

# Nevada: Inspiring the next generation of cybersecurity experts

SANS



A report detailing Nevada's leadership in finding, motivating, and developing the cyber-capable workforce in the United States.

## Dear Governor Sandoval,

Your insight and leadership in bringing CyberStart to the students of Nevada is already paying dividends for them in the form of learning and scholarships, and it can lead to future job growth and improved cybersecurity in Nevada. Results of the CyberStart pilot program, ably managed by Brian Mitchell, Director of Nevada's Office of Science, Innovation and Technology, are summarized below. But before you dig into the numbers and see the lists of high-performing Nevada students, please turn to the back cover of this booklet to enjoy personal notes that participating students wrote specifically for you.

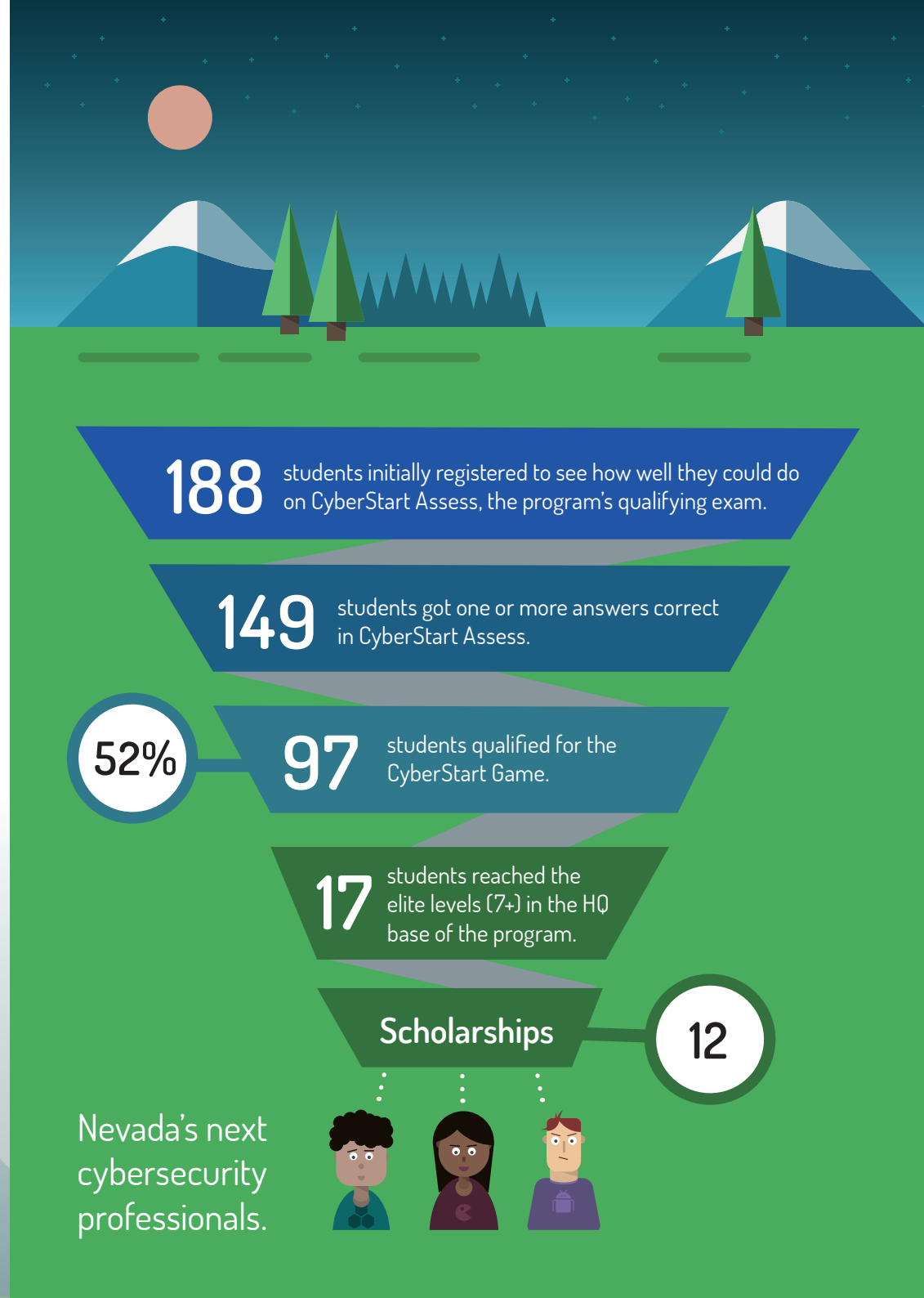
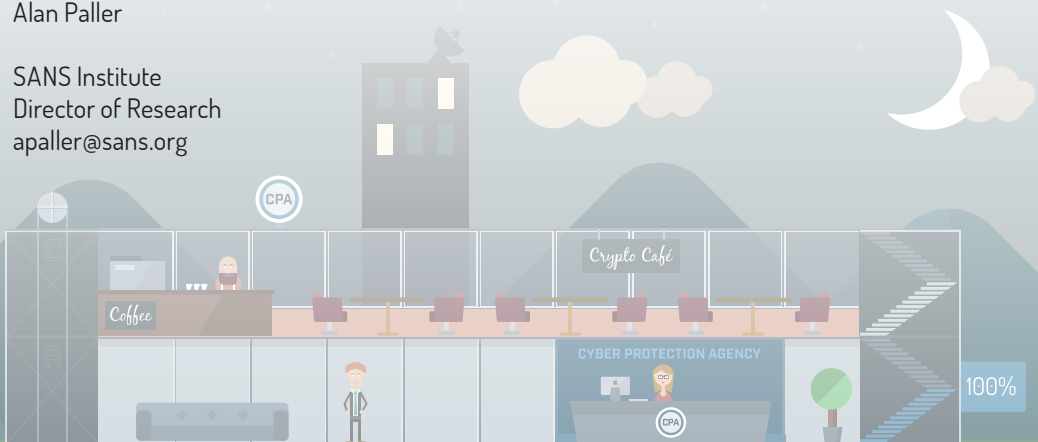
### Program Highlights:

