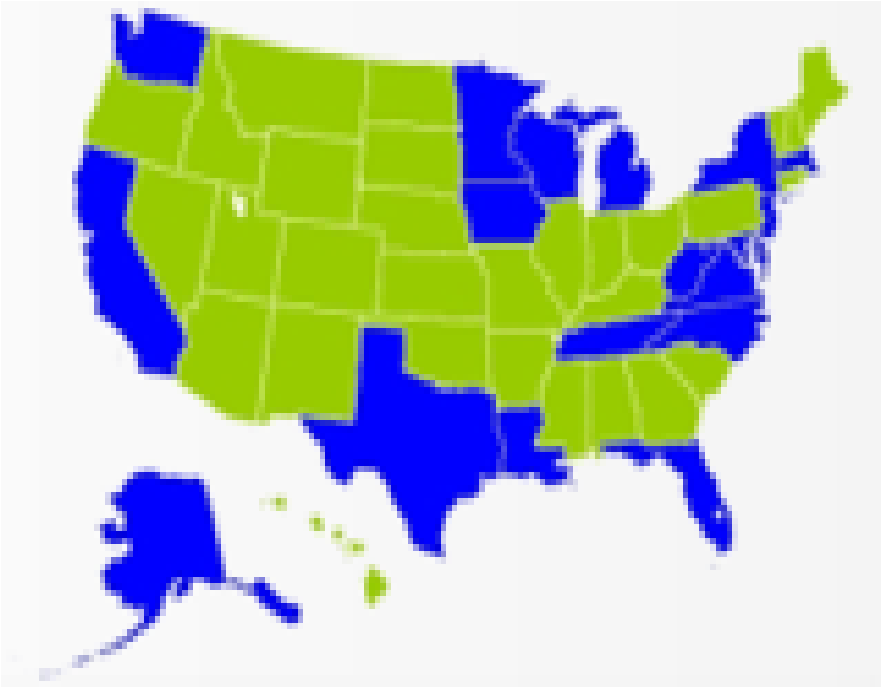
CyberWatch Overview

http://cyberwatchcenter.org/

Sponsored by the National Science Foundation

CyberWatch: An Advanced Technological Education (ATE) Center

- National Science Foundation
- Several supplemental grants
- Consortium members in multiple states + DC:
  - Community Colleges
  - Universities
- Numerous Agency/Industry/Federal partners



CyberWatch Mission and Goals

Mission: To improve the quality and quantity of the information assurance workforce

Goals:

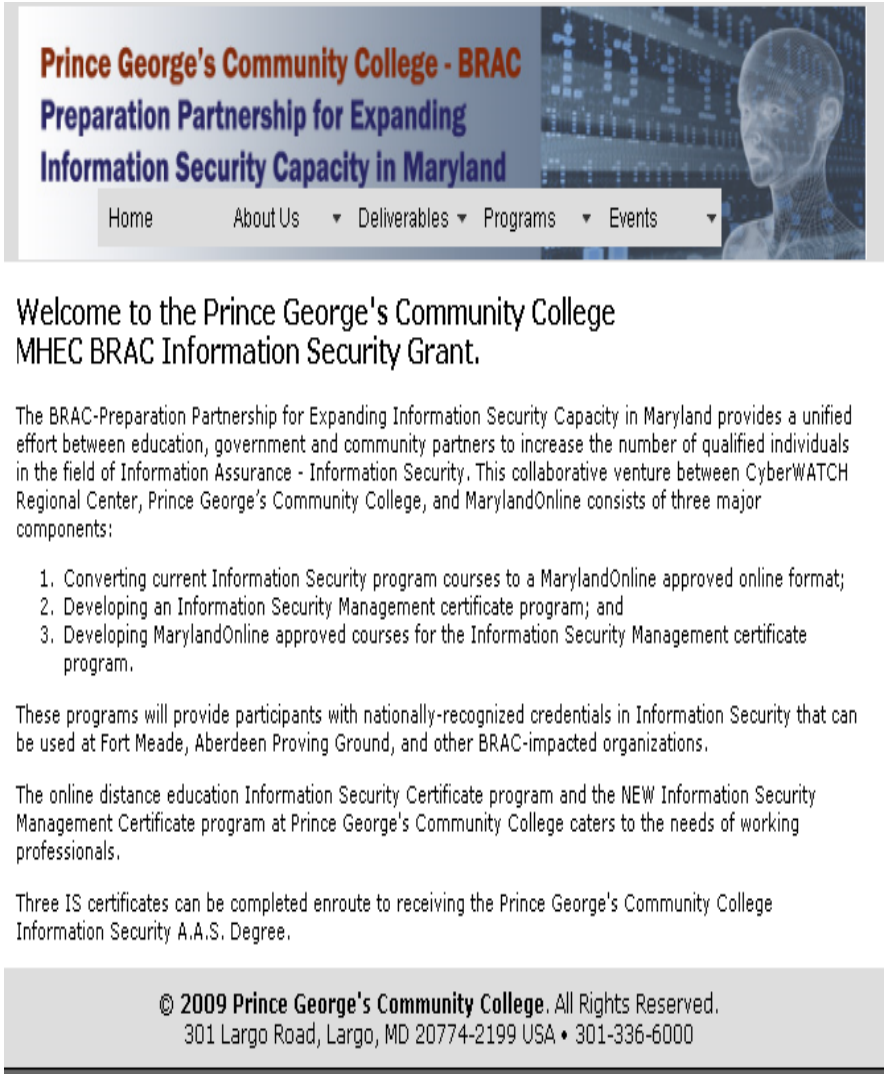
- Curriculum Development
- Faculty Development
- Student Development
- K-12 Pipeline
- Dissemination and Outreach

Curriculum Development

- Virtual Lab – Montgomery College
- Digital Forensics Lab – University of Maryland
- CyberWatch Underground – Bowie State University

Online Access

- Virtual Lab, VMware, other virtual machines
- Online course modules
- Course sharing based on the MarylandOnline Quality Matters model
- Adoption of the Quality Matters rubric and regimen

