Learning that works for Washington
CTE™

EVERETT PUBLIC SCHOOLS CYBERSECURITY	
Course: Cybersecurity	**Total Framework Hours:** 180
CIP Code: 430116 ☐Exploratory ☒Preparatory	**Date Last Modified:** 05.2020
Career Cluster: Information Technology	**Cluster Pathway:** Network Systems

Industry Recognized Certificates:
List possible certificates students can earn in the course

Work-Based Learning:
List WBL opportunities provided in the course

Course Information:
This course introduces students to the ever-growing and far-reaching field of cybersecurity. Students accomplish this through problem-based learning in which students role-play and train as cybersecurity experts. The course gives students a broad exposure to the many aspects of digital and information security while encouraging socially responsible choices and ethical behavior. Students explore the educational and career paths available in cybersecurity and related fields.

ISTE Standards, WA State Learning Standards, NGSS

COMPONENTS AND ASSESSMENTS
Performance Assessments: • Students will demonstrate awareness of career pathways and the relationship of certifications to employability
Leadership Alignment: Students will research career pathways and industry recognized certifications in the cybersecurity field. 3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member. 4.A.1 Access information efficiently (time) and effectively (sources). 6.A.1 Use technology as a tool to research, organize, evaluate and communicate information.

Standards and Competencies	
Unit: IT Certifications and Career Pathways	
Unit Resources: WA STEM, Microsoft Certifications, National Initiative for Cybersecurity careers and studies	
Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 5
• Explore and identify potential career pathways, including career ladders.	
Aligned Washington State Learning Standards	
Educational Technology	3b. Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
English Language Arts	L.11-12.5 - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

	L.11-12.6 - Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression
	L.11-12.7 - Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem

COMPONENTS AND ASSESSMENTS

Performance Assessments:
- Students will research and present about an invasion of privacy.

Leadership Alignment:
Students will analyze the importance of ethical/legal issues surrounding cybersecurity while working independently and within teams.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems
3.A.1. Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts.
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams.
6.A.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies.

Standards and Competencies

Unit: Introduction to Cybersecurity

Industry Standards and/or Competencies	Total Learning Hours for Unit: 10

- Explain guidelines for cybersecurity, and sources of digital evidence
- Understand terminology and industry specific definitions as they relate to digital and multimedia evidence
- Understand ethical practices, approach, and its relation to privacy
- What are the requirements of professionals, privacy, confidentiality

Aligned Washington State Learning Standards

Computer Science	3B.DA.07 Evaluate the ability of models and simulations to test and support the refinement of hypotheses
Educational Technology	3.B. Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources 3.C. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions. 4.A. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
English Language Arts	L.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem L.W.11-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. L.R.I. 11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
Given a scenario, students will use software tools to assess the security an organization.
- Students will identify and explain threat actor types and attributes.
- Students will compare and contrast identity and access management, and penetration testing concepts.

Leadership Alignment:
Students will develop policy and procedure for safe learning and practice in the lab setting.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams.
4.A.2 Evaluate information critically and competently.
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information

Standards and Competencies	
Unit: Security Basics	

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 10

- Understanding Attacks, Defense Planning, Access Control, Network Monitoring, and Incident Response

Aligned Washington State Learning Standards	
Computer Science	3A-D-3-20 Discuss techniques used to store, process, and retrieve different amounts of information 3A-N-7-30 Describe key protocols and underlying processes of Internet-based services 3A-N-3-34 Use simple encryption and decryption algorithms to transmit/receive an encrypted message. 3B-A-7-4 Explain security issues that might lead to compromised computer programs.
Educational Technology	4.c. Students develop, test, and refine prototypes as part of a cyclical design process. 5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
English Language Arts	RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
- Students will explain the importance of policies, plans and procedures related to organizational security. Given a scenario, students identify data security and privacy practice, explain risk management processes and concepts and disaster recovery. Students will compare and contrast types of attacks, summarize secure application development and deployment concepts.