- In just two weeks in July, Brian and your communications team was able to sign up 188 Nevada students.
- Nearly 80% of them solved at least one of the assessment challenges and 52% solved enough to be invited to test their cyber aptitude on the 250+ challenges of the full CyberStart program, which they did during August 2017. At the same time, your fellow governors in six, mostly much larger states, signed up a total of nearly 3,300 students.
- The number one scorer in the country is a student at the University of Nevada at Reno. He and ten other Nevada high school and college students each won scholarships for more advanced education in cybersecurity.
- As you might guess from the students' notes, they liked CyberStart:
  - 96% said they would recommend the program to a friend
  - 91% rated the game either excellent or very good (and this is a tough crowd!)
  - 100% are considering further cybersecurity training after the program

Please let me know if there is anything I can do to help as you continue to identify talent and grow the next generation of cybersecurity experts in Nevada.

Sincerely,  
Alan Paller

SANS Institute  
Director of Research  
apaller@sans.org





## Program Introduction

CyberStart is a forward-thinking skills program designed to supply specialist cybersecurity education to young people across the United States. Using a suite of online challenges, tools and games it aims to inspire the next generation of cybersecurity professionals while identifying the best and most talented young Americans.

We are facing a significant shortage of trained and skilled cybersecurity professionals at a time when online technologies continue to evolve, and cybercriminals are becoming more sophisticated. The only way to solve this problem is to introduce, develop and help young people in high school and college pursue a career in this sector.

## Phases

**CyberStart Assess** is a set of eight questions that test a student's aptitude and existing knowledge of computer security. Based on identifiable, measurable key skills and traits, it works to find young people who possess the innate qualities of an effective security practitioner. Questions look for traits such as problem solving, logical extrapolation and attention to detail, all of which have been proven to be crucial to succeed in a security career.

**CyberStart Game** is where students become exposed to specialist cybersecurity education. Using a suite of online tools, challenges and games, players attempt to solve more than 250 challenges, all of which are realistic examples of tests and threats faced by practicing cybersecurity engineers in their day-to-day lives. The CyberStart Game enables students to start studying security with challenges written by experts who practice these skills in the real world.

## Goals

- Supply specialist cybersecurity education for 16+ year olds.
- Grow the U.S. cyber capable workforce.
- Inspire the next generation of cybersecurity experts.
- Identify the most elite young talent.

