ENIGMA


cyber

CNBC

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Want job security? Try cybersecurity

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Jennifer Schlesinger

Sunday, 6 Dec 2015

CNBC

November 18, 2015 3:05 pm

Cyber security sector struggles to fill skills gap

Nicholas Megaw in London

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Demand for cyber security experts quadruples following high-profile hacks

"Christmas has come early" for cyber security experts following Ashley Madison, Sony and TalkTalk hacks, pushing hiring in the UK jobs market to

OIG

Top Management and Performance Challenges Facing the Department of Justice

November 10, 2015

MEMORANDUM FOR

burningglass®

CAREERS IN FOCUS

Job Market Intelligence: Cybersecurity Jobs, 2015

Taulbee Survey

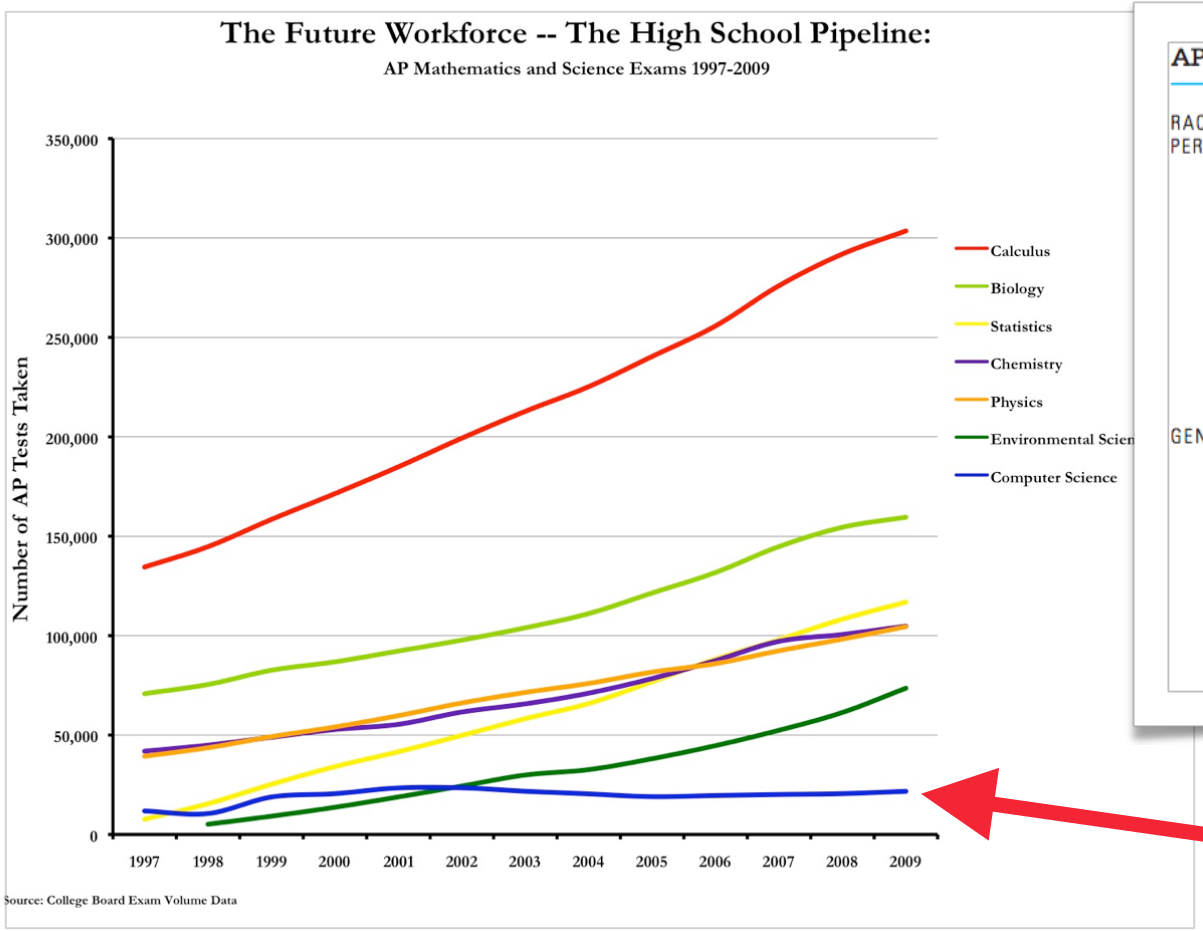
Table D4. Employment of New PhD Recipients By Spe

