TESTIMONY ON HB 1398
HOUSE EDUCATION COMMITTEE
By: Marisa Riesinger, Elementary Library Media Specialist
701-290-7732
Dickinson Public Schools

Mr. Chairman and Members of the Committee:

My name is Marisa Riesinger, and I am an elementary library media specialist for the Dickinson Public School district. I am here to speak in favor of House Bill 1398 regarding computer science and cybersecurity instruction for all students.

Most likely, we are all familiar with the growing statistics about the need for computer science related jobs. In fact, our students will be entering the workforce when computing jobs are the number one source of new wages (Code.org) with over 500,000 new jobs by 2028 (Bureau of Labor Statistics). North Dakota is no exception. In fact, ten-year career projections show an 18.1% increase for information technology jobs which is higher than all other career clusters in the state (ComputerScience.org, 2021). We must ask ourselves: How do we make sure North Dakota students are prepared to be successful? The answer: We must take collective responsibility to ensure North Dakota graduates are college and career ready whether they stay here or represent our state abroad, and this looks very different than it did even five years ago. Thus, guaranteed computer science and cybersecurity instruction must be in every school, in every grade level, and for every student.

Unfortunately, educators are already behind when children get to school. The National Center of Education Statistics reports nearly half of American three- and four-year-old children use the internet from their home – long before they use devices in school. Yet, most of their

caregivers lack the education and training to support their child's digital awareness and safety. This prioritizes the schools' need to be adaptive and responsive as they fulfill their role to prepare students to be responsible, ethical, and contributing members in a digitally literate society. We need to shift how we approach education because we are educating a future that is changing at an exponential rate.

In my school, we have prioritized computer science and cybersecurity education. Digital citizenship is an integrated part of library skills but also in content areas (e.g., math, social studies, science) as students use online resources, platforms, and tools to understand and complete learning goals. Students learn how to evaluate information, protect their passwords, establish a positive digital identity, and use strategies to use when they encounter online risks. In addition, we have introduced computer science from kindergarten on up through STEM activities, robotics, and "unplugged" activities [e.g., art, music, mapping, body movement (See Fig. 1)]. We have partnered with high school departments to bring Hour of Code to our students, community members to share their computer science/cybersecurity training and careers, and family nights to share what we are doing. Most importantly, we have come to realize that these concepts and skills are not isolated. They can - and must - be a layer of embedded instruction that lifts learning so students can acquire transferable skills apply in any situation.

Figure 1

Dancing teaches the computer science concepts of loops and sequences in a concrete way

In fact, computer science isn't about computers at all, but rather about a specific way of thinking. More importantly, it's "a set of skills that teachers can integrate into other academic areas, so students get a sense of how broadly applicable it is" (Valenzuela, 2020). However, students will not recognize this on their own, and educators need to be intentional about teaching it. In turn, we will help students be more intentional in their own lives and make deeper connections to their lives. Computer science encourages students to engage in real-world and personalized learning that keeps them intrinsically motivated, thoroughly engaged, and thinking at phenomenally high levels (PBS Education, 2018). In a sense, computer science is the foundation for all learning in school and beyond.

I have witnessed this during our schoolwide STEM days. Nearly four hundred K – 5 students rotate between various stations that include technology and "unplugged" activities. During this time, they create and collaborate with each other. They fail, and then they try again – and sometimes again and again. They design, engineer, and construct. They problem solve, persevere, innovate, and adapt. Most notably, *every* child fully engages, and not one behavior problem occurs. Students discover they can do things they never thought possible, and the more experiences students had with these opportunities, the more thoughtful, developed, innovative they became.

At this point, technology is not an optional component in schools. Although more districts are moving to personal devices, simply having devices does not guarantee computer science and cybersecurity education. Consequently, digital empowerment becomes an issue of digital disenfranchisement without sustained and intentional instruction. We cannot accept that it is a choice whether students receive this critical instruction especially considering the implications as digital space is where youth are spending an increasing portion of their lives. The

reality is children are developing more of their personal identity from online influences than ever before, and often without their knowledge. According to ParentCo. (2022), “children typically have a digital identity by the sixth month of their lives, although some may have one before they're even born including ultrasound images and other details. By the time they're old enough to sign up for their own accounts, they typically have about 2000 photos defining them online” (par. 8).