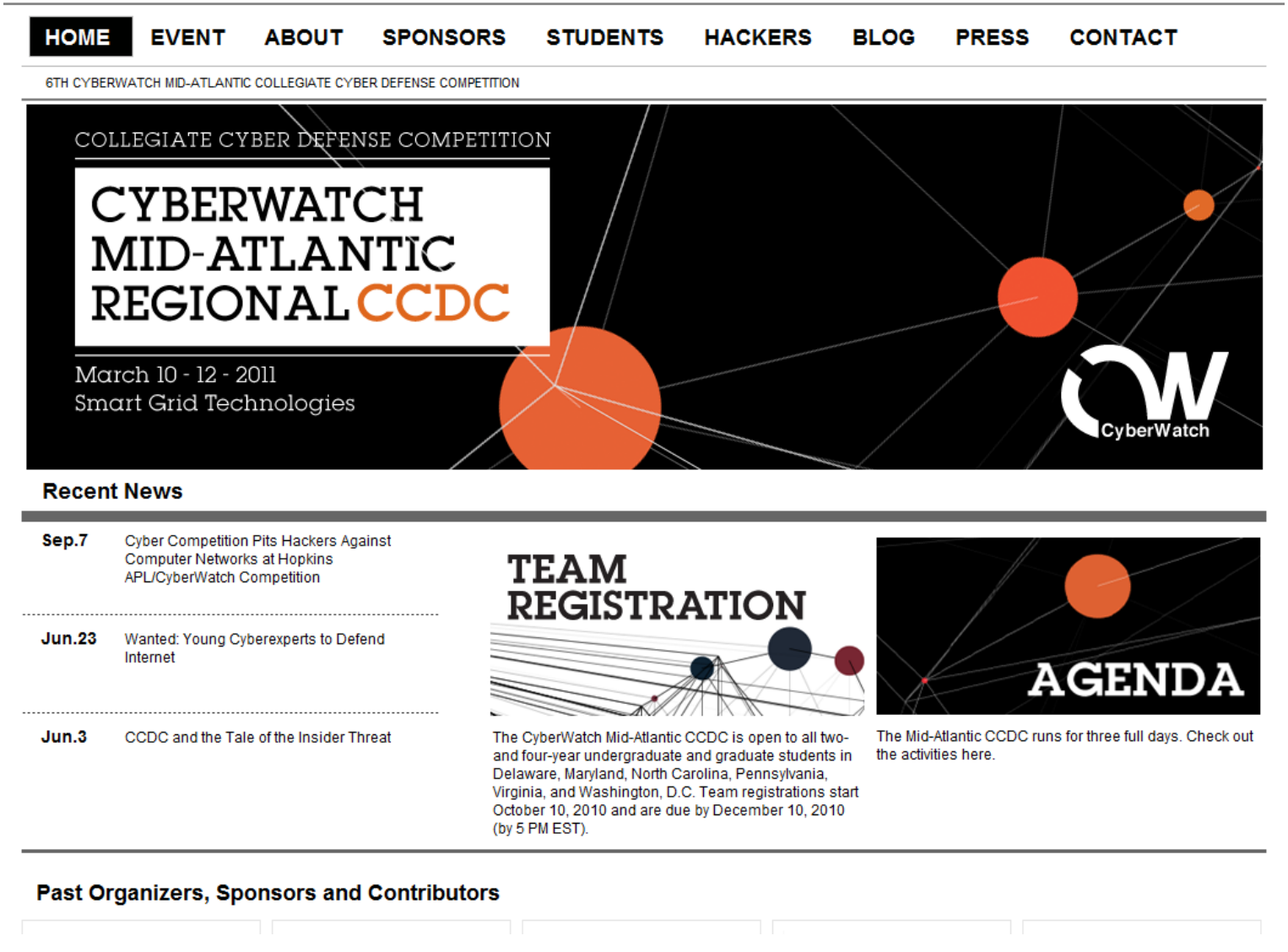


Faculty Development

- Workshops/Institutes /Conferences, e.g.:
  - Certified Ethical Hacking
  - FTK/EnCase
  - Wireshark
  - Secure Programming
  - CISSP Training
- Island in Second Life for faculty training
- Faculty Graduate Program

Student Development

- Internships, Scholarships, Career Placements
- Student Competitions:
  - Mid-Atlantic Regional Collegiate Cyber Defense Competition (CCDC)
  - Digital Forensics Cup
  - Security Awareness Contest- IHE & K12
  - CSSIA's High School Network Security Competition
  - DC3 Digital Forensics Challenge
  - US Cyber Challenges
  - CyberPatriot


HOME
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6TH CYBERWATCH MID-ATLANTIC COLLEGIATE CYBER DEFENSE COMPETITION
COLLEGIATE CYBER DEFENSE COMPETITION
CYBERWATCH MID-ATLANTIC REGIONAL CCDC
March 10 - 12 - 2011
Smart Grid Technologies
CyberWatch
Recent News
Sep.7
Cyber Competition Pits Hackers Against Computer Networks at Hopkins APL/CyberWatch Competition
Jun.23
Wanted: Young Cyberexperts to Defend Internet
Jun.3
CCDC and the Tale of the Insider Threat
TEAM REGISTRATION
The CyberWatch Mid-Atlantic CCDC is open to all two- and four-year undergraduate and graduate students in Delaware, Maryland, North Carolina, Pennsylvania, Virginia, and Washington, D.C. Team registrations start October 10, 2010 and are due by December 10, 2010 (by 5 PM EST).
AGENDA
The Mid-Atlantic CCDC runs for three full days. Check out the activities here.
Past Organizers, Sponsors and Contributors

Security Awareness Contest

CyberWatch K-12 Division

Director/PI

Davina Pruitt-Mentle, PhD

Sponsored by the National Science Foundation

Expanding Knowledge in Cyberawareness and Careers in Cybersecurity

SUMMER CYBERWARRIOR PROGRAMS

Computational Logic




Field Trips

● Cryptography ● Digital Forensics ● System Vulnerabilities ● C3 Speakers ●

1 2 3 4 5 6 7 ⏸

WHAT'S NEW

- MD High School Network Security Competition - May 10, 2011
- Mid-Atlantic CCDC High School Activities
- MD US Cyber Camps: July 11-15/July 18-22
- MD Instructor US Cyber Training: July 11-15
- 2011 CW Summer Cyber Camps
- VMWare & CCNA Training

PROGRAMS

We have a wide range of programs, content and activities for formal and informal settings. The central focus is Cybersecurity content, but it is supported by the too often neglected topics of citizen awareness of ethics, safety and security. More

WORKFORCE AWARENESS

What is CyberSecurity ? What is Information Assurance? What career options are there in CyberSecurity and what pathways are there? More

C3 AWARENESS

We inform the educational community about Cyberethical, Cybersafety and CyberSecurity (C3) implications of technology use and illustrate how students, educators and parents can apply these concepts to their own setting.

More

K12 IT SYSTEMS

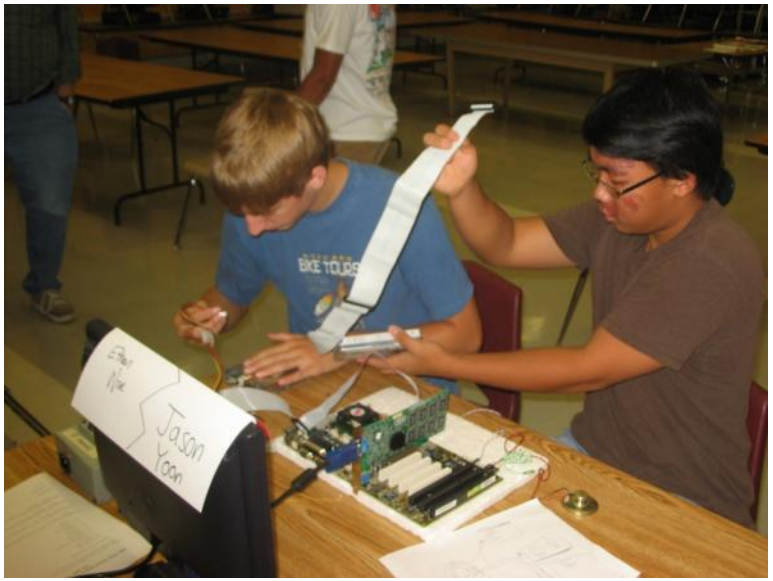
Workshops are conducted at partner institutions on a variety of topics determined by our annual needs assessment survey. More