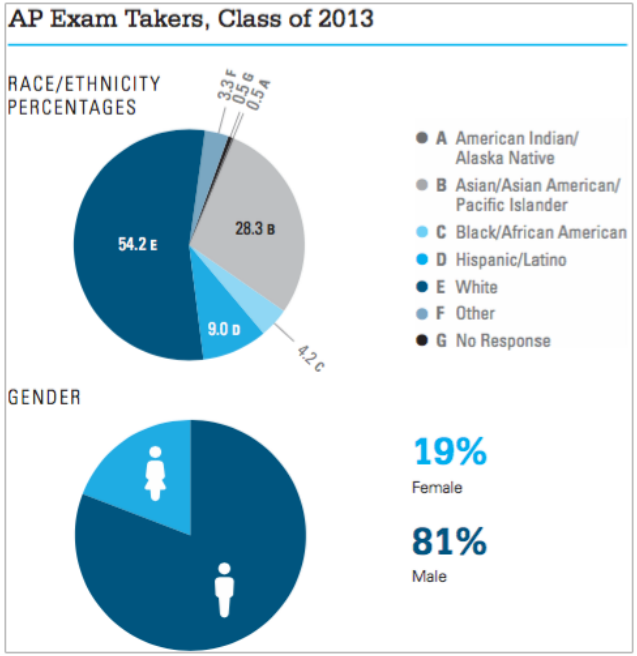
	Artificial Intelligence	Computer-Supported Cooperative Work	Databases/Information Retrieval	Graphics/Visualization	Hardware/Architecture	Human-Computer Interaction	High-Performance Computing	Informatics: Biomedical/	Information Assurance/Security		Information Systems	
North American PhD Granting Depts.												
Tenure-track	10	0	10	7	4	4	4		4	0	4	1
Researcher	8	0	2	1	3	0	2		2	0	0	
Postdoc	17	1	7	12	9	6	4	1	5	4	4	1
Teaching Faculty	4	0	2	0	1	0	0		3	0	3	
North American, Other Academic												
Other CS/CE/I Dept.	4	0	3	1	2	1	2		1	3	1	
Non-CS/CE/I Dept	0	0	1	0	0	0	0		1	7	0	
North American, Non-Academic												
Industry	85	0	78	57	47	23	27	3	32	7	24	9
Government	8	0	2	2	0	1	2		5	3	0	
Self-Employed	2	1	1	3	1	0	1	0	0	1	0	
Unemployed	0	0	0	0	1	0	0	0	2	1	0	
Other	1	0	2	0	3	0	1	2	0	0	0	
Total Inside North America												
	139	2	108	83	71	35	43	57	55	36	36	12

Table B7. Bachelors Degrees Awarded by Gender and Ethnicity, From 125 Departments Providing Breakdown Data