Leadership Alignment:
Students will develop intervention protocols to address security challenges by maintaining change logs and journaling security solutions.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.A.1 Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts.
4.B.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information.
10.B.1h Be accountable for results.

Standards and Competencies	
Unit: Problem Solving, Policies, Procedures, and Awareness	

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 15

- Security Policies
- Risk Management
- Manageable Network Plan
- App Development and Deployment
- Mobile Devices
- Third-Party Integration

Aligned Washington State Learning Standards	

Computer Science	3B-N-4-35 Simulate and discuss the issues that impact network functionality. S3B-D-1-28 Use various data collection techniques for different types of problems. 3B-A-7-4 Explain security issues that might lead to compromised computer programs.
Educational Technology	5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions. 6.c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations
English Language Arts	L.RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text WHST.11-12.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
- Students will compare and contrast physical security, environmental controls and types of attacks.

Leadership Alignment:
Students will direct security intervention teams to address a variety of simulated challenges.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises
4.B.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information.

Standards and Competencies

Unit: Physical Threat Landscape

Industry Standards and/or Competencies	Total Learning Hours for Unit: 10
- Physical Threats - Device Protection - Network Infrastructure Protection - Environmental Controls	

Aligned Washington State Learning Standards	
Computer Science	3B-N-4-35 Simulate and discuss the issues that impact network functionality. S3B-D-1-28 Use various data collection techniques for different types of problems. 3B-A-7-4 Explain security issues that might lead to compromised computer programs.
Educational Technology	5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions. 6.c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations
English Language Arts	L.11-12.6 Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text. WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
- Students will explain penetration testing concepts.
- Students will install and configure network components, both hardware and software-based, to support organizational security: Define username and password conventions and protocols, configure a firewall Create a DMZ Configure NAT Configure VPN, implement web threat protection
- Given a scenario, students will install and configure wireless security settings: ImplementWPA2 and configure enhanced security
- Students will apply MAC filtering and SSID cloaking
- Students will disable Network Discovery
- Students will configure: a GPO to enforce workstation/server security settings, domain GPO to enforce Windows Firewall use, and domain Servers GPO to remove unneeded services (such as file and printer sharing)
- Students will protect against spyware and unwanted software using Windows

Leadership Alignment:
Students will work in teams to prepare and present vulnerability awareness campaigns for individuals and entities
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.A.4 Utilize multiple media and technologies and know how to judge their effectiveness a priority as well as assess their impact.
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams.
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information.

Standards and Competencies

Unit: Perimeter Attacks and Defensive Strategies

Industry Standards and/or Competencies	Total Learning Hours for Unit: 25
- Recon and Denial - Spoofing and Poisoning - Security Appliances - Demilitarized Zones - Firewalls - Network Address Translation - Virtual Private Networks - Web Threat Protection - Network Access Protection - Wireless overview, attacks and defenses	

Aligned Washington State Learning Standards

Computer Science	3A-N-3-34 Use simple encryption and decryption algorithms to transmit/receive an encrypted message. 3B-N-4-35 Simulate and discuss the issues that impact network functionality. S3B-D-1-28Use various data collection techniques for different types of problems (e.g., mobile device, GPS, user surveys, embedded system sensors, open data sets, social media data sets). 3B-A-7-4 Explain security issues that might lead to compromised computer programs (e.g., circular references, ambiguous program calls, lack of error checking and field size checking).
Educational Technology	4.c. Students develop, test, and refine prototypes as part of a cyclical design process. 4.d. Students exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems. 5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions. 6.c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.

English Language Arts	L.11-12.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. RI.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matter uncertain. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
Given a scenario, students will use appropriate software tools to assess the security posture of an organization, cloud and virtualization concepts.
- Students will install and configure network components, both hardware and software-based to support organizational security.
- Students will explain the impact associated with types of vulnerabilities and scanning concepts
- Students will change the default username and password (and use secure passwords) on network devices, and implement port security
- Students will shut down unnecessary services and ports, remove unsecure protocols Implement access lists, and deny everything else
- Students will segment traffic using VLANs

Leadership Alignment:
Students will create a portfolio that will include strategies to deal with intrusion detection, prevention and present their research.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.A.1 Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts.
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams.
4.B.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information.
9.A.2 Conduct themselves in a respectable, professional manner.