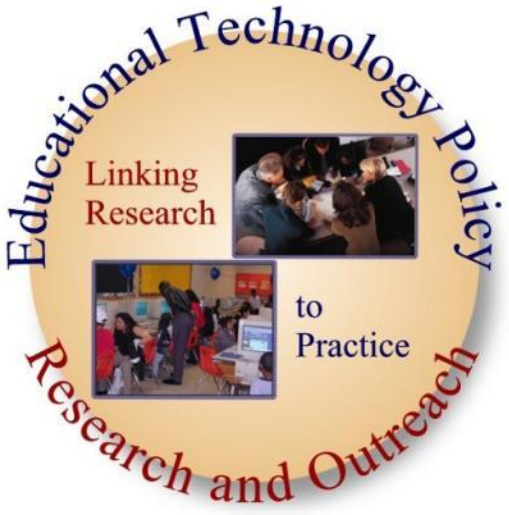
K-12 Programs

- K-12 Division Goals include increasing:
  - The IA workforce pipeline
  - Community awareness of IA workforce
  - Community awareness of C3-Cyberethics, Safety and Security, and
  - Security of K-12 IT systems

K–12 Pipeline

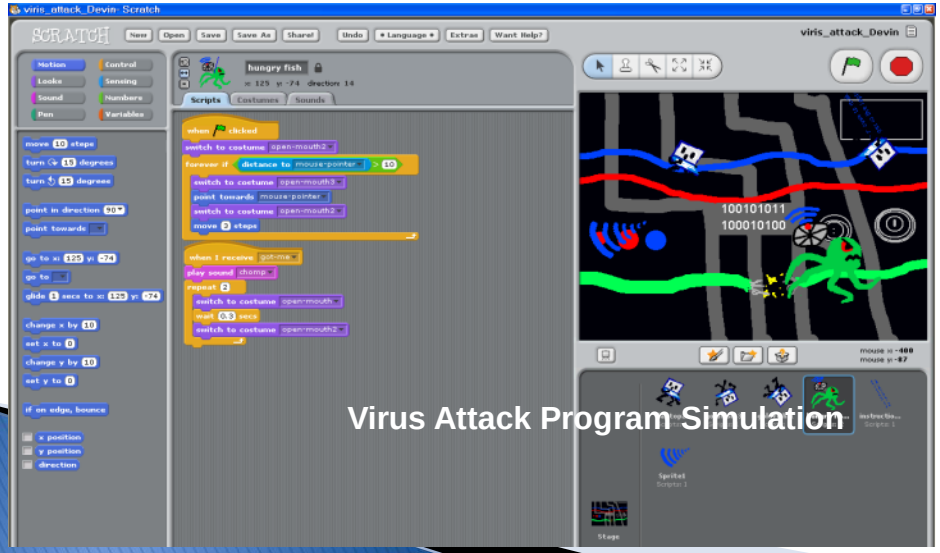
- Annual Guidance Counselors Workshop
- Annual Cyberethics, Cybersafety and Cybersecurity (C3) Conference
- Annual Cool Careers in Cybersecurity for Girls Summit
- Programs
  - SECURE IT Programs
  - Summer CW Cyber Camps
  - US Cyber Challenge Camps
    - Instructor Camp
    - CTE Programs
- Competitions
  - HS Network Security Competition
  - US Cyber Foundations/Quest
  - US Cyber Patriots
  - DC3





K-12 Program

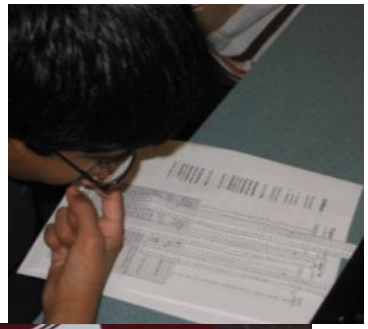
- Informal after/before school programs
  - Mindtools (4-5)
  - JR. CyberwarriorProgram (6-8)
  - Extension units
- Summer Cyberwarrior high school programs



Virus Attack Program Simulation

Formal Lesson Plans
High School Clubs
4H
Girl Scouts

CW K12 Modules



5 Content Modules

- *Computational Logic/Programming—Scripting*
- *Cryptography*
- *Digital Ethics, Safety and Security*
- *System Vulnerabilities*
- *Digital Forensics*

- Grade bands 4-5, 6-8 and 9-12
- Tied to national and state standards and partnering school system math, science & technology curriculum, students engage in hands-on STEM activities and improve digital literacy skills while learning and applying concepts through gaming, modeling and simulation development.
- Speakers and field trips
- The central focus is the field of IA, but supported by the too often neglected topics of citizen awareness of Cyberethics, safety and security.

Programming	Cryptography	Digital Ethics, Safety and Security	System Vulnerabilities	Digital Forensics
Elementary School				
Intro to LOGO - Microworlds Interactive PPT Scratch Robotics I - RoboLab	Intro to cryptology & cryptanalysis Transposition cipher Invisible ink Substitution cipher (cipher wheels) NSA Codemakers Codebreakers	Password/passphrases Cyberbullying Who's Who Online Digital Footprints	Free iPod-Opening Attachments Pop Ups Password Guessing	Decoding/Debugging I/II MW programming Learning Binary Name in Computer "Talk"-Binary Numbers Bar coding Real or Unreal (Detecting scams)
Middle School				
Computational Logic MicroWorlds/Scratch Robotics II -Mindstorms Google SketchUp NetLogo Alice	Intro to cryptology & cryptanalysis Coding/decoding -out of the box Substitution cipher and letter/number frequency Cryptography Scavenger Hunt Geometric cipher	Passwords/Passphrases /cyberbullying Online Reputation Management Dangerous Uploads Security Clearances Copyright/Plagiarism Social Networks	System Upkeeps/Patching Phishing/Pharming/ Hijacking Password Cracking SNS Malware	Recognition of similar patterns Needle in a Hay Stack (where's the bad code)
High School				
Computational Logic II Raptor MicroWorlds/Scratch Python Programming in Excel StarLogo/NetLogo Robotics III Mindstorms Alice	Intro to cryptology & cryptanalysis Substation ciphers Paper Enigma Algebraic ciphers Intro Computer cryptography 2 key cryptography	Passphrases/patterns-encryption Cyberbullying Sexting Online Reputation Management Copyright/Plagiarism Security Clearances File Sharing/LimeWire Social Networks	Security Layering Firewalls Password Cracking II Reconnaissance Wireshark Pasco Patterns SNS Malware II Identity Theft	Deleted/Hidden Files SIM reader exercise Roadrunner exercise SamSpade exercise FTK Image Lite EnCase (CWDFL) Reverse Engineering Steganography

