

# Unit 7: Performance Tasks

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**AP Computer Science Principles, Unit 7 Performance Tasks**

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**Department of Curriculum and Instruction**



**Belleville Public Schools**

**Curriculum Guide**

**AP Computer Science Principles, 9-12 High School**

**Performance Tasks**

**Belleville Board of Education**

**56 Ralph Street**

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Board Approved:

**Unit Overview**

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Investigative Task, Create Task and prepare for advanced placement exam for College Board.

## **Enduring Understanding**

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- The results and artifacts of computation and the computational techniques and strategies that generate them can be understood intrinsically both for what they are as well as for what they produce.
- Creativity and computing are prominent forces in innovation; the innovations enabled by computing have had and will continue to have far-reaching impact.

## **Essential Questions**

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- Can a creative development process affect the creation of computational artifacts?
- Does computing enhance human communication, interaction, and cognition?
- Can computing enable innovation?

## **Exit Skills**

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Exploration and Research:

- Investigate a computing innovation that has had a significant impact on society, economy, or culture.
- Produce a computational artifact that describes the intended purpose and function of the computing innovation and demonstrates how it fulfills that purpose.
- Document the development process, tools, and techniques used in creating the computational artifact.
- Analyze the beneficial and harmful effects of the computing innovation on society, economy, or culture.
- Identify and discuss how the computing innovation consumes, produces, and/or transforms data and address concerns about data storage, data privacy, or data security..
- Design, research, and create a computational artifact.

Creative Development:

- Design, implement, and test a program that solves a problem of personal interest to the student.
- Summarize, describe, and reflect on the development process of the program.
- Create a video demonstrating the use and functionality of the program.

## **New Jersey Student Learning Standards (NJSL-S)**

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CS.9-12.8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.
CS.9-12.8.1.12.CS.2	Model interactions between application software, system software, and hardware.
CS.9-12.8.1.12.CS.3	Compare the functions of application software, system software, and hardware.
CS.9-12.CS	Computing Systems
TECH.9.4.12.CI	Creativity and Innovation
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.CT.3	Enlist input from a variety of stakeholders (e.g., community members, experts in the field) to design a service learning activity that addresses a local or global issue (e.g., environmental justice).
TECH.9.4.12.CT.4	<p>Participate in online strategy and planning sessions for course-based, school-based, or other project and determine the strategies that contribute to effective outcomes.</p> <p>Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.</p> <p>With a growth mindset, failure is an important part of success.</p> <p>The usability, dependability, security, and accessibility of devices within integrated systems are important considerations in their design as they evolve.</p> <p>Innovative ideas or innovation can lead to career opportunities.</p> <p>Successful troubleshooting of complex problems involves multiple approaches including research, analysis, reflection, interaction with peers, and drawing on past experiences.</p> <p>Network connectivity and computing capability extended to objects, sensors and everyday items not normally considered computers allows these devices to generate, exchange, and consume data with minimal human intervention. Technologies such as Artificial Intelligence (AI) and blockchain can help minimize the effect of climate change.</p>

## **Interdisciplinary Connections**

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LA.RL.11-12	Reading Literature
	Key Ideas and Details

LA.RL.11-12.1	Cite strong and thorough textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
LA.RL.11-12.2	Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.
LA.RL.11-12.3	Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).
LA.L.11-12.4.A	Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
LA.L.11-12.4.B	Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).
LA.L.11-12.4.C	Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.
LA.L.11-12.4.D	Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

## Learning Objectives

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### *Exploration and Research:*

1. Investigate a computing innovation that has had a significant impact on society, economy, or culture.
2. Produce a computational artifact that describes the intended purpose and function of the computing innovation and demonstrates how it fulfills that purpose.
3. Document the development process, tools, and techniques used in creating the computational artifact.
4. Analyze the beneficial and harmful effects of the computing innovation on society, economy, or culture.
5. Identify and discuss how the computing innovation consumes, produces, and/or transforms data and address concerns about data storage, data privacy, or data security..
6. Design, research, and create a computational artifact.

### *Creative Development:*

1. Design, implement, and test a program that solves a problem of personal interest to the student.
2. Summarize, describe, and reflect on the development process of the program.
3. Create a video demonstrating the use and functionality of the program.

## Suggested Activities & Best Practices

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- Edhesive and Code Studio Labs
- Teacher demonstration with hands on practice
- Discussion Boards on chapter of blown to bits. Using the course sites platform

- Collaborate with a peer to find a solution to a text compression problem using the Text Compression Widget (lossless compression scheme).
- Develop a strategy (heuristic algorithm) for compressing text.
- Use the Pixelation Tool to encode small color images with varying bits-per-pixel settings.
- Identify and construct a document using reliable sources of information when doing research
- Create an artifact (video, image, slide, poster, etc.) to communicate information about a computing topic.
- Lectures
- Powerpoint/ Prezi Presentations

## **Assessment Evidence - Checking for Understanding (CFU)**

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### Formative Assessments

- Think, pair, share review questions from text.
- Practice mini-programs to strengthen concepts as taught.
- Teacher Observation
- Utilizing Gliffy.com to flowchart programs

### Summative Assessments

- Chapter Test
- End of Chapter Projects from book.