Standards and Competencies

Unit: Network Intrusion Detection and Prevention & Penetration Testing

Industry Standards and/or Competencies	Total Learning Hours for Unit: 30
- Network threats, device vulnerabilities and applications - Switch Attacks and security - Using VLANs - Router Security - Intrusion Detection and Prevention - Vulnerability Assessment - Protocol Analyzers - Remote Access - Network Authentication - Penetration Testing - Virtual Networking - Software-Defined Networking (SDN) - Cloud Services Section - Wireless Defenses	

Aligned Washington State Learning Standards

Computer Science	3B-C-7-22 Explain the role of operating systems (e.g., how programs are stored in memory, how data is organized/retrieved, how processes are managed and multi-tasked). 3B-N-4-35 Simulate and discuss the issues that impact network functionality. S3B-D-1-28 Use various data collection techniques for different types of problems. 3B-A-7-4 Explain security issues that might lead to compromised computer programs.
Educational Technology	4.b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks 4.d. Students exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems. 5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions. 5.c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving 6.d. Students publish or present content that customizes the message and medium for their intended audiences.
English Language Arts	L.11-12.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
Given a scenario, students will analyze indicators of compromise and determine the type of malware and differentiate common account management practices.
- Students will configure: a GPO to enforce workstation/server security settings, Domain GPO to enforce Windows Firewall use, Domain Servers GPO to remove unneeded services (such as file and printer sharing), and NTFS permissions for secure file sharing
- Students will protect against spyware and unwanted software using Windows Defender

Leadership Alignment:
Students will build virtual machine images that include targeted security vulnerabilities. When the vulnerabilities are appropriately addressed, a scoring engine will award points.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.A.1 Articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts.
4.B.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information.
8.B.1 Monitor, define, prioritize, and complete tasks without direct oversight.

Standards and Competencies

Unit: Host Machine OS Hardening

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 30
• Malware • Password Attacks • Windows System Hardening • Hardening Enforcement • File Server Security • Linux Host Security	

- Embedded Systems
- Log Management
- Audits
- Email
- BYOD Security
- Mobile Device Management
- Host Virtualization

Aligned Washington State Learning Standards	
Computer Science	3B-C-7-22 Explain the role of operating systems (e.g., how programs are stored in memory, how data is organized/retrieved, how processes are managed and multi-tasked). 3B-N-4-35 Simulate and discuss the issues that impact network functionality. S3B-D-1-28 Use various data collection techniques for different types of problems. 3B-A-7-4 Explain security issues that might lead to compromised computer programs.
Educational Technology	4.c. Students develop, test and refine prototypes as part of a cyclical design process. 5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions. 6.c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations
English Language Arts	L.11-12.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text. WHST.11-12.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
Given a scenario, students will implement identity and access management controls.
- Students will create, rename, delete, and assign users and groups.
- Students will lock and unlock user accounts and change a user's password.
- Students will configure password aging and restrict use of local user accounts.

Leadership Alignment:
Students will work in teams to prepare and present awareness around the importance of password complexity and management.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal.
6.A.2 Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge economy
8.B.1 Monitor, define, prioritize, and complete tasks without direct oversight.