	CS					CE					I					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	657	168	59	8	13	139	26	19	8	12	87	34	0	4	7	1,189	8.3
Amer Indian/ Alaska Native	31	4	0	0	0	12	7	1	1	3	8	[illegible]	[illegible]	[illegible]	[illegible]	63	0.4
Asian	1,598	421	60	20	32	413	76	10	25	34	301	103	0	15	20	2,982	20.8
Black or African American	[illegible]	54	16	3	4	58	7	0	4	3	152	54	0	8	11	[illegible]	[illegible]
Native Hawaiian/ Pacific Islander	[illegible]	0	0	0	1	5	2	0	0	1	7	1	0	0	0	[illegible]	[illegible]
White	4,923	539	225	60	41	845	83	42	51	37	1,200	265	1	60	51	8,123	56.7
Multiracial, not Hispanic	126	28	14	2	2	34	5	0	2	2	30	12	[illegible]	[illegible]	[illegible]	249	1.7
Hispanic, any Race	580	83	9	7	6	145	16	2	9	7	223	47	0	11	9	1,105	7.7
Total Res & Ethnicity Known	8,175	1,303	383			1,651	222	74			2,008	516	1			14,333	
Resident, Ethnicity Unknown	349	54	10			58	8	4			80	13	0			576	
Not Reported (N/R)	1,821	344	147			346	29	25			22	8	22			2,328	
Gender Totals	10,345	1,701	182			2,055	259	25			2,110	537	23			17,237	
%	85.9%	14.1%				88.8%	11.2%				79.7%	20.3%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known





Computer Science

equality

viability

quality

Computer Science Curricula 2013

Curriculum Guidelines for Undergraduate Degree Programs in Computer Science

December 20, 2013

The Joint Task Force on Computing Curricula
Association for Computing Machinery (ACM)
IEEE Computer Society

Core Hours in Knowledge Areas

An overview of the number of core hours (both Tier-1 and Tier-2) by KA in the CS2013 Body of Knowledge is provided below. For comparison, the number of core hours from both the previous CS2008 and CC2001 reports are provided as well.

Knowledge Area	CS2013 Tier1	CS2013 Tier2	CS2008 Core	CC2001 Core
AL-Algorithms and Complexity	19	9	31	31
AR-Architecture and Organization	0	16	36	36
CN-Computational Science	1	0	0	0
DS-Discrete Structures	37	4	43	43
GV-Graphics and Visualization	2	1	3	3
HCI-Human Computer Interaction	4	4	8	8
IAS-Information Assurance and Security	3	6	--	--
IM-Information Management	1	9	[illegible]	[illegible]
IS-Intelligent Systems	0	10	10	10
NC-Networking and Communication	3	7	15	15
OS-Operating Systems	4	11	18	18
PBD-Platform-based Development	0	0	--	--
PD-Parallel and Distributed Computing	5	10	--	--
PL-Programming Languages	8	20	21	21
SDF-Software Development Fundamentals	43	0	47	38
SE-Software Engineering	6	22	31	31
[illegible]	18	9	--	--

self-selected student body

established habits & limited runway

security is not an elective

security can be hard

```
00008054 <_start>:
    8054:       e28f6001        add     r6, pc, #1
    8058:       e12fff16        bx      r6
    805c:       1b24            subs    r4, r4, r4
    805e:       1c22            adds    r2, r4, #0
    8060:       21ff            movs    r1, #255
    8062:       31ff            adds    r1, #255
    8064:       31ff            adds    r1, #255
    8066:       31ff            adds    r1, #255
    8068:       3105            adds    r1, #5
    806a:       4678            mov     r0, pc
    806c:       302a            adds    r0, #42 ; 0x2a
    806e:       2705            movs    r7, #5
    8070:       df01            svc     1
    8072:       2214            movs    r2, #20
    8074:       4679            mov     r1, pc
    8076:       310c            adds    r1, #12
    8078:       2704            movs    r7, #4
    807a:       df01            svc     1
    807c:       1b24            subs    r4, r4, r4
    807e:       1c20            adds    r0, r4, #0
```

security can be hard

perceptions & realities

BUILD
BREAK
FIX
IT

MIT LL CTF
learn | hack | win

CSAW'15
NYU School of Engineering

"A team competing in the CTF competition at DEF CON 17 in Las Vegas, Nevada, United States."

rule interpretation & testing

strategic thinking

identifying motivations

moves & countermoves

cybersecurity concepts are game concepts

authentic problems

counterfactual thinking

Cal Poly CPE123

social & fun

engaging & immersive

This is my super secure password storage center.

I was tired of insecure systems that had only ONE password protecting ALL the passwords.

In my system, you must get through all the base authentications to even GET to the per-password security. Each password is secured by a different password, but you can make it less secure than normal because it's so hard to get in.

