Cyber Security	
CURRICULUM/CONTENT AREA	COURSE LENGTH
Computer Science	*One Term*
GRADE LEVEL	DATE LAST REVIEWED
9 - 12	*2022*
PREREQUISITE(s) *if applicable*	BOARD APPROVAL DATE
None	*11/15/2022*
PRIMARY RESOURCE *if applicable*	

DESIRED RESULTS

COURSE DESCRIPTION AND PURPOSE

Cyber crimes against individuals, companies, and governments cost the United States over 6 billion dollars per year and are rising. Demand for cybersecurity professionals is at an all-time high. This course provides hands on experience to explore current cybersecurity topics such as: security principles, technologies and systems, procedures used to defend networks, and data. Knowledge, skills, and best practices for understanding cybercrime are essential for all future careers.

ENDURING UNDERSTANDINGS *Students will understand that...*	ESSENTIAL QUESTIONS *Students will keep considering...*
Creativity, innovation, and critical thinking are essential for success in a technologically advanced world.	Why is creativity and innovation important? How is creativity and innovation used in Computer Science?
	How do teams efficiently and effectively solve problems in an increasingly complex world?
	What strategies and processes can I use to become a more effective creator, thinker and problem solver?
The ability to communicate and collaborate with people with diverse backgrounds and perspectives is key to participation in a global economic society.	Why is communication and collaboration important? How do positive work behaviors and personal qualities impact communication and collaboration?
	What is effective teamwork? What strategies can I use/teams use to work better together? How can perspectives and experiences of a diverse group develop innovative solutions to a given problem?
Career and technical education provides pathways to high-demand, high-wage career opportunities, and personal fulfillment.	Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally?
	How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?
	What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?

PRIORITY CAREER & TECHNICAL STANDARDS

Students will be skilled at...

Creativity, Critical Thinking, Communication and Collaboration
4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.
a: I develop effective resolutions for a given problem, decision or opportunity using available information.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.

Career Development
CD4: Students will identify and apply employability skills.
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.
b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job.
c: I identify and exhibit traits for retaining employment.
d: I develop positive relationships with others.

Information, Media, Technology
IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.
a: I choose appropriate sources of data and information for a given purpose.
b: I determine the relevance, validity and timeliness of data and information.
c: I select relevant information necessary for making decisions and solving problems
d: I apply data and information to communicate ideas and create new opportunities.

PRIORITY CONTENT STANDARDS *Students will know...*	
Standard AP2: Students will create computational artifacts using algorithms and programming	
Potential INDUSTRY-RECOGNIZED CREDENTIALS (IRCs) Opportunties associated with the course	**Potential WORK BASED LEARNING (WBL) opportunities associated with the course**
Cisco Certifications (dpi certified)	
CertiPort	
Potential DUAL CREDIT Opportunties associated with the course	

Introduction to Cybersecurity and Digital Citzenship		
STAGE 1: Desired Unit Results Students will be able to: - Understand what it means to be a good digital citizen. - Understand cybersecurity and why its important. -Understand organization data and why it must be protected. - Understand types and motivations of cyber attackers.		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	Use test-cases to find errors or validate results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine code that would be used to complete code segments.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Describe the behavior and conditions that produce identified results in a program.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Determine the result or output based on statement execution order in a code segment.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
	CD4.a.10.h: I can manage work roles and responsibilities to balance them with other life roles and responsibilities.	Participate in a group discussion about the importance of time management.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
d: I develop positive relationships with others.	CD4.d.6.h: I can evaluate the best method to assist co-workers in accomplishing goals and tasks.	Determine team norms for communication and work completion.
	CD4.d.7.h: I can examine the skills required to enable students to successfully transition to postsecondary opportunities.	Research and list the top skills and traits needed to be successfull at the post secondary level.
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard IC1: Students will understand the impact and effect computing technology has on our everyday lives	I can debate the social and economic implications associated with ethical and unethical computing practices (e.g., intellectual property rights, hacktivism, software piracy, new computers shipped with malware).	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.
Standard IC3: Students will understand the importance of proper use of data and information in a computing society	I can debate laws and regulations that impact the development and use of software and be able to explain the main arguments from multiple perspectives.	Debate laws and regulations that impact the development and use of software.
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard DA1: Students will create computational artifacts using data and analysis	I can convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/ Unicode representation). I can analyze the representation tradeoffs among various forms of digital information (e.g., lossy vs. lossless compression, encrypted vs. unencrypted, various image representations). I can discuss how data sequences (e.g., binary, hexadecimal, octal) can be interpreted in a variety of forms (e.g., instructions, numbers, text, sound, image).	Use data analysis tools and techniques to identify patterns in data representing complex systems.
Stage 3: Learning Activities A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?		