Standards and Competencies

Unit: Access Control Models and Managing Users and Groups in Windows and Linux

Industry Standards and/or Competencies	Total Learning Hours for Unit: 35
- Access Control Models - Authentication and authorization - Web Application Attacks - Internet Browsers - Application Development - Active Directory Overview - Windows Domain Users and Groups - Linux Users, groups, and user security - Group Policy Overview - Hardening Authentication	

Aligned Washington State Learning Standards	
Computer Science	3B-C-7-22 Explain the role of operating systems (e.g., how programs are stored in memory, how data is organized/retrieved, how processes are managed and multi-tasked). 3B-N-4-35 Simulate and discuss the issues (e.g., bandwidth, load, delay, topology) that impact network functionality (e.g., use free network simulators). S3B-D-1-28Use various data collection techniques for different types of problems (e.g., mobile device, GPS, user surveys, embedded system sensors, open data sets, social media data sets). 3B-A-7-4 Explain security issues that might lead to compromised computer
Educational Technology	4.b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. 5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions. 6.c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations
English Language Arts	L.11-12.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
Given a scenario, students will carry out the following data security and privacy practices:
- Encrypt Files with EFS and GPG
- Configure BitLocker with a TPM
- Manage certificates
- Configure a subordinate CA

- Use hashes
- Add SSL to a website
- Allow SSL connections
- Require IPsec for communications
- Implement RAID
- Configure fault-tolerant volumes
- Backup and restore a workstation and domain controller
- Restore server data from backup

Leadership Alignment:
Students will develop a backup and restoration methodology that they will implement in the lab setting.
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
3.A.1 Articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts.
4.B.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information.
6.A.1 Use technology as a tool to research, organize, evaluate, and communicate information.

Standards and Competencies

Unit: Encryption, Hashing, Redundancy, and Storage

Industry Standards and/or Competencies	**Total Learning Hours for Unit:** 10
- Data Management - Advanced Cryptography - Cryptography Implementations - Cryptographic Attacks - Symmetric Encryption - Asymmetric Encryption - File Encryption - Public Key Infrastructure - Hashing - Data Transmission Security - Data Loss Prevention - Redundancy - Backup and Restore • Cloud Storage	

Aligned Washington State Learning Standards	
Computer Science	3A-D-4-19 Analyze the representation tradeoffs among various forms of digital information (e.g., lossy versus lossless compression, encrypted vs. unencrypted, various image representations). 3A-N-3-34 Use simple encryption and decryption algorithms to transmit/receive an encrypted message. 3B-C-7-22 Explain the role of operating systems (e.g., how programs are stored in memory, how data is organized/retrieved, how processes are managed and multi-tasked). 3B-N-4-35 Simulate and discuss the issues (e.g., bandwidth, load, delay, topology) that impact network functionality 3B-A-7-4 Explain security issues that might lead to compromised computer programs (e.g., circular references, ambiguous program calls, lack of error checking and field size checking).
Educational Technology	4.b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. 5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

	5.c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving. 6.c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations
English Language Arts	L.RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text RI.11-12.3 Analyze a complex set of ideas or sequence WHST.11-12.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Science	HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

21st Century Skills
Check those that students will demonstrate in this course:

LEARNING & INNOVATION

Creativity and Innovation
☐ Think Creatively
☐ Work Creatively with Others
☐ Implement Innovations

Critical Thinking and Problem Solving
☐ Reason Effectively
☐ Use Systems Thinking
☐ Make Judgments and   Decisions
☐ Solve Problems

Communication and Collaboration
☐ Communicate Clearly
☐ Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS

Information Literacy
☐ Access and /evaluate Information
☐ Use and Manage Information

Media Literacy
☐ Analyze Media
☐ Create Media Products

Information, Communications and Technology (ICT Literacy)
☐ Apply Technology Effectively

LIFE & CAREER SKILLS

Flexibility and Adaptability
☐ Adapt to Change
☐ Be Flexible

Initiative and Self-Direction
☐ Manage Goals and Time
☐ Work Independently
☐ Be Self-Directed Learners

Social and Cross-Cultural
☐ Interact Effectively with Others
☐ Work Effectively in Diverse Teams

Productivity and Accountability
☐ Manage Projects
☐ Produce Results

Leadership and Responsibility
☐ Guide and Lead Others
☐ Be Responsible to Others