Enter Access Code Below:

1 2 3

4 5 6

7 8 9

0

LEVEL FIVE AUTHORIZATION

Access Denied, Please Try Again Maintenance mode over, password bug fixed.

SHA-1 HASHES DO NOT MATCH

'943f264d7534aad8d4f5fdda2ed7e16d088f56de' != '77361fca965b3e53ff81a5d48525ca8adb8a9b87'

Password: _____

Submit

```
import hashlib

f = open("/usr/share/dict/words")

for guess in f.readlines():
    digest = hashlib.sha1(guess).hexdigest()
    if digest == "2d1b30542e3bcc8467096e4407e1276d026e4169":
        print "Found it:", guess
```

modularity

file I/O

loops

objects & methods

conditionals

reflective journals

near-peer instruction

pedagogical

POGIL

efficacy

efficacy

“wouldn’t be as fun without the game”

“hacking doesn’t mean being amoral”

“opens an entirely new world”

“I want to stay in the major”

“I have a power that can lead to the greater good”

physical security

caution &
curiosity

behaviors

thoughtful apathy


CONTROL-ALT HACK
WHITE HAT HACKING
FOR FUN AND PROFIT
FRANZI
ROXANNE
KARL
ATTENDANCE
ENTROPY
MISSION


ThinkFun
ROBOT Turtles
The Game for Little Programmers!
Introduces Basic Coding Concepts to Preschoolers!
The most backed board game in KICKSTARTER history!
AGES 4 and up
2-5 players
WARNING: CHOKING HAZARD


Microsoft
elevation of privilege

accessible

social

unobtrusive

modest

[d0x3d!]

a network security game


wireless router
primary DNS server
[action]
[cryptanalyst]
[move] or
[compromise]
diagonally.
internet gateway
firewall
requires two actions to compromise
web server
client
secondary DNS server
client
SMTP server
VoIP server
single sign-on service
backup file server
NAT device
VLAN switch


[social engineer]
[phishing]
[loot!]
[war driver]

[digital asset drives]

fried chicken

TableTopSecurity/d0x3d-t

GitHub, Inc. [US] https://github.com/TableTopSecurity/d0x3d-the-game

GitHub | This repository | Search or type a command | Explore | Features | Enterprise | Blog | Sign up | Sign in

TableTopSecurity / d0x3d-the-game

Star 111 | Fork 21

Source materials for [d0x3d!], a network security game.

20 commits | 1 branch | 0 releases | 3 contributors

branch: master | d0x3d-the-game /

Added print-and-play Scribus and PDFs. These have better cut lines th… ...

gondree authored 7 months ago — latest commit 656a192697

contribs	Tweak language	7 months ago
instructions	fixed manual: infocon zero s/b infocon one	7 months ago
masters	fixed manual: infocon zero s/b infocon one	7 months ago
self-print	Added print-and-play Scribus and PDFs. These have better cut lines th…	7 months ago
tgc-print	First edition (v1.1) release materials	8 months ago
LICENSE	fixed margins and spacing	8 months ago
README	Moved print-and-play to contribs, to encourage improvements or altern…	7 months ago

Code

Issues 1

Pull Requests 0

Pulse

Graphs

Network

HTTPS clone URL

https://github.com/

You can clone with HTTPS, Subversion, and other methods.

Clone in Desktop

Home Connect Discover Me Search

Iván Sánchez Ortega
@RealIvanSanchez

Follow

Finally, my printed-at-home @d0x3d set is ready for play. :-)
pic.twitter.com/wdVW5hhO

Reply Retweet Favorite

12:41 AM - 12 Jan 13 · Embed this Tweet

Flag media

Reply to @RealIvanSanchez @d0x3d

Javier Cantero @jcantero 12 Jan
@RealIvanSanchez ¿Lo has imprimido en alguna copistería o con una impresora casera?
Details

Iván Sánchez Ortega @RealIvanSanchez 12 Jan
@jcantero En una impresora láser color normalilla. Luego