### Alternate Assessment

- \* Multimedia reports

### Benchmark Assessments

- \* Create an artifact (video, image, slide, poster, etc.) to communicate information about a computing topic.

- Admit Tickets
- Anticipation Guide
- Common Benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests
- Web-Based Assessments
- Written Reports

## Ancillary Resources

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### General Resources:

- Computers and Internet Access
- AP Central at Collegeboard.org
- Massive Open Online Course
- Code.org
- Multimedia Applications Tools
- Abelson, H., Ledeen, K., and Lewis, H. R. Blown to Bits: your life, liberty, and happiness after the digital explosion. Upper Saddle River, N.J.: Addison-Wesley, 2008.

### AP Approved Programming Resources:

(may choose one or more)

- Alice - This 3-D modeling environment allows students to create and animate 3-D worlds. This environment lends itself well to creating stories and games.
- App Inventor - This open-source Web application allows students to create their own applications on mobile devices. App Lab - This is a programming environment for creating web applications with JavaScript. It allows students to develop programs and toggle back and forth between block-based and text-based programming modes.
- EarSketch - This browser-based application allows students to create their own music using either JavaScript or Python. Greenfoot - This Java IDE is designed for use in education to create two-dimensional graphic applications, such as simulations and interactive games.
- Java - There are several IDEs that can be used to write in Java. The Java language allows students to create and solve problems that vary widely in difficulty.
- JavaScript - This language is commonly used to create interactive effects within Web browsers.
- Lego Mindstorms NXT - This product integrates programming with Lego bricks and sensors to create and program robots. The instructions are assembled by linking together function blocks.
- Processing - This programming language was initially created to serve as a software sketchbook, and it can be used to teach programming using a visual context.
- Python - This language has the benefit of readability that might be helpful to new programmers.
- Scratch - This blocks-based programming language allows students to build scripts to run animations. This product can be downloaded and installed on a computer or run in the browser.
- Snap! - This Scratch-style programming language is block-based and allows users to define new primitives in JavaScript. Users can read and write information from the Internet using server-defined APIs and make mobile applications.
- Swift - This programming language is designed for use with iOS, OS X, tvOS and watchOS. This environment allows students to create their own Apple apps and includes interactive environments that allow students to see the effects of changes or additions to code as they type.
- Design and Development Process:

- “What Is the Software Development Life Cycle?” Official Blog Airbrake Bug Tracker.  
<https://airbrake.io/blog/insight/what-is-the-software-development-life-cycle>
- “Engineering Design Process.” [https://www.teachengineering.org/ engrdesignprocess.php](https://www.teachengineering.org/engrdesignprocess.php)
- “The Engineering Design Process.” <http://www.eie.org/overview/engineeringdesign-process>  
Mohammed, Nabil, Ali Munassar, and A. Govardhan.
- “A Comparison Between Five Models of Software Engineering.” IJCSI International Journal of Computer Science 7.5 (2010): 94-101.

## **Technology Infusion**

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Please reference video links and websites listed under Ancillary Resources and Suggested Activities & Best Practices.

Technology Infusion and/or strategies include chromebooks online materials google/powerpoint slides



## Alignment to 21st Century Skills & Technology

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WRK.9.2.12.CAP	Career Awareness and Planning
WRK.9.2.12.CAP.1	Analyze unemployment rates for workers with different levels of education and how the economic, social, and political conditions of a time period are affected by a recession.
WRK.9.2.12.CAP.2	Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.4	Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
TECH.9.4.12.CI	Creativity and Innovation
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).  There are strategies to improve one's professional value and marketability.  Network connectivity and computing capability extended to objects, sensors and everyday items not normally considered computers allows these devices to generate, exchange, and consume data with minimal human intervention. Technologies such as Artificial Intelligence (AI) and blockchain can help minimize the effect of climate change.  Innovative ideas or innovation can lead to career opportunities.  Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.  With a growth mindset, failure is an important part of success.

## 21st Century Skills/Interdisciplinary Themes

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21st Century/Interdisciplinary Themes that will be incorporated in this unit.

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

9-12.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
9-12.HS-ETS1-2.6.1	Design a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.
9-12.HS-ETS1-1.ETS1.A.2	Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges also may have manifestations in local communities.

## **21st Century Skills**

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**21st Century Skills** that will be incorporated in this unit.

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.  Graphing utilities, spreadsheets, computer algebra systems, and dynamic geometry software are powerful tools that can be used to model purely mathematical phenomena (e.g., the behavior of polynomials) as well as physical phenomena.

## **Differentiation**

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### **Exemplars:**

#### Differentiation

Meeting with small groups to re-teach an idea or skill for struggling learners, or to extend the thinking or skills of advanced learners.

- Varying the length of time a student may take to complete a task in order to provide additional support for a struggling learner or to encourage an advanced learner to pursue a topic in greater depth.

Using rubrics that match and extend students' varied skills levels;

Helping students understand that some learners need to move around to learn, while others do better sitting quietly (Tomlinson, 1995, 1999; Winebrenner, 1992, 1996).