CW K12 Content

Content Examples

Write your name in Computer Talk

The Alphabet in Binary Code

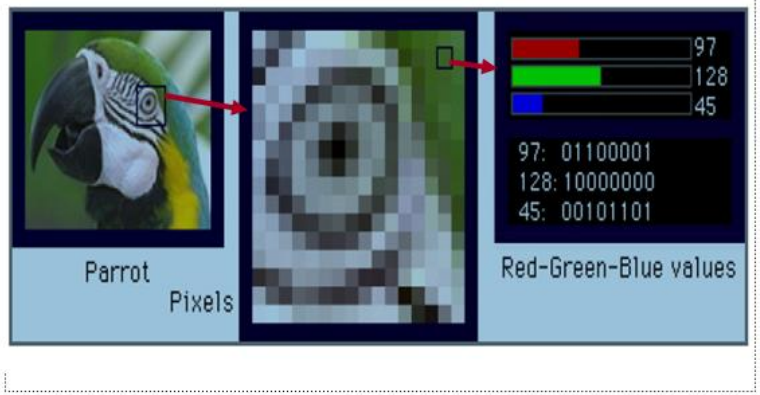
Letter	Binary Code	Letter	Binary Code
A	01000001	a	01100001
B	01000010	b	01100010
C	01000011	c	01100011
D	01000100	d	01100100
E	01000101	e	01100101
F	01000110	f	01100110
G	01000111	g	01100111
H	01001000	h	01101000
I	01001001	i	01101001
J	01001010	j	01101010
K	01001011	k	01101011
L	01001100	l	01101100
M	01001101	m	01101101
N	01001110	n	01101110
O	01001111	o	01101111
P	01010000	p	01110000
Q	01010001	q	01110001
R	01010010	r	01110010
S	01010011	s	01110011
T	01010100	t	01110100
U	01010101	u	01110101
V	01010110	v	01110110
W	01010111	w	01110111
X	01011000	x	01111000
Y	01011001	y	01111001
Z	01011010	z	01111010

Decoding Bar Codes

63938200039 3

- Add together the value of all of the digits in odd positions (digits 1, 3, 5, 7, 9 and 11).
  6 + 9 + 8 + 0 + 0 + 9 = 32
- Multiply that number by 3.
  32 * 3 = 96
- Add together the value of all of the digits in even positions (digits 2, 4, 6, 8 and 10).
  3 + 3 + 2 + 0 + 3 = 11
- Add this sum to the value in step 2.
  96 + 11 = 107
- Take the number in Step 4. To create the check digit, determine the number that, when added to the number in step 4, is a multiple of 10.
  107 + 3 = 110
- The check digit is therefore **3**.

Embedding Text in Pictures



http://www.roubaixinteractive.com/PlayGround/Binary_Conversion/Binary_to_Text.asp

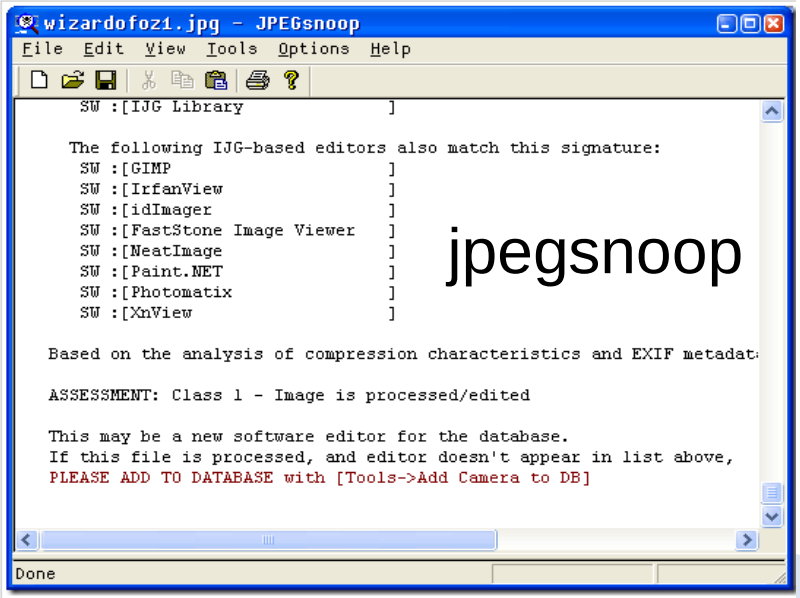
- Send me a polite or write me a polite coded binary message
- dpruitt@umd.edu
- http://www.roubaixinteractive.com/PlayGround/Binary_Conversion/Binary_to_Text.asp

Content Examples

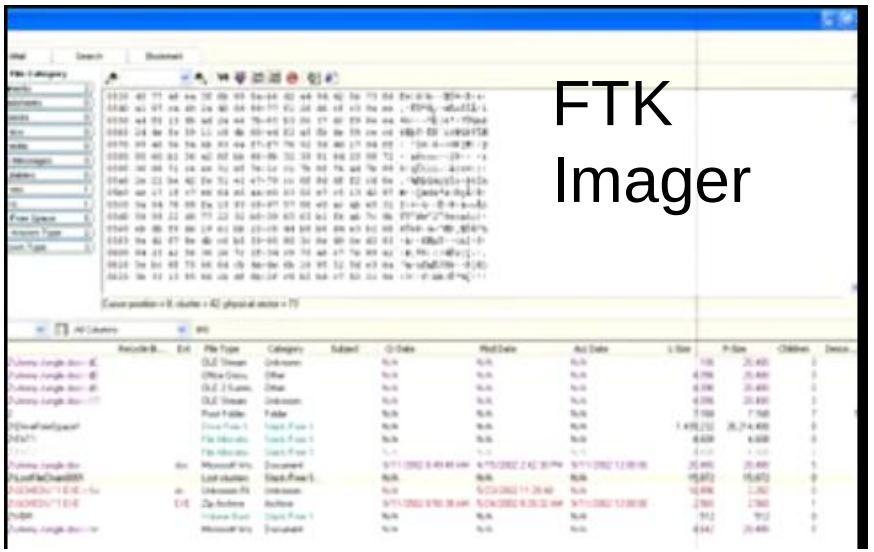
Can you tell the difference?