[d0x3d!]
a network security game
30-60
infocon 5
infocon 4
infocon 3
infocon 2
infocon 1
[patch 2]
[patch 3]
[patch 4]
[patch 5]
[you got d0x3d!]
[d0x3d!]
certificate services
wireless router
wireless router
[patch!]
[!oot!]
[digital asset drives]
financial data
authentication credentials
personally identifiable information
Special Ability:
As one action, [move] to any compromised tile.
[social engineer]
Special Ability:
As one action, [give] or [exchange] a card to a player anywhere on the network.
[war driver]
Special Ability:
As one action, [move] across two compromised tiles.
[malware writer]
Special Ability:
As one action, [compromise] two adjacent tiles.
[the insider]
Special Ability:
As one action, [give] or [exchange] two cards.
[botmaster]
Special Ability:
As one action, [move] or [compromise] diagonally.
[cryptanalyst]
order of play
1. [action]
Take up to 3 actions:
[move], [compromise], [drop], [give], [exchange], [pickup], [recover]
2. [!oot]
Draw 2 [!oot!] cards. Resolve [intrusion detected] and [honeypot audit] cards.
3. [patch]
Draw and resolve [patch!] cards, as indicated by the [infocon] level.
4. [check]
Discard, to obey the hand limit.
[intrusion detected]: Raise the [infocon] level.
[honeypot audit]: Immediately draw a [patch!] card. If the pictured [node] is compromised, raise the [infocon] level.
[check]: The hand limit is five cards. Every card in excess of the hand limit must be discarded. You may play [zero-day exploits] before discarding them.
[patch] situations:
• Any [!oot!] cards left on a [node] being patched are discarded.
• If a player is on a node being patched, she must [move] to a compromised node (obeying normal movement rules), then [decommission] the node and its [patch!] card.
• [zero-day exploits] can be used to prevent all [patch] effects.
the GAME CRAFTER


1200+ sales

d0x3d.com

welcome | get the game | ideas for use | about | faq | media

[ab0ut]

[d0x3d!] is a board game designed to introduce a diverse body of students to network security terminology, attack & defend mechanics, and basic computer security concepts.

[d0x3d!] is totally open-source, and made freely available for order, download and remixing.

Ready to jump in?

[n3ws]

We have released some curriculum modules when using [d0x3d!] in the classroom.

A paper on early experiences with [d0x3d!] appeared at CSET '13. Read a copy here.

Check out our article with Control-Alt-Hack's Tamara Denning on tabletop-gaming in security appearing in the May-June issue of IEEE Security & Privacy.

An Introduction to Digital Assets

Lesson Plan for grades 9–12
Time: 2 periods (50 min ea.)

INTRODUCTION

One goal of network security is to protect the information, or data, we value. These data may represent a variety of things, ranging from the last four digits of your social security number to the plans for a new cutting-edge invention. We also value data in variety ways.

In the game [d0x3d!], the objective is to reclaim four stolen "digital assets," namely: authentication credentials, financial data, intellectual property, and personally identifiable information. In this lesson—intended to be used prior to and after playing the game—we explore the idea of digital assets in more depth, to better appreciate the importance of securing the data we value in our own lives. It is intended to be taught over two 50 minute class periods.