## CyberStart Players in Nevada

Key	
**	In the top 100 and awarded a scholarship
*	Awarded a scholarship

Last Name	First Name	School	Top 100/ Scholarship
Aarons	Matthew	Western Nevada College	
Angres	Daniel	Coral Academy of Science	*
Black	Samuel	University of Nevada, Las Vegas	
Capili	Paolo	American Preparatory Academy	
Chapman	Jett	Western Governors University	*
Davidson	Blair	University of Nevada, Las Vegas	
Dionisi	Anthony	University of Nevada, Reno	
Dunaisky	Alexa	Desert Oasis High School	
Ferra	Gino	University of Nevada, Las Vegas	
Fiodorovas	Edgaras	University of Nevada, Reno	**
Galloway	Brenden	Western Nevada College	
Geib	Matthew	University of Nevada, Reno	
Grant	Ian	University of Nevada, Reno	
Jones	Barry	University of Nevada, Reno	
Jorgensen	Parker	College of Southern Nevada	
Kaminsky	Elizabeth	Carson High School	
Knutson	Jared	University of Nevada, Reno	**
Leavitt	Benjamin	University of Nevada, Reno	
Lee	Stephanie	Advanced Technologies Academy	

Last Name	First Name	School	Top 100/ Scholarship
Liu	Jeff	University of Nevada, Reno	
Lowe	Kahleen	University of Nevada, Reno	*
Lowry	Robert	University of Nevada, Reno	
Lucas	Houston	University of Nevada, Reno	
Lujan	Jonathan	University of Nevada, Reno	
Magaña	Daniel	Advanced Technologies Academy	
McCord	Mark	Academy of Arts, Careers, and Technology	
Miller	Ronnie	UMUC	**
Moreno	Carlos	University of Nevada, Las Vegas	**
Muller	Tim	University of Nevada, Reno	*
Pasinski	Alexander	University of Nevada, Reno	*
Poston	Jamie	University of Nevada, Reno	
Prashar	Arush	University of Nevada, Reno	
Price	Casey	College of Southern Nevada	
Purney	Richard	Advanced Technologies Academy	
Ramos	Justin	University of Nevada, Las Vegas	**
Reddy	Anudeep	University of Nevada, Reno	
Reguan	Ernesto	College of Southern Nevada	
Rumjahn	Hadi	University of Nevada, Reno	
Sternberg	Ryan	Eldorado High School	
Stratton	Derek	University of Nevada, Reno	**
Stringer	Jake	Advanced Technologies Academy	
Taylor	Christopher	Devry University	

Last Name	First Name	School	Top 100/ Scholarship
Taylor	Richard	University of Nevada, Reno	
Trainer	Elishia	American University	
Wakatsuki	Adam	Walden University	*
Walker	Adam	Advanced Technologies Academy	
Way	Xanthos	Advanced Technologies Academy	
Wilson	Kyle	Truckee Meadows Community College	
Witherell	Brody	University of Nevada, Las Vegas	
Woodbury	Alana	University of Nevada, Reno	
Xu	Sammi	Southwest Career and Technical Academy	
Young	Jonathan	University of Nevada, Reno	
Yu	Derek	Advanced Technologies Academy	
Zandbergen	Willem	University of Nevada, Reno	
	Andrew	University of Nevada, Reno	
	Braeden	University of Nevada, Reno	
	Brian	University of Nevada, Reno	
	Cameron	Homeschooled	
	Dylan	American Preparatory Academy	
	Finnick	University of Nevada, Las Vegas	
	Ivan	Western Governors University	
	Josh	College of Southern Nevada	
	Kaylee	Foothill High School	

## Strengths & Weaknesses

Strengths	
Headquarters Base	Moon Base
Binary	Loops
Open-source intelligence	Files
Linux	Sockets

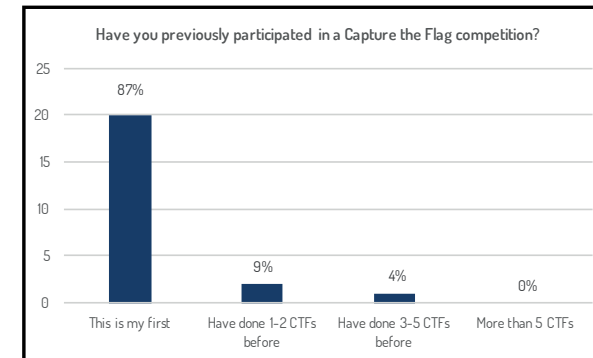
Weaknesses	
Headquarters Base	Moon Base
Forensics	Strings
Web application	Debugging
Cryptography	Functions

When looking into the types of challenges students in Nevada completed in CyberStart, we can see where their strengths and weaknesses lie. The above tables show that Nevada students were strongest at binary in the Headquarters Base and loops in the Moon Base.