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	STRATEGIES/ACTIVITIES What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	RESOURCES/MATERIALS This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
How do you become a good digital citizen?	Group and Class discussions of digital citizenship	Cisco Networking Academy - Intro
		Cisco Neworking Academy - Essentials
Why is cybersecurity essential in our world today?	Research, analyze, and present a past security breach.	Cyber Patriot Resources
What are the motivations of cyber criminals?	End of unit quiz.	Cisco Network Training
		Cyber Patriot Training

Computer System / Network Essentials		
STAGE 1: Desired Unit Results Students will be able to: - Understand the structure and function of computer systems - Understand the structure and funciton of a computer network - Understand and deploy a virtual machine		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	*Determine an appropriate program design to solve a problem or accomplish a task.*
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	*Determine if two or more code segments yield equivalent results.*
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	*Determine an appropriate program design to solve a problem or accomplish a task.*
	C2.a.16.h: I can defend an action taken or a decision implemented.	*Describe the behavior and conditions that produce identified results in a program.*
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	*Determine the result or output based on statement execution order in a code segment.*
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	*Describe the behavior and conditions that produce identified results in a program.*
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	*Arrive on-time to all classes and meetings.*
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	*Use electronic communication between teacher, team members, and mentors .*
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	*Organize and present collected data visually to highlight relationships and support a claim.*
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	*Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.*
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard DA1: Students will create computational artifacts using data and analysis	*I can convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/ Unicode representation).* *I can analyze the representation tradeoffs among various forms of digital information (e.g., lossy vs. lossless compression, encrypted vs. unencrypted, various image representations).* *I can discuss how data sequences (e.g., binary, hexadecimal, octal) can be interpreted in a variety of forms (e.g., instructions, numbers, text, sound, image).*	*Use data analysis tools and techniques to identify patterns in data representing complex systems.*
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
How does a computer system actually work?	Group and Class discussion	Cisco Networking Academy - Intro
	Build out a home network (using packet tracer)	Cisco Neworking Academy - Essentials
How does a digital network function?	Deploy a virtual machine	Cyber Patriot Resources
	End of unit quiz.	
Compare and contrast a virtual machine with a physical machine?		

UNIT 3: THREATS, VULNERABILITIES, ATTACKS		
STAGE 1: Desired Unit Results **What will students understand as a result of the unit?** - Understanding the most common cybersecurity attacks - Understanding cybercriminal infiltration tactics like deception. - Common methods used by cybercriminals. - Understanding wireless and mobile device. vulnerabilities and threats		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard DA1: Students will create computational artifacts using data and analysis	I can convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/ Unicode representation). I can analyze the representation tradeoffs among various forms of digital information (e.g., lossy vs. lossless compression, encrypted vs. unencrypted, various image representations). I can discuss how data sequences (e.g., binary, hexadecimal, octal) can be interpreted in a variety of forms (e.g., instructions, numbers, text, sound, image).	Use data analysis tools and techniques to identify patterns in data representing complex systems.
Standard IC1: Students will understand the impact and effect computing technology has on our everyday lives	I can debate the social and economic implications associated with ethical and unethical computing practices (e.g., intellectual property rights, hacktivism, software piracy, new computers shipped with malware).	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.
Standard IC3: Students will understand the importance of proper use of data and information in a computing society	I can debate laws and regulations that impact the development and use of software and be able to explain the main arguments from multiple perspectives.	Debate laws and regulations that impact the development and use of software.
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
enter supporting standards here, add more rows as needed	enter learning targets, add more rows as needed	
Stage 3: Learning Activities A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?		
GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.

