

Interactive Game Design with Alice “Bit by Bit: Advancing Cyber Security”

Level:	Middle School
Type of Contest:	Team
Composition of Team:	3 – 4 students per team
Number of Teams:	10 entries per state

Alice is an innovative 3D programming environment that makes it easy and fun for students to learn fundamental constructs of object-oriented programming through the creation of animated movies and simple video games. Designed to be a teaching tool for introductory computing, it uses 3D graphics and a drag-and-drop interface to facilitate a more engaging, less frustrating first-time programming experience.

OVERVIEW

Develop an educational and creative interactive game using Alice to teach principles of safe and ethical cyber use. The game should have multiple levels, each addressing a different aspect of the team’s selected theme (see attached list). Final Projects will be submitted electronically to a statewide URL for judging by 5:00 pm on February 23, 2018.

RULES

1. All entries **must** be designed and created by MESA students using Alice 2 (found at <http://www.alice.org/get-alice/alice-2/>) or Alice 3 (<http://www.alice.org/get-alice/alice-3/>) sure to indicate which version you are using.
For example worlds and games created in Alice please see:
<http://www.cs.duke.edu/csed/alice09/examples.php>
2. Each game **must** have no less than 15 animated objects/characters.
3. Each game **must** include sound or voice effects.
4. Each game **must** have no less than 3 levels, each addressing a particular aspect of the team’s chosen cyber theme. A level change in the look, actions, or purpose of the animated objects/characters. Other creative changes are encouraged.
5. A level should take between 2 and 3 minutes to play.
6. All levels **must** have 1) a restart button and a return to main menu button that function while the level is executing OR 2) a scoring component that allows the player to generate a final score at the end of the game.

7. The game **must** be informative about their cyber topic.
8. The game **must** contain clear in-game instructions relevant to all ages and skill levels. Teams **must** also submit an instructional document in Microsoft Word format (limit is 3 pages) at the time of game submission.
9. Each team is required to submit their programs electronically for judging.
The email address for submission will be announced in February. Each submission must include on the subject line: Alice Virtual Contest. In the body of the email, include student name(s), school name, and MESA Center. Each team **must** provide a list of sources for the information that they present in the game. This bibliography can include information from any source (e.g. web content, books, interviews), but all content should be referenced appropriately.
10. Judges reserve the right to contact contestants prior/during judging for verification of student work.

JUDGING

Games will be judged in the following categories (See attached rubric):

- Creative Design and Game Play 30 points
- Demonstration of Technology Fluency 30 points
- Instructional Document and Bibliography 20 points
- Clarity of Message 20 points

Awards

Medals will be awarded for first, second, and third place teams overall and by region. Center Directors will be notified about local and regional winners in March.

SCORING

Judges will score games individually. The average score of all judges' results will be totaled to determine the score for each team.

ALL DECISIONS MADE BY THE JUDGES ARE FINAL

CYBER THEMES FOR GAME DESIGN

The following broad cyber subject areas of *Awareness*, *Safety*, *Ethics* and *Skills* must be used as the basis for game creation. Each team must start by picking one of these subject areas to work within. From there, teams must choose one particular cyber theme within that subject area to focus their game on. There are four cyber themes (showing up in the colored bars below) per subject area. Each team is responsible for exhibiting in-depth comprehension of their chosen theme. A bulleted list of topic suggestions is provided for each cyber theme, but teams may feel free to choose topics not included in the list, if they are clearly relevant. Teams should incorporate one topic per game level.

AWARENESS

Keeping systems safe from viruses, malware and spyware

- Updating anti-virus software
- Correcting settings on a firewall
- Updating operating systems

Protecting personal information on public computers

- Browser settings
- Controlling the cache
- Appropriate use of web browsing

Identifying malicious and deceptive emails

- Phishing
- Malicious urls
- Attachments
- Spam

Downloading games and programs safely

- Virus scanning
- Trusted sites
- File types
- Smart searching

SAFETY

Maintaining physical safety when using social media

- Responsible photo posting
- Supervised real-world meetings
- Appropriate topics and language
- Preventing TMI (too much information)

Discouraging and reporting cyber bullying

- Appropriate topics and language
- Lifecycle of a post
- Discussion board moderation

Safe web browsing habits

- Trusted sites
- Smart searching
- Information sharing on websites
- Online purchasing

Device safety

- Setting strong passwords
- Appropriate material to store on mobile devices
- Encrypting wireless connections

ETHICS

Responsible use of other people's web content

- Digital plagiarism
- How to reference web content (text and media)
- File sharing

Appropriate use of non-personal resources

- Web surfing on public computers
- WiFi Sharing

Responsible use and sharing of code

- Freeware sites
- Licensing agreements
- Open source programs

Being a good cyber citizen

- Anonymous posting
- Discussion board monitoring
- Email forwarding

SKILLS

Programming fundamentals

- What is a programming language and what common languages are used today?
- What is a compiler?
- What different kinds of files make up a program?
- What is the difference between an executable and source code?

Computer anatomy

- Input/output devices
- Data storage hardware (hard disks, USB memory, RAM)
- Processing hardware (motherboards, CPUs, video cards)
- Different kinds of software (operating systems, executables, data files)

Encryption/Decryption fundamentals

- Substitution ciphers
- Transposition ciphers

Network fundamentals

- What is a network?
- What is a router/switch?
- What is TCP/IP?
- How do website addresses work?

Interactive Game Design with Alice

Judge: _____

TOPIC: "Bit by Bit: Advancing Cyber Security"

School Name	Creativity/ Game Play (1-30)	Technology Fluency (1-30)	Instructional Document & Bibliography (1-20)	Clarity of Message (1-20)	JUDGE'S TOTAL (max 100)

Comments:

Creative Design & Game Play

30 points (max)

- Alice is a complex programming tool encompassing a wide variety of capabilities. Examine how creative students were in using the many functions of Alice in the design of their game.

Technology Fluency

30 points (max)

- Game works as designed with no errors, player interaction demonstrates an understanding of the programming features that make their game work. Game must have a Restart button and Return to main menu button that function properly. There must be at least 3 levels and the user must be able to play a level over again.

Instructional Document and Bibliography

20 points (max)

- Teams must create an instructional document to explain their uniquely designed Alice game. The document must be submitted as a pdf format. Each team must provide a list of sources for the information that they present in the game. This bibliography can include information from any source (e.g. web content, books, interviews), but all content should be referenced appropriately.

Clarity of Message

20 points (max)

- Teams were tasked with creating a multi-level interactive game that would serve to educate game players on various aspects of the team's chosen cyber theme. Examine games comparatively to determine points that teams should be rewarded. Games must be educational and there must be a bibliography.