According to the International Journal of Child-Computer Interaction (2021), “risks have now become part of children’s everyday lives because they grow up immersed in technology to a degree that earlier generations would have found unimaginable” (p. 3). Our youth face issues such as privacy concerns, cyberbullying, content-related risks, internet addition, and stranger danger on a daily basis (See Fig. 2). In fact, about one in four youth will experience identity theft or fraud before the reach the age of 18 because of online privacy risks including geo-tagging, data surveillance, targeted advertisement, audio injection attacks, and eavesdroppers (See Fig. 3). And students’ digital sphere keeps growing with easy access and minimal knowledge of the risks and long-term consequences.

Figure 2

Cybersecurity Risks

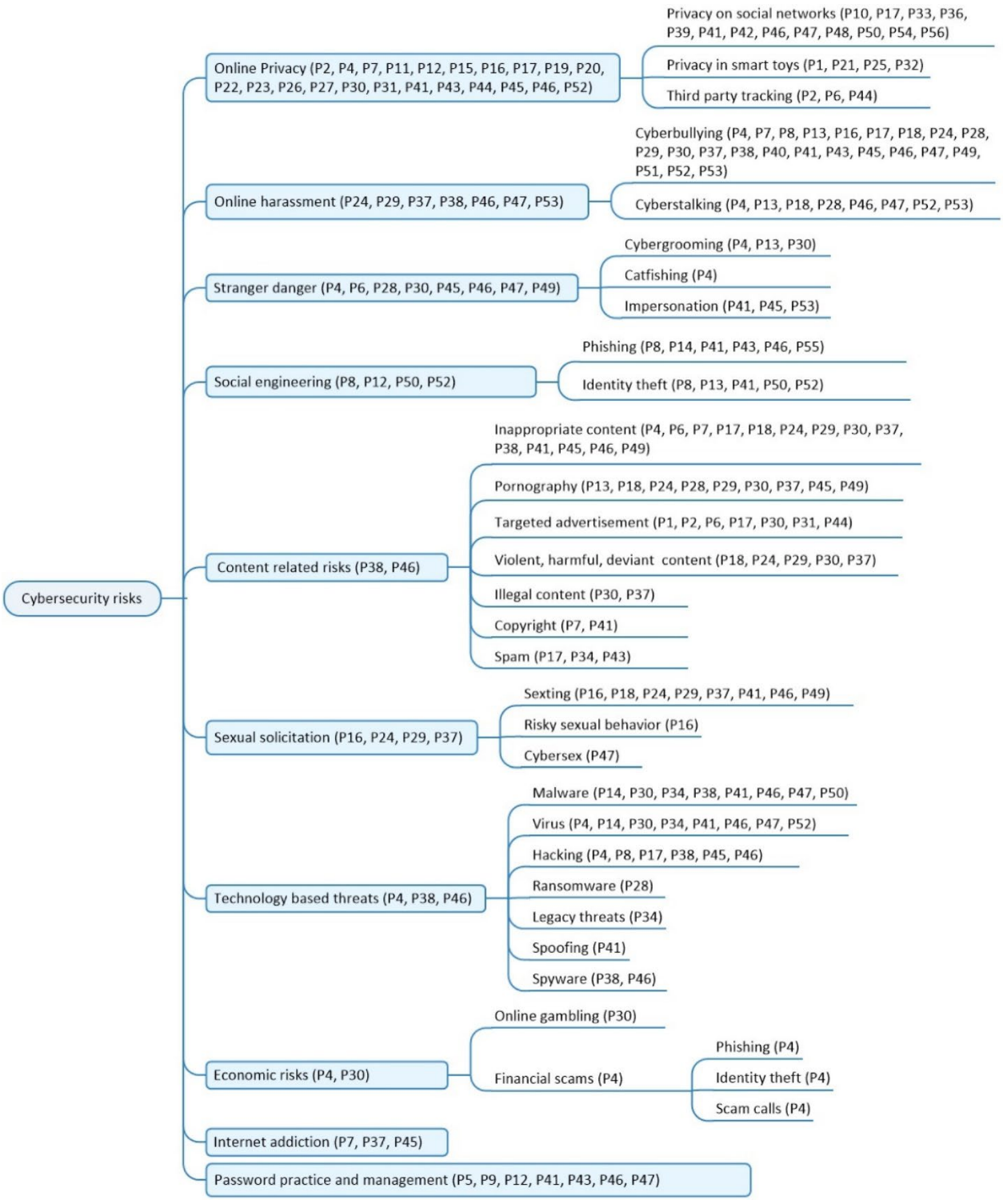
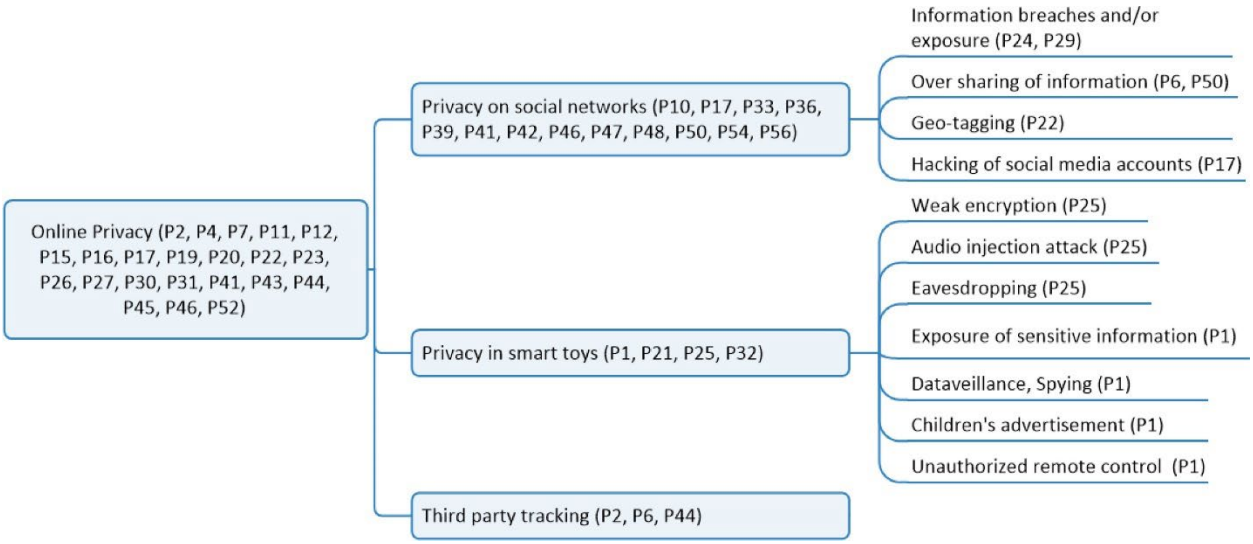