How can you classify and analyze the different cyber security attacks that exist?	Group and Class discussion	Cisco Networking Academy - Intro
	Create a cybersecurity awareness poster.	Cisco Neworking Academy - Essentials
How do cyber criminals use deception techniques to steal information?	Lab - Install and use a virtual machine	Cyber Patriot Resources
	Lab - Using a port scanner to detect open ports	
Summarize the vulnerabilities exist with wireless and mobile devices	Lab - Build a homenetwork in packet tracer	
	Written responses to summarize understanding of topics.	
	End of unit quiz.	

Cybersecurity Principles, Process, and Practices		
STAGE 1: Desired Unit Results **What will students understand as a result of the unit?** - Understanding the three principles of information security - Understanding organizational data and why it must be protected - Understanding safeguards, training and standards that can protect against cyber attacks. - Authentication, authorization and accounting access methods. - Types of encryption and key management. - Preventing attacks using hash algorithms and salting		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
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	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	*Determine if two or more code segments yield equivalent results.*
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	*Use test-cases to find errors or validate results.*
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	*Determine code that would be used to complete code segments.*
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	*Determine an appropriate program design to solve a problem or accomplish a task.*
	C2.a.16.h: I can defend an action taken or a decision implemented.	*Describe the behavior and conditions that produce identified results in a program.*
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	*Determine the result or output based on statement execution order in a code segment.*
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	*Describe the behavior and conditions that produce identified results in a program.*
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	*Organize and present collected data visually to highlight relationships and support a claim.*
	IMT1.a.7.h: I can explain the level of objectivity for a given source of information.	*Collect data using computational tools.*
	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	*Organize and present collected data visually to highlight relationships and support a claim.*
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.7.h: I can use raw data and information appropriately to support an argument, idea or initiative.	*Determine an appropriate program design to solve a problem or accomplish a task.*
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	*Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.*
	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	*Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.*
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.5.h: I can defend a solution or conclusion using appropriate data and information.	*Use data analysis tools and techniques to identify patterns in data representing complex systems.*
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	*Collect data using computational tools and transform the data to make it more useful and reliable.*
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	*Evaluate the ability of models and simulations to test and support the refinement of hypotheses.*
	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	*Refine computational models based on the data they have generated.*
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	*Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.*
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*

Standard AP2: Students will create computational artifacts using algorithms and programming	*I can use user-centered research and design techniques (e.g., surveys, interviews) to create software solutions.* *I can integrate grade-level appropriate mathematical techniques, concepts, and processes in the creation of computational artifacts.* *I can use mathematical operations to change a value stored in a variable* *I can decompose a computational problem by creating new data types, functions, or classes.* *I can develop programs for multiple computing platforms (e.g., computer desktop, web, mobile).* *I can implement an Artificial Intelligence (AI) algorithm to play a game against a human opponent or solve a problem.* *I can demonstrate code reuse by creating programming solutions using libraries and application program interfaces (APIs) (e.g., graphics libraries, maps, API).*	*Write and implement a solution to a computational problem.*
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
Why are systems needed to secure information?	Group and Class discussion	Cisco Networking Academy - Intro
	Labs - In Packet Tracer	Cisco Neworking Academy - Essentials
Summarize processes to protect organizational data.	Labs - Linux Access Control, Cryptography	Cyber Patriot Resources
	Written responses to summarize understanding of topics.	
Justify safeguards and defenses that can prevent cyber attacks.	End of unit quiz.	

System and Network Defense		
STAGE 1: Desired Unit Results What will students understand as a result of the unit? - How to secure your systems and devices - Protecting and securing your applications - Securing network services and protocols - How to secure network devices - How to secure VPNs - Using segmentation to secure a network - Securing wireless and mobile devices .		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	Use test-cases to find errors or validate results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine code that would be used to complete code segments.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	Organize and present collected data visually to highlight relationships and support a claim.
	IMT1.a.7.h: I can explain the level of objectivity for a given source of information.	Collect data using computational tools.
	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.7.h: I can use raw data and information appropriately to support an argument, idea or initiative.	Determine an appropriate program design to solve a problem or accomplish a task.
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.
	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.5.h: I can defend a solution or conclusion using appropriate data and information.	Use data analysis tools and techniques to identify patterns in data representing complex systems.
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	Collect data using computational tools and transform the data to make it more useful and reliable.
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.
	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	Refine computational models based on the data they have generated.
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.