With your parents help

SOURCE: http://mozaiq.org/encrypt/ AND http://mozaiq.org/decrypt/



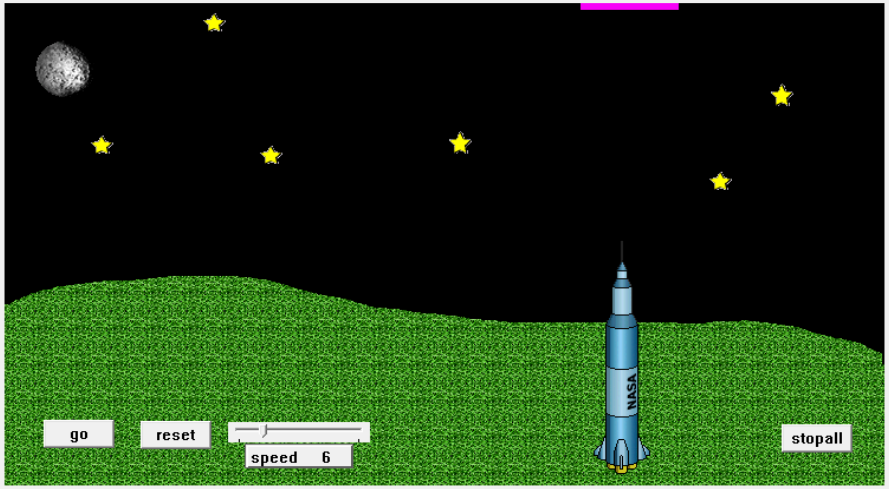
jpegsnoop



FTK Imager

Content Examples

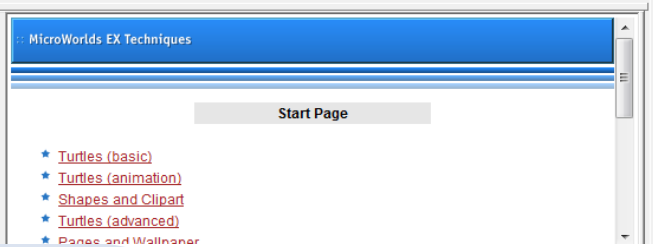
Algorithmic thinking via MicroWorlds



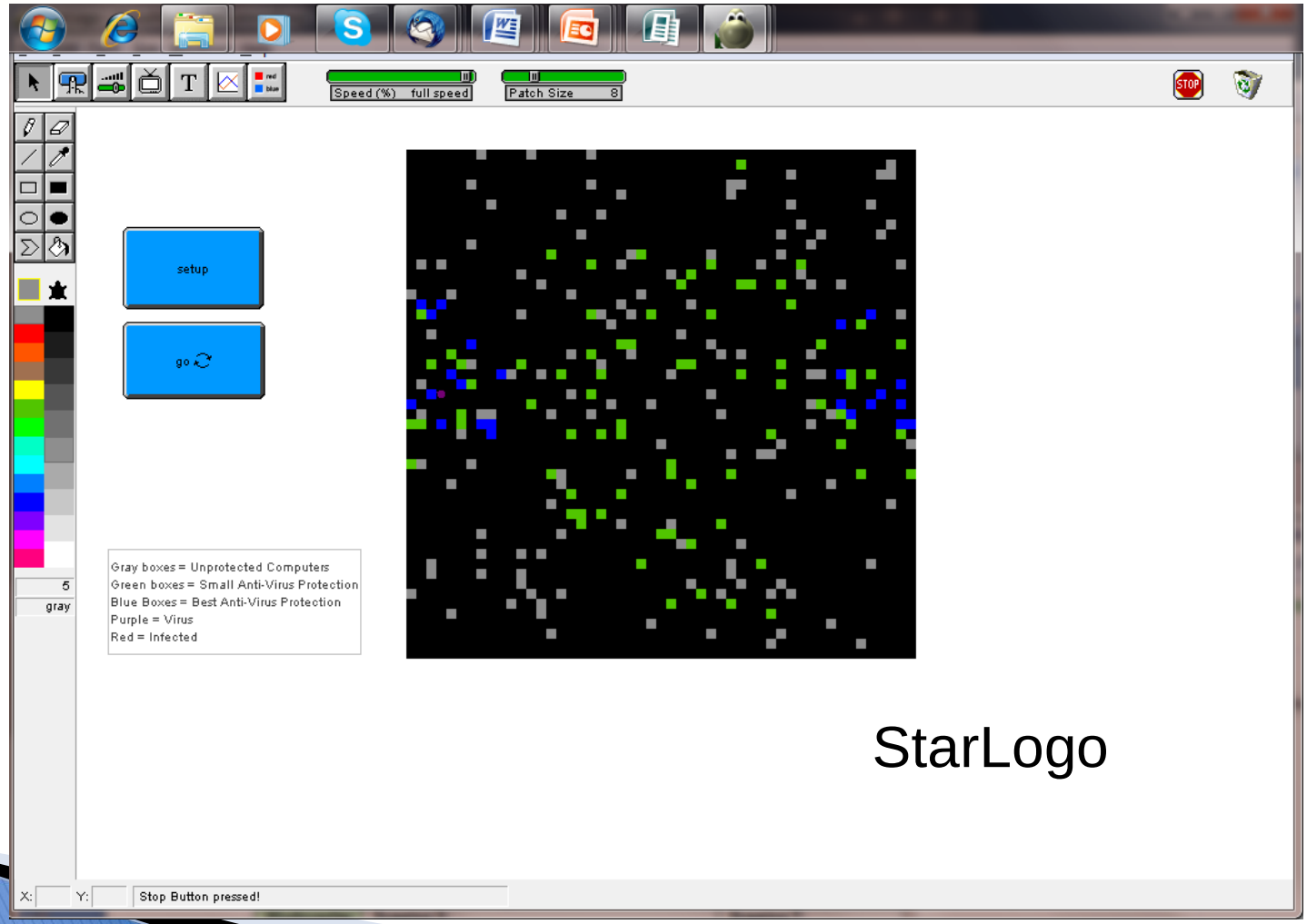

```
to go
everyone [clickon]
waituntil [touching? "moon "rocket]
announce [The rocket landed on the moon]
stopall
end

to reset
rocket, setpos [150 -100]
setsize 40
seth 0
moon, setpos [-321 155]
seth 90
end


to rocketsize
rocket,
if ycor < -50 [setsize 40 stop]
if ycor < -45 [setsize 39 stop]
if ycor < -40 [setsize 38 stop]
if ycor < -35 [setsize 37 stop]
if ycor < -30 [setsize 36 stop]
if ycor < -25 [setsize 35 stop]
if ycor < -20 [setsize 34 stop]
if ycor < -15 [setsize 33 stop]
if ycor < -10 [setsize 32 stop]
if ycor < -5 [setsize 31 stop]
if ycor < 0 [setsize 30 stop]
if ycor < 5 [setsize 29 stop]
if ycor < 10 [setsize 28 stop]
if ycor < 15 [setsize 27 stop]
if ycor < 20 [setsize 26 stop]
if ycor < 25 [setsize 25 stop]
if ycor < 30 [setsize 24 stop]
if ycor < 35 [setsize 23 stop]
if ycor < 40 [setsize 22 stop]
if ycor < 45 [setsize 21 stop]
if ycor < 50 [setsize 20 stop]
if ycor < 55 [setsize 19 stop]
if ycor < 60 [setsize 18 stop]
if ycor < 65 [setsize 17 stop]
if ycor < 70 [setsize 16 stop]
if ycor < 75 [setsize 15 stop]
if ycor < 80 [setsize 14 stop]
if ycor < 85 [setsize 13 stop]
if ycor < 95 [setsize 12 stop]
if ycor < 100 [setsize 11 stop]
setsize 10
end
```



Content Examples



StarLogo

Content Examples/Lessons

How to Tell if an E-mail is Real

Bank of United States

Dear Customer,

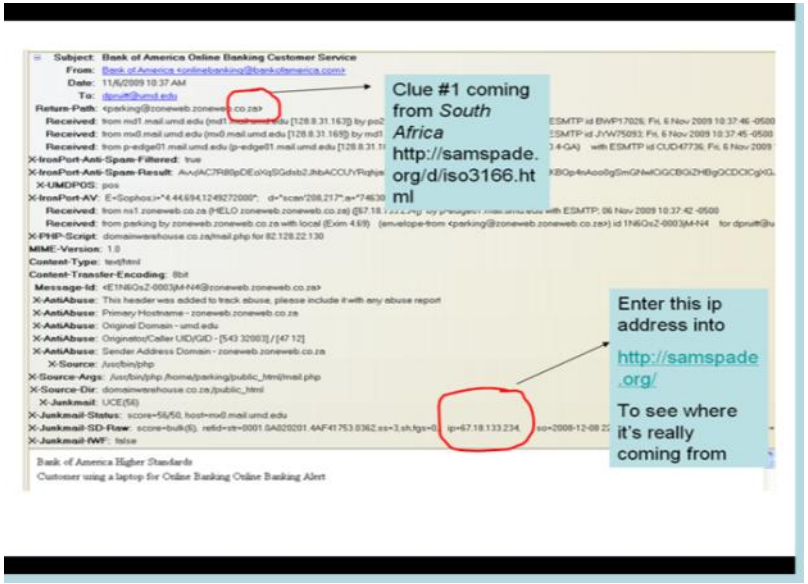
Unfortunately, your Online Access is locked Out.
To ensure your protection, we've now lock access to your accounts due to a miss-match of access code between your security details. You now need to verify your Identity. You won't be able to gain access to your accounts until you've done this.
To verify your Identity, kindly follow the reference below and go to the directions to instant activation. This should take about five minutes.

https://sitekey.blankoftheUSA.com/sas/@signonSetup.do

Fro more information on the Account Access Lock Out procedures please open the attached document.
Important Notice: You are strictly advised to match your Site-key Question and Answers correctly to avoid service denial.