SUMMARY

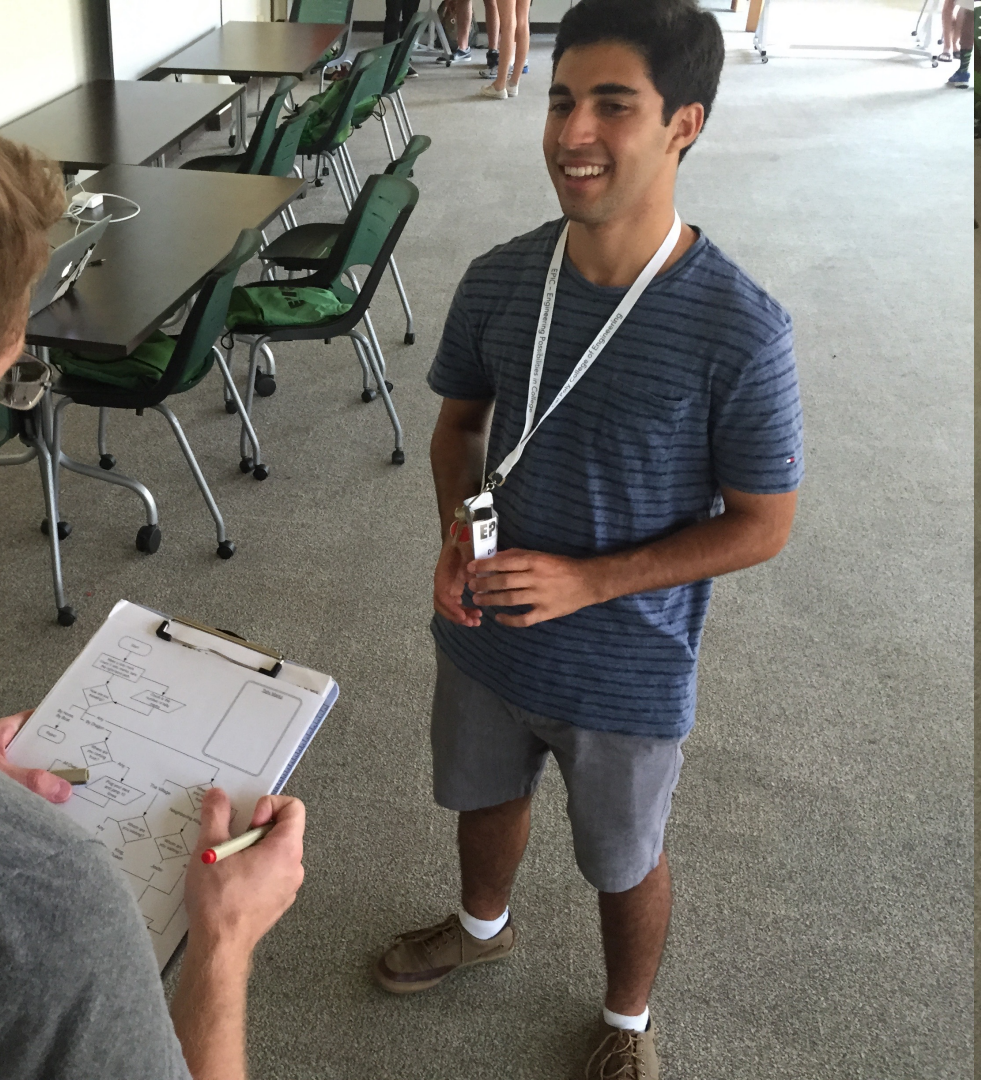
Students will learn about valued, digital data and relate them to their lives and the real world.