Standard AP2: Students will create computational artifacts using algorithms and programming	I can use user-centered research and design techniques (e.g., surveys, interviews) to create software solutions. I can integrate grade-level appropriate mathematical techniques, concepts, and processes in the creation of computational artifacts. I can use mathematical operations to change a value stored in a variable I can decompose a computational problem by creating new data types, functions, or classes. I can develop programs for multiple computing platforms (e.g., computer desktop, web, mobile). I can implement an Artificial Intelligence (AI) algorithm to play a game against a human opponent or solve a problem. I can demonstrate code reuse by creating programming solutions using libraries and application program interfaces (APIs) (e.g., graphics libraries, maps, API).	Write and implement a solution to a computational problem.
Standard IC3: Students will understand the importance of proper use of data and information in a computing society	I can debate laws and regulations that impact the development and use of software and be able to explain the main arguments from multiple perspectives.	Debate laws and regulations that impact the development and use of software.

Stage 3: Learning Activities

A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
Which methods can be used to secure systems,devices, and software?	Group and Class discussion	Cisco Networking Academy - Intro
	Labs - Linux: System hardening, password recovery	Cisco Neworking Academy - Essentials
What is importance of networking hardening?	Labs - Packet Tracer - Configuring VPNs, Configuring Wireless Routers	Cyber Patriot Resources
	Written responses to summarize understanding of topics.	
Summarize ways to defend against wireless and mobile devices.	End of unit quiz.	

Defending The Enterprise		
STAGE 1: Desired Unit Results **What will students understand as a result of the unit?** - Securing embedded and special systems. - Securing devices and networks on the public cloud. - Managing account permissions. - Using cryptography to secure networks, devices and data.		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	Use test-cases to find errors or validate results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine code that would be used to complete code segments.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	Organize and present collected data visually to highlight relationships and support a claim.
	IMT1.a.7.h: I can explain the level of objectivity for a given source of information.	Collect data using computational tools.
	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.7.h: I can use raw data and information appropriately to support an argument, idea or initiative.	Determine an appropriate program design to solve a problem or accomplish a task.
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.
	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.5.h: I can defend a solution or conclusion using appropriate data and information.	Use data analysis tools and techniques to identify patterns in data representing complex systems.
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	Collect data using computational tools and transform the data to make it more useful and reliable.
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.
	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	Refine computational models based on the data they have generated.
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.

Standard AP2: Students will create computational artifacts using algorithms and programming	I can use user-centered research and design techniques (e.g., surveys, interviews) to create software solutions. I can integrate grade-level appropriate mathematical techniques, concepts, and processes in the creation of computational artifacts. I can use mathematical operations to change a value stored in a variable I can decompose a computational problem by creating new data types, functions, or classes. I can develop programs for multiple computing platforms (e.g., computer desktop, web, mobile). I can implement an Artificial Intelligence (AI) algorithm to play a game against a human opponent or solve a problem. I can demonstrate code reuse by creating programming solutions using libraries and application program interfaces (APIs) (e.g., graphics libraries, maps, API).	Write and implement a solution to a computational problem.
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Stage 3: Learning Activities

A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
Why is it important to secure embedded systems?	Group and Class discussion	Cisco Networking Academy - Intro
	Labs - Packet Tracer: Configuring Site to site VPN	Cisco Neworking Academy - Essentials
What are similarities and differences to securing devices and networks from a cloud vs a local system?	Labs - Linux: Implementing Encryption, Generating Digital Signatures	Cyber Patriot Resources
	Written responses to summarize understanding of topics.	
How do you manage permissions?	End of unit quiz.	
Why is cryptography a beneficial tool for security?		

Cybersecurity Operations		
STAGE 1: Desired Unit Results **What will students understand as a result of the unit?** - Understand cybersecurity in defense in depth approach - Ensuring that systems remain securely implemented and configured - What physical security measures can help protect against cybercrime? - Identifying vulnerabilities and misconfigurations in security defenses - Designing high availability systems and how to maintain them - Attack frameworks for incident detection and response		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	Use test-cases to find errors or validate results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine code that would be used to complete code segments.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	Organize and present collected data visually to highlight relationships and support a claim.
	IMT1.a.7.h: I can explain the level of objectivity for a given source of information.	Collect data using computational tools.
	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.7.h: I can use raw data and information appropriately to support an argument, idea or initiative.	Determine an appropriate program design to solve a problem or accomplish a task.
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.
	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.5.h: I can defend a solution or conclusion using appropriate data and information.	Use data analysis tools and techniques to identify patterns in data representing complex systems.
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	Collect data using computational tools and transform the data to make it more useful and reliable.
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.
	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	Refine computational models based on the data they have generated.
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.