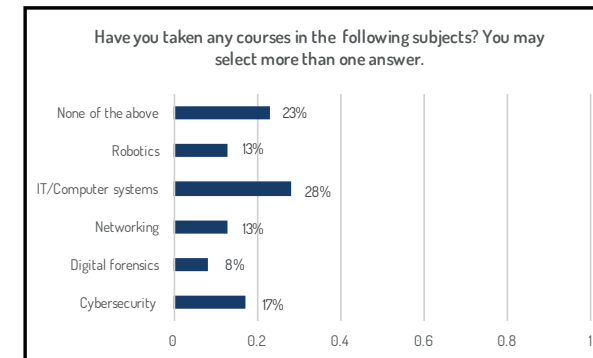
There are opportunities to further develop programming skills, such as strings and debugging, which were weaker in Nevada. The weakest topic in the Headquarters Base was forensics, however there are already some very developed capabilities that are applicable to security roles. Note that weaker areas do not imply under-achievement, merely that those areas provide opportunities to further develop.

## Student Feedback on Previous Knowledge

A survey sent to everyone who played the CyberStart game asked players for feedback on their previous knowledge, what they had learned, and what they enjoyed most about the program.



The results show that most students who played the CyberStart Game in Nevada had never been exposed to a Capture the Flag style teaching method. Furthermore, 23% of students had never taken any courses in relevant cybersecurity subject areas. Knowing this, it is encouraging that 52% of players made it through to the CyberStart Game.

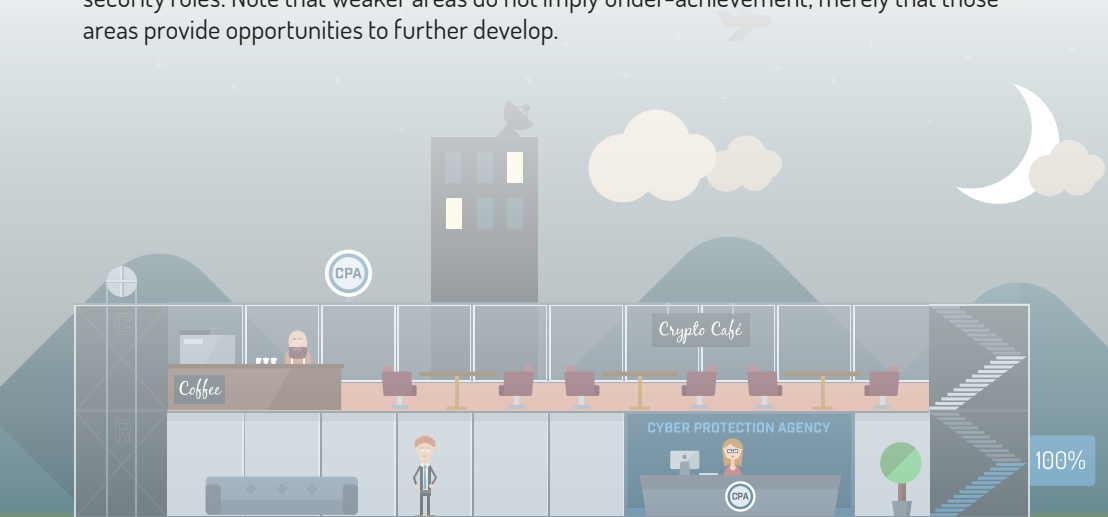


However, there were players from Nevada who had experience in other relevant cybersecurity subject areas – in particular computer systems. This showed that there is a strong group of students keen to build upon their existing knowledge. One of the benefits of CyberStart is that it engaged with this group and developed their interest in cybersecurity. This in turn is likely to accelerate their entry into the profession and fast-track Nevada's next generation of cybersecurity experts.