As a token of our appreciation for promptly responding, we will send you an Apple iPod nano. You must respond within 1 hour of receiving this message to receive your Apple iPod nano

Yours Sincerely.
Bank Of America
Online Banking Customer Service



Don't be Lazy About Encryption

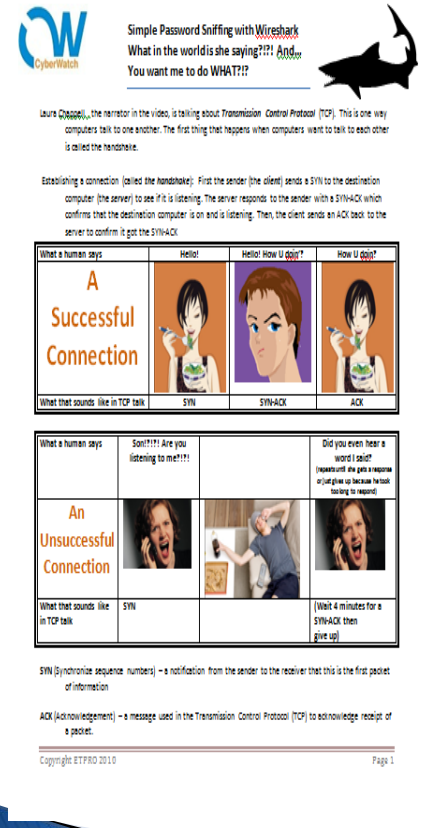
- Process may vary depending on the version of Windows on any given machine
- EX: Windows XP
  - Open Windows Explorer
  - Right-click the file or folder that you want to encrypt, and then click ***Properties***
  - On the General tab, click ***Advanced***
  - Check the box that says, "***Encrypt contents to secure data check"***

How long to crack

- Assume 1 million attempts a second

Digits	Lower case (26)	Lower case + number (36)	Upper – Lower-Numbers (62)
4	0.46 seconds	1.68 seconds	14.78 seconds
6	5.15 minutes	36.28 minutes	15.78 hours
8	58 hours	32.65 days	6.92 years

Wireshark



Simple Password Sniffing with Wireshark

What in the world is she saying?!?! And...

You want me to do WHAT?!?

Laura Chappell, the narrator in the video, is talking about *Transmission Control Protocol* (TCP). This is one way computers talk to one another. The first thing that happens when computers want to talk to each other is called the handshake.

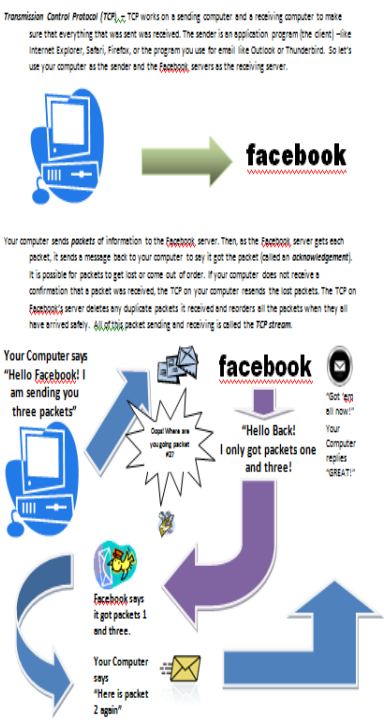
Establishing a connection (called the *handshake*): First the sender (the client) sends a SYN to the destination computer (the server) to see if it is listening. The server responds to the sender with a SYN-ACK which confirms that the destination computer is on and is listening. Then, the client sends an ACK back to the server to confirm it got the SYN-ACK

What a human says	Hello!	Hello! How U doin'?	How U doin?
A Successful Connection			
What that sounds like in TCP talk	SYN	SYN-ACK	ACK

What a human says	Son!?!?! Are you listening to me?!?!		Did you even hear a word I said? (repeats until she gets a response or just gives up because he took too long to respond)
An Unsuccessful Connection			
What that sounds like in TCP talk	SYN		(Wait 4 minutes for a SYN-ACK then give up)

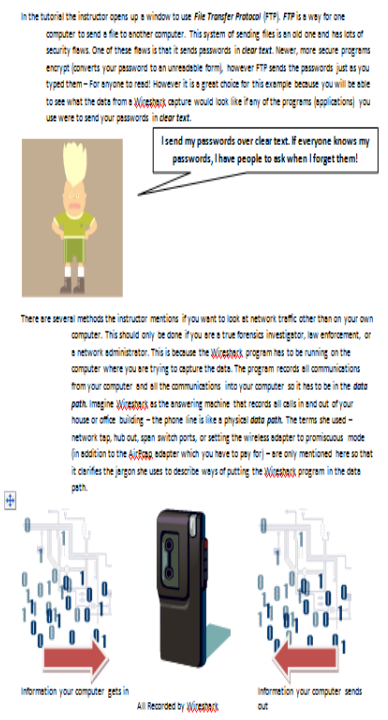
SYN (Synchronize sequence numbers) – a notification from the sender to the receiver that this is the first packet of information

ACK (Acknowledgement) – a message used in the Transmission Control Protocol (TCP) to acknowledge receipt of a packet.



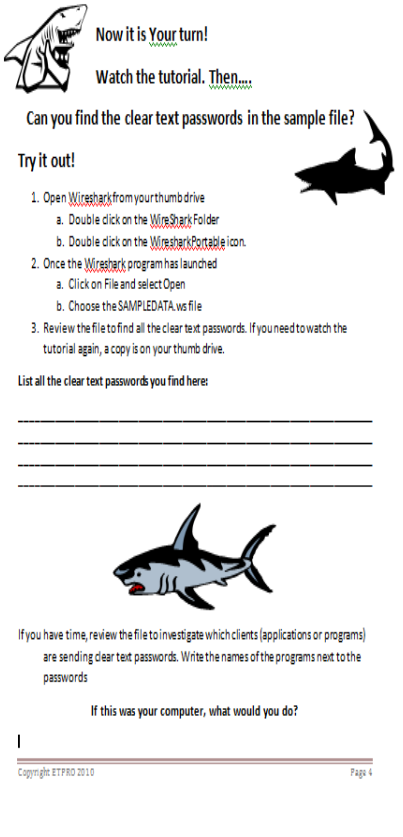
Transmission Control Protocol (TCP) – TCP works on a sending computer and a receiving computer to make sure that everything that was sent was received. The sender is an application program (the client) –like Internet Explorer, Safari, Firefox, or the program you use for email like Outlook or Thunderbird. So let's use your computer as the sender and the Facebook servers as the receiving server.