Standard AP2: Students will create computational artifacts using algorithms and programming	I can use user-centered research and design techniques (e.g., surveys, interviews) to create software solutions. I can integrate grade-level appropriate mathematical techniques, concepts, and processes in the creation of computational artifacts. I can use mathematical operations to change a value stored in a variable I can decompose a computational problem by creating new data types, functions, or classes. I can develop programs for multiple computing platforms (e.g., computer desktop, web, mobile). I can implement an Artificial Intelligence (AI) algorithm to play a game against a human opponent or solve a problem. I can demonstrate code reuse by creating programming solutions using libraries and application program interfaces (APIs) (e.g., graphics libraries, maps, API).	Write and implement a solution to a computational problem.

Stage 3: Learning Activities

A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
Why do organizations need a layered approach to security?	Group and Class discussion	Cisco Networking Academy - Intro
	Labs - Packet Tracer Using Diagnostic Commands, IoT security	Cisco Neworking Academy - Essentials
Why physical security measures can help prevent cyber crimes?	Labs - Use Wireshark to analyze network traffic	Cyber Patriot Resources
	Written responses to summarize understanding of topics.	Cyber.org
How can organizations manage and monitor cyber threats to prevent attacks?	End of unit quiz.	
What security assessments and tests can be done to expose vulnerabilities?		

Incident Response		
STAGE 1: Desired Unit Results **What will students understand as a result of the unit?** - Incident response plans and processes - Implementing disaster recovery and business continuity plans. - Investigating digital crime		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	Use test-cases to find errors or validate results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine code that would be used to complete code segments.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	Organize and present collected data visually to highlight relationships and support a claim.
	IMT1.a.7.h: I can explain the level of objectivity for a given source of information.	Collect data using computational tools.
	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.7.h: I can use raw data and information appropriately to support an argument, idea or initiative.	Determine an appropriate program design to solve a problem or accomplish a task.
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.
	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.5.h: I can defend a solution or conclusion using appropriate data and information.	Use data analysis tools and techniques to identify patterns in data representing complex systems.
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	Collect data using computational tools and transform the data to make it more useful and reliable.
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.
	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	Refine computational models based on the data they have generated.
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard DA1: Students will create computational artifacts using data and analysis	I can convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/ Unicode representation). I can analyze the representation tradeoffs among various forms of digital information (e.g., lossy vs. lossless compression, encrypted vs. unencrypted, various image representations). I can discuss how data sequences (e.g., binary, hexadecimal, octal) can be interpreted in a variety of forms (e.g., instructions, numbers, text, sound, image).	Use data analysis tools and techniques to identify patterns in data representing complex systems.

Stage 3: Learning Activities A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?		
GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
Why is it important to do deep analysis of incidents that have occured?	Group and Class discussion	Cisco Networking Academy - Intro
	Labs - Linux: Gather Information from attack	Cisco Neworking Academy - Essentials
What are the components of a good incident response plan?	Labs - Packet Tracer: Investigate Disaster Recovery	Cyber Patriot Resources
	Written responses to summarize understanding of topics.	
	End of unit quiz.	