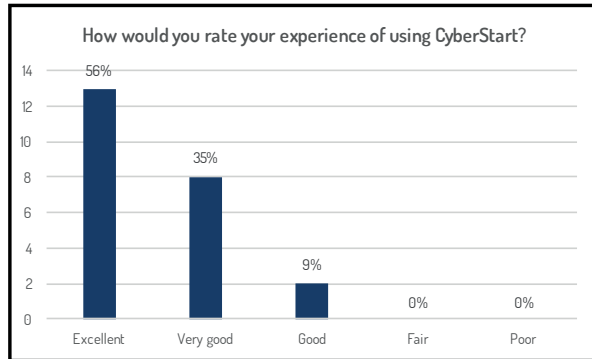
### Examples of Majors of CyberStart Participants:

- Computer science
- Computer science & engineering
- Engineering
- Networking
- Mechanical engineering
- Public health/hospitality

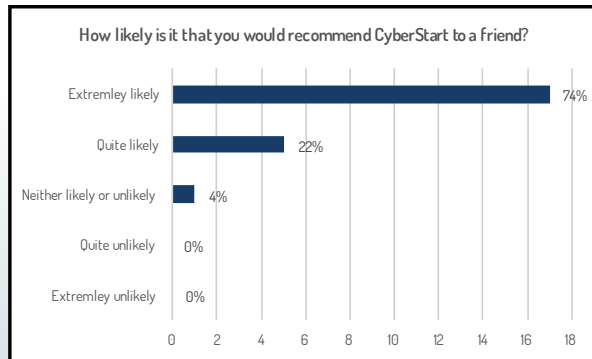
It is encouraging to see that students who had no previous experience were able to engage with the CyberStart tool and progress as well as students already interested in the industry and with a basic foundation of knowledge.



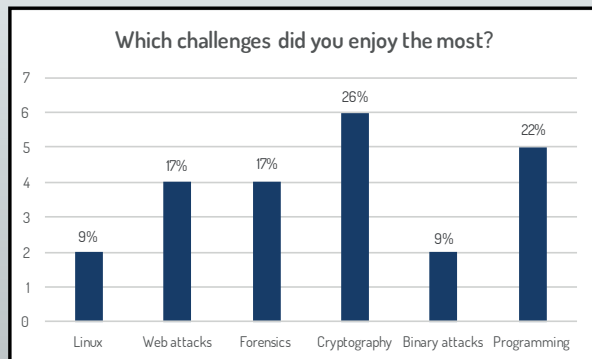
## Student Feedback on CyberStart



The response to the tool has shown that the training and teaching in CyberStart has engaged the instinctive ways people learn and identified those who naturally think like a cybersecurity practitioner. These encouraging results reflect the enormous success of the program in engaging with a variety of ages, genders and skill levels.

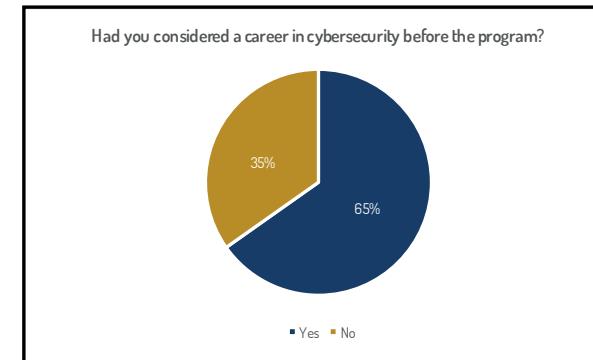


The students' response to the game has been exciting: 91% of students rated the game either "excellent" or "very good," and 96% said they would recommend the program to a friend. Not a single player rated the game "fair" or "poor" or said it was unlikely they would recommend it to a friend.