Your computer sends *packets* of information to the Facebook server. Then, as the Facebook server gets each packet, it sends a message back to your computer to say it got the packet (called an *acknowledgement*). It is possible for packets to get lost or come out of order. If your computer does not receive a confirmation that a packet was received, the TCP on your computer resends the lost packets. The TCP on Facebook's server deletes any duplicate packets it received and reorders all the packets when they all have arrived safely. All of this packet sending and receiving is called the *TCP stream*.



In the tutorial the instructor opens up a window to use *File Transfer Protocol (FTP)*. *FTP* is a way for one computer to send a file to another computer. This system of sending files is an old one and has lots of security flaws. One of these flaws is that it sends passwords in clear text. Newer, more secure programs encrypt (converts your password to an unreadable form), however FTP sends the passwords just as you typed them – For anyone to read! However it is a great choice for this example because you will be able to see what the data from a Wireshark capture would look like if any of the programs (applications) you use were to send your passwords in clear text.

There are several methods the instructor mentions if you want to look at network traffic other than on your own computer. This should only be done if you are a true forensics investigator, law enforcement, or a network administrator. This is because the Wireshark program has to be running on the computer where you are trying to capture the data. The program records all communications from your computer and all the communications into your computer so it has to be in the *data path*. Imagine Wireshark as the answering machine that records all calls in and out of your house or office building – the phone line is like a physical *data path*. The terms she used – network tap, hub out, span switch ports, or setting the wireless adapter to promiscuous mode (in addition to the AirPcap adapter which you have to pay for) – are only mentioned here so that it clarifies the jargon she uses to describe ways of putting the Wireshark program in the data path.



Now it is Your turn!

Watch the tutorial. Then....

Can you find the clear text passwords in the sample file?

Try it out!

1. Open Wireshark from your thumb drive
   a. Double click on the WireShark Folder
   b. Double click on the WiresharkPortable icon.
2. Once the Wireshark program has launched
   a. Click on File and select Open
   b. Choose the SAMPLEDATA.ws file
3. Review the file to find all the clear text passwords. If you need to watch the tutorial again, a copy is on your thumb drive.

List all the clear text passwords you find here:

_____

_____

_____

_____

If you have time, review the file to investigate which clients (applications or programs) are sending clear text passwords. Write the names of the programs next to the passwords

If this was your computer, what would you do?

SECURE IT Program
Strategies to Encourage Careers in Cybersecurity and IT

- Community Development Model Framework
  - Each after school and/or summer program is **led by teacher at the host school**/school district
  - **Materials, resources and professional development** are delivered to teachers to run the program
  - While not limited to, we **encourage school clusters** to participate to promote sustainability of program and student retention throughout the K12 experience
  - Guidance counselors and educators from the host school attend the **C3 conference** and **Guidance Counselor** workshop
  - All activities within the modules have take-home activities for students to do with **parent**s or share with parents
  - Students receive certificates and trophies for participation (get larger each year participating)
  - Standards and Research Driven
  - Content and activities tested, modified and on-going data analysis

K12 Pipeline

- Teacher Cisco Academy Training Program
- Educator Training
- C3 Conference-C3 Awards and Grants
- Security Awareness Events

What's Missing

2 Year ⟶ 4 Year

What's Missing

High School → 2 Year → 4 Year

High School
Information Assurance Track

- CW 110 Computer Ethics (can also make use of Simulation Case studies via NSF grant)

- CW 130 Understanding Operating Systems
- **CW 160 Computer Security, Security+**
- CW 150/151 Networking—w/ some existing track course (Cisco 1 & 2)

- Other ideas
- CW 230 Windows 2003 Server
- **CW 235 Network Defense and Countermeasures**

Foundation needed for:

CompTIA's Security + Cisco CCNA Preparation certificate

Apply credits IA A.A.S. degree CISSP Prep Exam

WIRESHARK Certified network Analyst

CCENT Cert

Training

Sponsored by the National Science Foundation

Dissemination and Outreach

- Presentations to academic conferences, government agencies, and industry associations
- Newsletters, news articles, and reports
- Speakers Bureau

All Designed To:

- Promote information assurance education at all levels
- Promote CyberWatch memberships and partnerships


GOOD
TECH HABITS
Manage personal safety
Protect the privacy of others
Manage a positive personal reputation
Value relationships with others
Respect the ownership of intellectual property
Protect the technology used at school
Educational Technology Policy
Linking Research
to Practice
Research and Outreach

SECURE IT:

Strategies to Encourage Careers in Cybersecurity and IT

Elementary **MINDTOOLS**	Formal: Individual Classroom Activities Formal: Extension Units Informal: After School Program	*JR. FIRST Lego League* *FIRST Lego League (FLL)* *eCYBERMISSION*
Middle **JR CYBERWARRIORS**	Formal: Individual Classroom Activities Formal: Extension Units Informal: After School Program	*FIRST Lego League (FLL)* *eCYBERMISSION* *Am Comp Sc League*
High **CYBERWARRIOR**	Informal: After School Cyber Clubs & Summer Program CTE : IA Track	*FIRST Tech Challenge* *FIRST Robotics* *Am Comp Sc League* *Image Cup* *High School CCC* *Patriots* *US CyberChallenge* *Forensics Cup* *DHS PSA* *NACLO* *ILO* *STS* *ISEF*

2 Year Program

4 Year Program +

Other Activities	*Parent Awareness* *Community Awareness* *Teacher Training* *K12 C3 Awareness Contest* *Cybersecurity Olympiad* *C3 Awareness grants*
Cool Careers in CyberSecurity for Girls Event	
C3: CyberEthics, Safety & Security Conference	
Careers in IS/IA and Digital Forensics for Guidance Counselors Workshop	

New Efforts in 2011

- HS Networking Security Competition
- Mid-Atlantic CCDC High School Activities: March 10-12, 2011
  - High school shadowing and activities for HS students
- MD US Cyber Challenge:
  MD July 11-15 and July 18-22
  - MD HS students AND teachers
  - 4 full days of instruction followed by capture the flag exercise
- 2011 Summer Cybersecurity Pathways PD
  - For teachers teaching CTE track
  - VMware & CCNA
- C3 Schools Initiative (Cyber Schools)
- CyberMaryland
- C3 Student/Educator Newsletter
- Journal of Cyberethics, Safety and Security Education

Thank You!