Asset and Risk Management		
STAGE 1: Desired Unit Results What will students understand as a result of the unit? - Identifying assets that need to be protected though the asset lifecyble stages. - The risks and vulnerabilities that threaten and organization's assets - Using risk assessment to help assess and examine operation risks. - Types of controls that can be implemented to reduce and mitigate risk		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	Use test-cases to find errors or validate results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine code that would be used to complete code segments.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.6.h: I can evaluate how selfdiscipline, self-worth, positive attitude and integrity displayed in a work situation affect employment status.	Document a list of desired skills and traits local employers desire in their employees.
	CD4.a.7.h: I can assess how flexibility and willingness to learn new knowledge and skills affect employment status.	Interview a computer science profesional to learn about previous, current, and future learning required for their position.
	CD4.a.8.h: I can apply communication strategies when adapting to a culturally diverse environment.	Participate in a cross cultural discussion of computer science careers with students in another school district.
	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
	CD4.a.10.h: I can manage work roles and responsibilities to balance them with other life roles and responsibilities.	Participate in a group discussion about the importance of time management.
b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job.	CD4.b.5.h: I can use multiple resources to locate job opportunities.	Use multiple on-line resources to construct a list potential employement opportunities.
	CD4.b.6.h: I can prepare a resume, cover letter, employment application.	Produce a resume and review it with a hiring manager.
	CD4.b.7.h: I can employ critical thinking and decision-making skills to exhibit qualifications to a potential employer in an interview.	Participate in mock interviews with educators and community members.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
	CD4.c.5.h: I can maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite.	Document appropriate dress for computer science positions at local companies.
	CD4.c.6.h: I can complete required employment forms and documentation.	Complete an application for a local job opportunity.
	CD4.c.7.h: I can summarize key activities necessary to retain a job in an industry.	Create a prioritzed list of leadership qualities desired by local employers.
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	Participate in a job shadow.
	CD4.d.6.h: I can evaluate the best method to assist co-workers in accomplishing goals and tasks.	Determine team norms for communication and work completion.
	CD4.d.7.h: I can examine the skills required to enable students to successfully transition to postsecondary opportunities.	Research and list the top skills and traits needed to be successfull at the post secondary level.
	CD4.d.8.h: I can use a systematic approach to academic and career planning for students to achieve their learning, socio-cultural and work goals.	Create an academic and career plan with the help of parents, teachers, counselors, and mentors.
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	Organize and present collected data visually to highlight relationships and support a claim.

	IMT1.a.7.h: I can explain the level of objectivity for a given source of information.	Collect data using computational tools.
	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.7.h: I can use raw data and information appropriately to support an argument, idea or initiative.	Determine an appropriate program design to solve a problem or accomplish a task.
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.
	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.5.h: I can defend a solution or conclusion using appropriate data and information.	Use data analysis tools and techniques to identify patterns in data representing complex systems.
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	Collect data using computational tools and transform the data to make it more useful and reliable.
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.
	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	Refine computational models based on the data they have generated.
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard DA1: Students will create computational artifacts using data and analysis	"I can convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/ Unicode representation). I can analyze the representation tradeoffs among various forms of digital information (e.g., lossy vs. lossless compression, encrypted vs. unencrypted, various image representations). I can discuss how data sequences (e.g., binary, hexadecimal, octal) can be interpreted in a variety of forms (e.g., instructions, numbers, text, sound, image)."	Use data analysis tools and techniques to identify patterns in data representing complex systems.
Standard IC3: Students will understand the importance of proper use of data and information in a computing society	I can debate laws and regulations that impact the development and use of software and be able to explain the main arguments from multiple perspectives.	Debate laws and regulations that impact the development and use of software.
Stage 3: Learning Activities A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?		
GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
How do you identify and prioritize assets in an organization?	Group and Class discussion	Cisco Networking Academy - Intro
	Activities on Risk Management, Risk Analysis	Cisco Neworking Academy - Essentials
What are the risks and threats to an organizations assets?	Written responses to summarize understanding of topics.	Cyber Patriot Resources
	End of unit quiz.	
How can cyber professionals reduce and mitigate risks to its companies assets?		