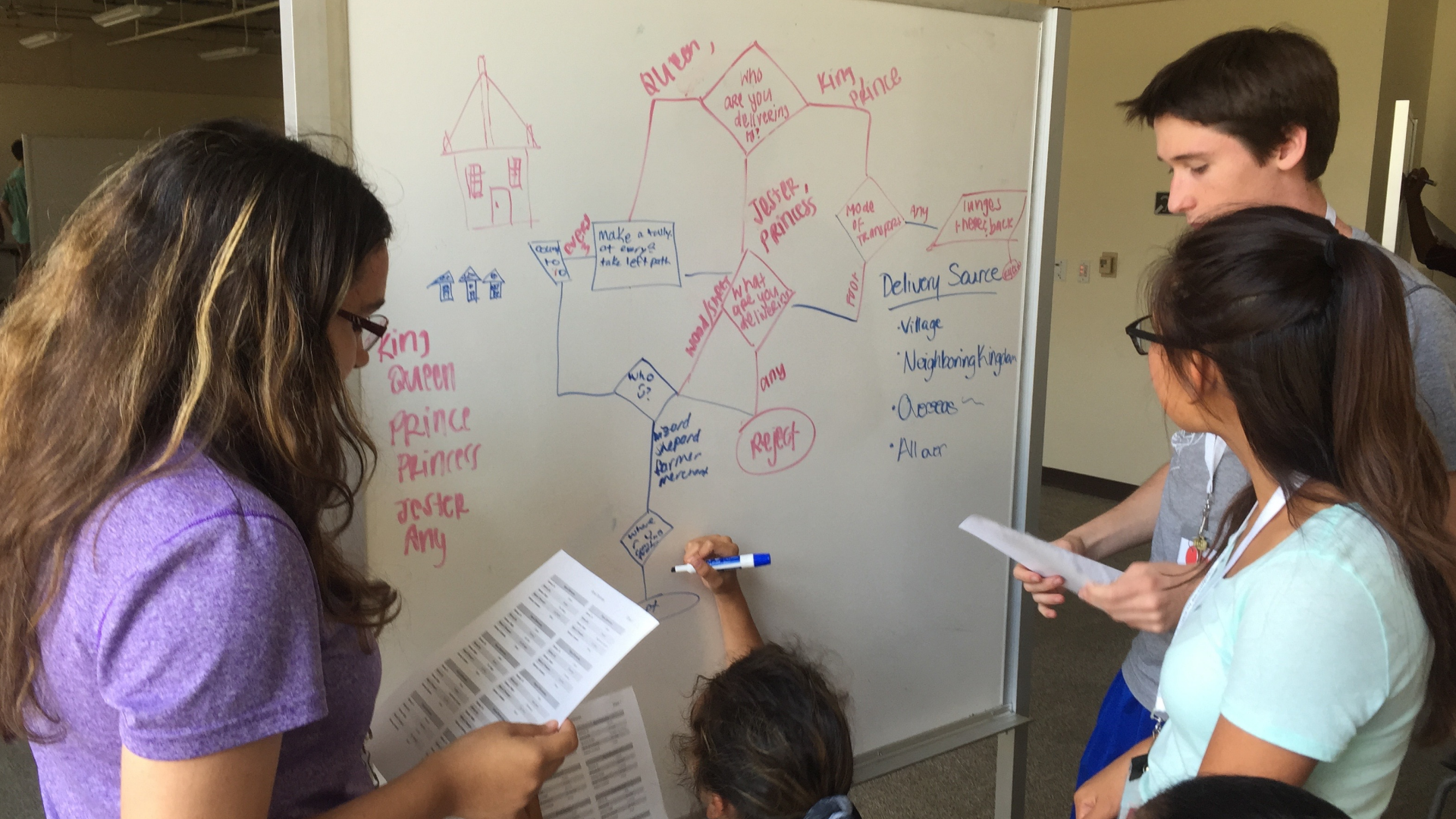
Objectives

1. Student will be able to define what a digital asset is, generically.
2. Students will be able to describe some characteristics of the four types of digital assets present in the game [d0x3d!].
3. Students will be able to give some examples of digital assets in their own lives.
4. Students will be able to describe and compare scenarios where digital assets have been compromised, in terms of potential effects or damages in the real world.

Standards

- (CCSS.ELA-Literacy.CCRA.W.1) Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.
- (CCSS.ELA-Literacy.SL.11-12.1b) Work with peers to promote civil, democratic discussions and decision-making set clear goals and deadlines, and establish individual roles as needed.
- (CCSS.ELA-Literacy.RI.11-12.1) Cite strong and thorough textual evidence to su
explicitly as well as inferences drawn from the text, including det
- (McREL Technology. Standard 3. Grade 9-12) U
and the individual.
- (McREL T




Queen,
Who are you delivering to?
King
Prince
Jester, Princess
Mode of transport
Any
Make a truly at every take left path
What are you delivering
Any
Reject
Delivery Source
Village
Neighboring Kingdom
Overseas
All over
King
Queen
Prince
Princess
Jester
Any

challenges

terminology

student needs

educator needs

assessment

(shameless plug)

what can you do?

thank you

ENIGMA