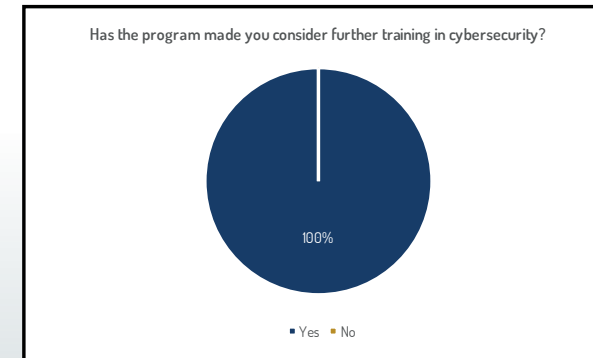


**Students in Nevada were most engaged with cryptography and programming challenges.**

## Student Feedback on Career Impact



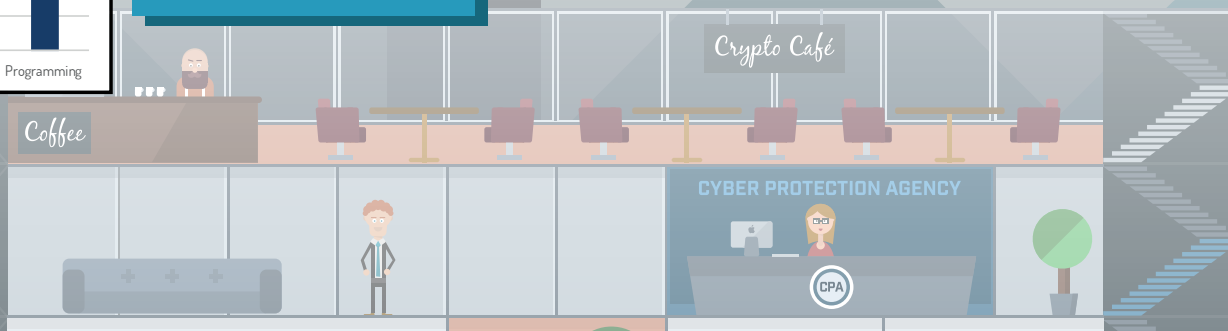
**100% of students who answered "no" to considering a career in cybersecurity in the past are now considering further training.**



The aim of the CyberStart program is to grow Nevada's cyber-capable workforce and promote cybersecurity as an exciting and recognized career. These graphs support our mission and present a group of young people who are now on the right path to a cybersecurity career.

Of the CyberStart participants in Nevada, 65% were already interested and engaged with the topic of cybersecurity. After working through the program, this number increased to 100% of students considering further training. This is encouraging when looking at the future of cybersecurity professionals in the state.

In addition, 35% of students had never considered a career in cybersecurity before playing the CyberStart Game. After completing challenges in a variety of cybersecurity disciplines, 100% of students are now considering further training in the area. This is an exciting program result that shows a real step change in reducing the skills gap in Nevada.





"Thank you for sponsoring this program. I truly enjoyed this competition. I give many thanks to the creators as it is apparent they spent many hours creating the website and challenges. I hope that this type of program becomes an annual event as it targets all skill levels in the topics of cybersecurity and programming. I and many of my peers who participated found the material to be not only educational but also engaging. I would love to see our state lead the way in cybersecurity education."

Jared Knutson, University of Nevada, Las Vegas, College Sophomore

"Thank you so much for sponsoring this program. I think it's great that you and the good people of the SANS Institute care so much about the state of the web and its security. Thank you also, for providing this opportunity to other young people and myself to learn what it means to keep the web safe, and teaching us how to do so through the CyberStart game. This is truly a great introduction on what cybersecurity really is and why it's so important to stay safe online. I have learned so much through this program, and love how it is setup as an entertaining game that gets the individual involved in the program."

Cameron, Homeschooled, Grade 12



"Thank you for giving myself and others the opportunity to learn about cybersecurity. The ability to train oneself in such an important skill set while also having a ton of fun doing it is extremely important. I already had a great interest in cybersecurity before discovering CyberStart. I'm sure that others who have had little exposure to this field have gained a new interest in cybersecurity and computer science in general. Please keep supporting initiatives like these."

Alexander Pasinski, University of Nevada, Reno, College Sophomore

"I think this program is really great, and is giving me a good idea of what to expect in real life scenarios of cyber security. I am even considering adding a compitia certification to my list called 'CSA+: Cybersecurity Analyst'. This is also showing me what I should be more focused on because I have been looking at every aspect of cyber security, but have been able to find what I need to focus on the most."

Casey Price, College of Southern Nevada, College Sophomore



"CyberStart has allowed me to get involved with testing my skills and putting my studies to the test. I appreciate being able to participate because it gives me a chance to use my skills I have been learning so diligently and put them to the test. The contest makes it even more exhilarating! Knowing there may be a prize at the end for completing all the challenges! I really love the program and I would absolutely love to get involved in any way I can as a volunteer or to help promote this in my local area. Anything I can do to help get more people passionate about cybersecurity, I'm in!"

Jett Chapman, Western Governors University, Graduate

## Contact Information:

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