Governance and Compliance		
STAGE 1: Desired Unit Results What will students understand as a result of the unit? - Understanding an organization's approach to cybersecurity. - The code of responsible digital behavior. - Understanding the ISO/IEC security model		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	Determine an appropriate program design to solve a problem or accomplish a task.
	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine code that would be used to complete code segments.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard AP2: Students will create computational artifacts using algorithms and programming	I can use user-centered research and design techniques (e.g., surveys, interviews) to create software solutions. I can integrate grade-level appropriate mathematical techniques, concepts, and processes in the creation of computational artifacts. I can use mathematical operations to change a value stored in a variable I can decompose a computational problem by creating new data types, functions, or classes. I can develop programs for multiple computing platforms (e.g., computer desktop, web, mobile). I can implement an Artificial Intelligence (AI) algorithm to play a game against a human opponent or solve a problem. I can demonstrate code reuse by creating programming solutions using libraries and application program interfaces (APIs) (e.g., graphics libraries, maps, API).	Write and implement a solution to a computational problem.
Standard DA1: Students will create computational artifacts using data and analysis	I can convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/ Unicode representation). I can analyze the representation tradeoffs among various forms of digital information (e.g., lossy vs. lossless compression, encrypted vs. unencrypted, various image representations). I can discuss how data sequences (e.g., binary, hexadecimal, octal) can be interpreted in a variety of forms (e.g., instructions, numbers, text, sound, image).	Use data analysis tools and techniques to identify patterns in data representing complex systems.
Standard IC1: Students will understand the impact and effect computing technology has on our everyday lives	I can debate the social and economic implications associated with ethical and unethical computing practices (e.g., intellectual property rights, hacktivism, software piracy, new computers shipped with malware).	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.
Standard IC3: Students will understand the importance of proper use of data and information in a computing society	I can debate laws and regulations that impact the development and use of software and be able to explain the main arguments from multiple perspectives.	Debate laws and regulations that impact the development and use of software.
Stage 3: Learning Activities A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?		

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	STRATEGIES/ACTIVITIES What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	RESOURCES/MATERIALS This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
Why is it important for organizations to communicate a code of ethics in dealing with cybersecurity?	Group and Class discussion	Cisco Networking Academy - Intro
	Project - Develop cybersecurity policies/procedures	Cisco Neworking Academy - Essentials
What are the ISO/IEC security models?	Lab - Packet Tracer: Skills integration challenge	Cyber Patriot Resources
	Written responses to summarize understanding of topics.	
What are good and bad digital behaviors?	End of unit quiz.	

Careers and Certification		
STAGE 1: Desired Unit Results What will students understand as a result of the unit? - Students will understand career pathways of cybersecurity - Students will have opportunities to complete a CISCO certification.		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
- Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally? - How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
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	4C2.a.12.h: I can contrast the benefits and drawbacks of various proposed resolutions to a given situation.	Determine if two or more code segments yield equivalent results.
	4C2.a.13.h: I can predict how an action could result in unintended consequences, both positive and negative.	Use test-cases to find errors or validate results.
	4C2.a.14.h: I can analyze the impact of a decision using a systems thinking model.	Determine code that would be used to complete code segments.
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	Determine an appropriate program design to solve a problem or accomplish a task.
	C2.a.16.h: I can defend an action taken or a decision implemented.	Describe the behavior and conditions that produce identified results in a program.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.5.h: I can apply past experience to develop a course of action for a new situation.	Determine the result or output based on statement execution order in a code segment.
	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	Describe the behavior and conditions that produce identified results in a program.
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.6.h: I can evaluate how selfdiscipline, self-worth, positive attitude and integrity displayed in a work situation affect employment status.	Document a list of desired skills and traits local employers desire in their employees.
	CD4.a.7.h: I can assess how flexibility and willingness to learn new knowledge and skills affect employment status.	Interview a computer science profesional to learn about previous, current, and future learning required for their position.
	CD4.a.8.h: I can apply communication strategies when adapting to a culturally diverse environment.	Participate in a cross cultural discussion of computer science careers with students in another school district.
	CD4.a.9.h: I can use positive workqualities typically desired in each of the career cluster's pathways.	Arrive on-time to all classes and meetings.
	CD4.a.10.h: I can manage work roles and responsibilities to balance them with other life roles and responsibilities.	Participate in a group discussion about the importance of time management.
b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job.	CD4.b.5.h: I can use multiple resources to locate job opportunities.	Use multiple on-line resources to construct a list potential employement opportunities.
	CD4.b.6.h: I can prepare a resume, cover letter, employment application.	Produce a resume and review it with a hiring manager.
	CD4.b.7.h: I can employ critical thinking and decision-making skills to exhibit qualifications to a potential employer in an interview.	Participate in mock interviews with educators and community members.
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	Use electronic communication between teacher, team members, and mentors .
	CD4.c.5.h: I can maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite.	Document appropriate dress for computer science positions at local companies.
	CD4.c.6.h: I can complete required employment forms and documentation.	Complete an application for a local job opportunity.
	CD4.c.7.h: I can summarize key activities necessary to retain a job in an industry.	Create a prioritzed list of leadership qualities desired by local employers.
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	Participate in a job shadow.
	CD4.d.7.h: I can examine the skills required to enable students to successfully transition to postsecondary opportunities.	Research and list the top skills and traits needed to be successfull at the post secondary level.
	CD4.d.8.h: I can use a systematic approach to academic and career planning for students to achieve their learning, socio-cultural and work goals.	Create an academic and career plan with the help of parents, teachers, counselors, and mentors.
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	Organize and present collected data visually to highlight relationships and support a claim.
	IMT1.a.7.h: I can explain the level of objectivity for a given source of information.	Collect data using computational tools.