- BACKUP

CW Model IA Programs

:: A.A.S. in Information Assurance
:: A.S. in Information Assurance
:: Certificate in Information Assurance
:: Certificate in Information Assurance Management

Curriculum development emphasizes:

- building core technical skills
- meeting 4011 and/or 4013 standards
- help prepare for several industry certifications including:

:: CompTIA's Network+ and Security+
:: Cisco Certified Network Associate (CCNA)
:: Microsoft Certified Professional (MCP)
:: Security Certified Network Professional (SCNP)

Model A.A.S. Degree

	FIRST YEAR		SECOND YEAR	
Credit Hours	Semester 1	Semester 2	Semester 3	Semester 4
:: Technical Courses :: 43 credits	:: CW 110 - Ethics and the Information Age :: 3 credits	:: CW 150 - Networking 1 :: 4 credits	:: CW 250 - Networking 3 :: 4 credits	:: CW 235 - Network Defense and Countermeasures :: 3 credits
:: English :: 6 credits	:: CW 120 - Introduction to Computers :: 3 credits	:: CW 151 - Networking 2 :: 4 credits	:: CW 251 - Networking 4 :: 4 credits	:: Biological/Physical Sciences :: 3-4 credits
:: Mathematics :: 3-4 credits	:: CW 130 - Microcomputer Operating Systems :: 3 credits	:: CW 160 - Security+ :: 3 credits	:: CW 225 - Hardening the Infrastructure :: 3 credits	:: Social/Behavioral Sciences :: 3 credits
:: Arts and Humanities :: 3 credits	:: English: Composition 1 :: 3 credits	:: English: Composition 2 :: 3 credits	:: Technical Elective #1 :: 3 credits	:: Technical Elective #2 :: 3 credits
:: Health/Fitness/Wellness :: 3 credits	:: Mathematics :: 3-4 credits	:: CW 230 - Microsoft Windows Server 2003 :: 3 credits	:: Health/Fitness/Wellness :: 3 credits	:: CW 270 - Capstone :: 3 credits
:: Social/Behavioral Sciences :: 3 credits				
:: Biological/Physical Sciences :: 3-4 credits				
64-66 credits	15-16 credits	17 credits	17 credits	15-16 credits

A.A.S.

First Year		*Second Year*	
Semester 1	Semester 2	Semester 3	Semester 4
CW 110 Ethics and the Information Age	CW 150 Networking 1	CW 250 Networking 3	CW 235 Network Defense & Counter-measures
CW 120 Intro to Computers	CW 151 Networking 2	CW 251 Networking 4	Bio or Physical Science
CW 130 Operating Systems	CW 160 Security +	CW 225 Hardening the Infrastr'r	Social & Behavioral Science
Comp'n & Intro to Literature 1	Comp'n & Literature 2	CW Technical Elective 1	CW Technical Elective 2
College Algebra or Calculus	CW 230 Windows 2003 Server	PHE/HEA Health/ Fitness/ Wellness	CW 270 Capstone

Model A.S. IA Degree

	FIRST YEAR		SECOND YEAR	
Credit Hours	Semester 1	Semester 2	Semester 3	Semester 4
:: Technical Courses :: 40 credits	:: CW 110 - Ethics and the Information Age :: 3 credits	:: CW 150 - Networking 1 :: 4 credits	:: CW 250 - Networking 3 :: 4 credits	:: CW 235 - Network Defense and Countermeasures :: 3 credits
:: English :: 6 credits	:: CW 120 - Introduction to Computers :: 3 credits	:: CW 151 - Networking 2 :: 4 credits	:: CW 251 - Networking 4 :: 4 credits	:: Biological/Physical Sciences :: 3-4 credits
:: Mathematics :: 3-4 credits	:: CW 130 - Microcomputer Operating Systems :: 3 credits	:: CW 160 - Security+ :: 3 credits	:: CW 225 - Hardening the Infrastructure :: 3 credits	:: Social/Behavioral Sciences :: 3 credits
:: Gen Ed :: 6 credits	:: Composition and Introduction to Literature 1 :: 3 credits	:: Composition and Introduction to Literature 2 :: 3 credits	:: Gen Ed :: 3 credits	:: Gen Ed :: 3 credits
:: Health/Fitness/Wellness :: 3 credits	:: College Algebra or Calculus :: 3-4 credits	:: CW 230 - Microsoft Windows Server 2003 :: 3 credits	:: Health/Fitness/Wellness :: 3 credits	:: CW 270 - Capstone :: 3 credits
:: Social/Behavioral Sciences :: 3 credits				
:: Biological/Physical Sciences :: 3-4 credits				
64-66 credits	15-16 credits	17 credits	17 credits	15-16 credits

A.S.

First Year		*Second Year*	
Semester 1	Semester 2	Semester 3	Semester 4
CW 110 Ethics and the Information Age	CW 150 Networking 1	CW 250 Networking 3	CW 235 Network Defense & Counter-measures
CW 120 Intro to Computers	CW 151 Networking 2	CW 251 Networking 4	Bio or Physical Science
CW 130 Operating Systems	CW 160 Security +	CW 225 Hardening the Infrastr'r	Social & Behavioral Science
Comp'n & Intro to Literature 1	Comp'n & Literature 2	GenEd	GenEd
College Algebra or Calculus	CW 230 Windows 2003 Server	PHE/HEA Health/ Fitness/ Wellness	CW 270 Capstone

IA Certificate

	FIRST YEAR		SECOND YEAR	
Credit Hours	Semester 1	Semester 2	Semester 3	Semester 4
	:: CW 110 - Ethics and the Information Age :: 3 credits	:: CW 150 - Networking 1 :: 4 credits	:: CW 250 - Networking 3 :: 4 credits	:: CW 235 - Network Defense and Countermeasures :: 3 credits
	:: CW 120 - Introduction to Computers :: 3 credits	:: CW 151 - Networking 2 :: 4 credits	:: CW 251 - Networking 4 :: 4 credits	:: Technical Elective #2 :: 3 credits
	:: CW 130 - Microcomputer Operating Systems :: 3 credits	:: CW 160 - Security+ :: 3 credits	:: CW 225 - Hardening the Infrastructure :: 3 credits	:: CW 270 - Capstone :: 3 credits
		:: CW 230 - Microsoft Windows Server 2003 :: 3 credits	:: Technical Elective #1 :: 3 credits	
46 credits	9 credits	14 credits	14 credits	9 credits

IA/IS Management Certificate

Information Security Management Certificate

This certificate will help meet the needs of technical and security staff for both managing and implementing information security projects. Coursework may include basic computer operations, operating systems, security, cyber law, disaster recovery, project management and systems analysis. Students wishing to continue may apply these credits to the Information Security A.A.S. degree. Students are also encouraged to complete the Information Security Certificate and the Cisco CCNA Preparation Certificate offered by the Engineering Technology department.

All three certificates may be applied to the Information Security A.A.S. degree program. Support for this certificate program was obtained via the Maryland Higher Education Committee BRAC initiative.

CIS 1010 Computer Literacy	3
CIS 1700 Understanding Operating Systems	3
CIS 1620 Computer Security, Security+	3
CIS 2840 Systems Analysis and Project Management	4
Choose one of the following	
MGT 2860 Cyber Law	3
MGT 1900 Introduction to Public Administration	3
MGT 2880 Disaster Recovery and Risk Management	3
Total Required for Certificate	**16 credits**

SECURITY NEEDS

- " Cybersecurity is one of the top priorities of the Department of Homeland Security and the federal government"
- "… The DHS plans to build the next generation of our cybersecurity workforce by committing resources to educating and training current employees [and] recruiting new talent."
- "The unavailability of people with the right skills is a top challenge for security groups."

President's 60 Day Cyberspace Policy Report

- "The United States should initiate a K-12 cybersecurity education program for digital safety, ethics, and security; expand university curricula; and set the conditions to create a competent workforce for the digital age."

Cyberspace Policy Report

- Report suggests:
  - Initiation of a **national public awareness and education** campaign to promote cybersecurity risk awareness for all citizens;
  - Changes in the **educational system** that will help **enhance the understanding of cybersecurity** and allow the United States to retain and expand upon its scientific, engineering, and market leadership in information technology; and \
  - Development of educational opportunities and strategies that will **expand and train the workforce** to protect the Nation's competitive advantage, including attracting and retaining cybersecurity expertise in the Federal government