Cybersecurity risks
Online Privacy (P2, P4, P7, P11, P12, P15, P16, P17, P19, P20, P22, P23, P26, P27, P30, P31, P41, P43, P44, P45, P46, P52)
Privacy on social networks (P10, P17, P33, P36, P39, P41, P42, P46, P47, P48, P50, P54, P56)
Privacy in smart toys (P1, P21, P25, P32)
Third party tracking (P2, P6, P44)
Online harassment (P24, P29, P37, P38, P46, P47, P53)
Cyberbullying (P4, P7, P8, P13, P16, P17, P18, P24, P28, P29, P30, P37, P38, P40, P41, P43, P45, P46, P47, P49, P51, P52, P53)
Cyberstalking (P4, P13, P18, P28, P46, P47, P52, P53)
Stranger danger (P4, P6, P28, P30, P45, P46, P47, P49)
Cybergrooming (P4, P13, P30)
Catfishing (P4)
Impersonation (P41, P45, P53)
Social engineering (P8, P12, P50, P52)
Phishing (P8, P14, P41, P43, P46, P55)
Identity theft (P8, P13, P41, P50, P52)
Content related risks (P38, P46)
Inappropriate content (P4, P6, P7, P17, P18, P24, P29, P30, P37, P38, P41, P45, P46, P49)
Pornography (P13, P18, P24, P28, P29, P30, P37, P45, P49)
Targeted advertisement (P1, P2, P6, P17, P30, P31, P44)
Violent, harmful, deviant content (P18, P24, P29, P30, P37)
Illegal content (P30, P37)
Copyright (P7, P41)
Spam (P17, P34, P43)
Sexual solicitation (P16, P24, P29, P37)
Sexting (P16, P18, P24, P29, P37, P41, P46, P49)
Risky sexual behavior (P16)
Cybersex (P47)
Technology based threats (P4, P38, P46)
Malware (P14, P30, P34, P38, P41, P46, P47, P50)
Virus (P4, P14, P30, P34, P41, P46, P47, P52)
Hacking (P4, P8, P17, P38, P45, P46)
Ransomware (P28)
Legacy threats (P34)
Spoofing (P41)
Spyware (P38, P46)
Economic risks (P4, P30)
Online gambling (P30)
Financial scams (P4)
Phishing (P4)
Identity theft (P4)
Scam calls (P4)
Internet addiction (P7, P37, P45)
Password practice and management (P5, P9, P12, P41, P43, P46, P47)

Figure 3

Privacy-Related Risks



Fortunately, the increased use of online educational tools creates the opportunity for educators to simultaneously teach students basic cybersecurity skills and encourage them to be experts themselves. Just as we teach washing hands and covering a cough, we need to teach digital hygiene. Just as we teach safety for riding bike and crossing the street, we need to teach cybereducation. Research has shown that explicit cybersecurity instruction will increase children's privacy awareness, influence their online behavior, and heighten their cognition of risks and benefits using technology.

The duality of technology is undeniable. Because of technology, our children are faced with threats, but they are also met with limitless opportunities. Likewise, our attempts to keep students safe in the world do not transfer to the digital situations students encounter. Regardless of your personal thoughts about technology, the reality is, it is not going away. In fact, you if you grab your cell phone, you will be holding the oldest piece of technology that will ever be seen. Some may say, "But we always teach technology. After all, we do have computers in school."

Sometimes it is said to be the hidden curriculum just like critical thinking, problem solving, and analytical reasoning. However, we can no longer afford to keep computer science and cybersecurity hidden. Teachers recognize the need for it. Parents are asking for it. Our kids deserve it. We owe students our commitment to *guarantee* computer science and cybersecurity education.

Mr. Chairman and Members of the Committee, that concludes my prepared testimony, and I will stand for any questions that you may have.

ComputerScience.org. (2021, September 28). *Computer Science Programs in North Dakota*. https://www.computerscience.org/online-degrees/north-dakota/#:~:text=Computer%20Science%20Careers%20in%20North%20Dakota&text=Graduates%20pursue%20roles%20as%20computer,grow%2013%25%20nationally%20by%202026.

ParentCo., (2022, June). *How to help your child build and maintain a positive digital identity*. https://www.parent.com/blogs/conversations/how-to-help-your-child-build-and-maintain-a-positive-digital-identity.

PBS Education. (2018, November 29). *Five steps for integrating computer science in the classroom*. https://www.pbs.org/education/digitalinnovators.

Quayyum, F., Cruzes, D. S., & Jaccheri, L. (2021). Cybersecurity awareness for children: A systematic literature review. *International Journal of Child-Computer Interaction*, *30*(1), https://doi.org/10.1016/j.ijcci.2021.100343

Valenzuela, J. (2020, September 9). *3 ways to integrate computer science in other classes*. https://www.edutopia.org/article.