	IMT1.a.8.h: I can model how raw data can be applied differently to support opposing arguments or premises.	Organize and present collected data visually to highlight relationships and support a claim.
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.7.h: I can use raw data and information appropriately to support an argument, idea or initiative.	Determine an appropriate program design to solve a problem or accomplish a task.
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.
	IMT1.b.9.h: I can defend a position or decision using relevant, valid and timely data and information.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.5.h: I can defend a solution or conclusion using appropriate data and information.	Use data analysis tools and techniques to identify patterns in data representing complex systems.
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	Collect data using computational tools and transform the data to make it more useful and reliable.
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.
	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	Refine computational models based on the data they have generated.
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard AP2: Students will create computational artifacts using algorithms and programming	I can use user-centered research and design techniques (e.g., surveys, interviews) to create software solutions. I can integrate grade-level appropriate mathematical techniques, concepts, and processes in the creation of computational artifacts. I can use mathematical operations to change a value stored in a variable I can decompose a computational problem by creating new data types, functions, or classes. I can develop programs for multiple computing platforms (e.g., computer desktop, web, mobile). I can implement an Artificial Intelligence (AI) algorithm to play a game against a human opponent or solve a problem. I can demonstrate code reuse by creating programming solutions using libraries and application program interfaces (APIs) (e.g., graphics libraries, maps, API).	Write and implement a solution to a computational problem.
Standard DA1: Students will create computational artifacts using data and analysis	I can convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/ Unicode representation). I can analyze the representation tradeoffs among various forms of digital information (e.g., lossy vs. lossless compression, encrypted vs. unencrypted, various image representations). I can discuss how data sequences (e.g., binary, hexadecimal, octal) can be interpreted in a variety of forms (e.g., instructions, numbers, text, sound, image).	Use data analysis tools and techniques to identify patterns in data representing complex systems.
Standard IC1: Students will understand the impact and effect computing technology has on our everyday lives	I can debate the social and economic implications associated with ethical and unethical computing practices (e.g., intellectual property rights, hacktivism, software piracy, new computers shipped with malware).	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.
Standard IC3: Students will understand the importance of proper use of data and information in a computing society	I can debate laws and regulations that impact the development and use of software and be able to explain the main arguments from multiple perspectives.	Debate laws and regulations that impact the development and use of software.
Stage 3: Learning Activities A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?		
GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
What careers are available to a cybersecurity expert?	Group and Class discussion	Cisco Networking Academy - Intro
	Project - Investigate and present career paths in cybersecurity	Cisco Neworking Academy - Essentials
What certifications can I receive through CISCO?	Take CISCO certification	Cyber Patriot Resources

Priority Standards	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.** a: I develop effective resolutions for a given problem, decision or opportunity using available information. b: I develop and implement a resolution for a new situation using personal knowledge and experience.	X	X	X	X	X	X	X	X	X	X	X
Career Development **CD4: Students will identify and apply employability skills.** a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable. b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job. c: I identify and exhibit traits for retaining employment. d: I develop positive relationships with others.	X	X	X	X	X	X	X	X	X	X	X
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.** a: I choose appropriate sources of data and information for a given purpose. b: I determine the relevance, validity and timeliness of data and information. c: I select relevant information necessary for making decisions and solving problems d: I apply data and information to communicate ideas and create new opportunities.	X	X	X	X	X	X	X	X	X	X	X
Standard AP2: Students will create computational artifacts using algorithms and programming				X	X	X	X			X	X
Standard DA1: Students will create computational artifacts using data and analysis	X	X	X					X	X	X	X
Standard IC1: Students will understand the impact and effect computing technology has on our everyday lives	X		X							X	X
Standard IC3: Students will understand the importance of proper use of data and information in a computing society	X		X		X	X			X	X	X