**Differentiations:**

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

**Hi-Prep Differentiations:**

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning

- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

#### **Lo-Prep Differentiations**

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

## **Special Education Learning (IEP's & 504's)**

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Exemplars:

IEP:

1. Adherence to the students' Individualized Learning Plan.
2. Students will have extra time or fewer assignments, one-to-one assistance, and group work will often be enlisted.
3. Students may use speech-to-text or audio/video record assignments
4. Teacher may adapt learning style to fit the needs of the child.
5. Teacher will use graphic organizer to visually help students plan out their work.
6. The teacher will scaffold the lesson with a slow release from assisted support with guided practice to independent practice.
7. Front-loaded notes to enable students to more accurately follow along with teacher's instruction.

8. Step-by-step directions written out for students.

504:

1. Any necessary accommodations will be made as outlined in students' 504 plan.
2. Preferential seating while teacher is lecturing, explaining, etc.
3. Extended time on projects or assessments.
4. Verbal, visual or technology aids.
5. Use of digital audio-visual materials, such as YouTube, to assist the child with directions.

Adapting existing materials, simplifying or supplementing materials for Special Education Learning other options are below.

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- **Provide** alternatives for responding to questions.
- **Rewrite** brief sections to lower the reading level.
- **Outline** the material for the student before reading a selection.
- **Reduce** the number of pages or items on a page to be completed by the student.
- **Break** tasks into smaller subtasks.
- **Provide** additional practice to ensure mastery.
- **Substitute** a similar, less complex task for a particular assignment.
- **Develop** simple study guides to complement required materials.

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes

- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

## **English Language Learning (ELL)**

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### **Exemplars: Extended Time**

It's obvious that response time for ELLs is significantly greater than it is for students proficient in English. Given this, we know that ELLs may require more [time](#) to process and communicate information on assessments. To support your students in this area, give them additional time on tests to help. Extra time will also help to decrease anxiety, which often has a significant impact on test performance.

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarify
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;

- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of work presented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

## At Risk

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### Exemplar: Contracts

It helps to have a [working contract](#) between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day, write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs. You may wish to have reward systems in place also.

Intervention Strategies that will be employed in the unit, using the ones identified below.

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of work presented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving

- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

## **Talented and Gifted Learning (T&G)**

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Exemplars:

Ask students' higher level questions that require students to look into causes, experiences, and facts to draw a conclusion or make connections to other areas of learning. • If possible, compact curriculum to allow gifted students to move more quickly through the material. • Encourage students to make transformations- use a common task or item in a different way.

[http://www.grandviewlibrary.org/CurriculumAdaptations/General\\_Gifted.pdf](http://www.grandviewlibrary.org/CurriculumAdaptations/General_Gifted.pdf)

Grouping • Group gifted students with other gifted students or higher-level learners. • Refrain from grouping gifted students with lower-level students for remediation.

**Talented and Gifted** adaptations that will be employed in the unit, using the ones identified below.

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge

## **Sample Lesson**

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<https://docs.google.com/presentation/d/174nHpIilMIvy5kcnB-jQ6Ai9rajnUtBrSfNObOKHCK/edit?usp=sharing>

<https://emedia.uen.org/courses/cs-principles-2019-2020-7-2-create-pt-make-a-plan/view>

**Unit Name:** Lesson 1: Create PT - Review the Task

**CCSS/NJCCCS:** [Linked](#)

**Interdisciplinary Connection:** Math and Financial Measuring skills, Reading information, vocabulary Critical Thinking and addition and subtraction in computer problems.

**Statement of Objective:** Students will be able to

- Describe the major components of the Create PT
- Describe how the Create PT Scoring Guidelines will be used to assess the task
- Evaluate sample Create PT submissions by applying the scoring guidelines
- Identify remaining questions about the Create PT

**Anticipatory Set/Do Now:**

Remarks -

This lesson contains a series of activities you can use to help students familiarize themselves with Create Performance Task, how it is scored, and some example tasks provided by the College Board.

Students review the Submission Requirements and Scoring Guidelines for the Create PT. Subsequently they review three example scored Create PT submissions with commentary to better understand how the Submission Requirements and Scoring Guidelines are used together. In a wrap-up conversation they identify a piece of advice, a "gotcha", and a remaining question they have about the Create PT.

Note: Much the sample tasks, scores, and commentary on scoring shared in this lesson come directly from the College Board. Code.org's commentary is noted where applicable.

**Learning Activity:**

- [Review the Task](#)
- [Introduce the Create PT](#)
- [Review Create PT Submission Requirements and Scoring Guidelines](#)
- [Review Scoring Guidelines and Sample Tasks](#)
- [Create PT Sample Response C 2017](#)
- [Create PT Annotated Sample C 2017 \(score: 7/8\)](#)
- [Create PT Annotated Samples F 2018 \(5/8\), I 2018 \(3/8\), and J 2018 \(1/8\)](#)
- [Optional - Review Grumpy Cat Exemplar Create PT](#)
- [Wrap Up](#)
- [Create PT: Advice, Gotchas, Questions](#)
- [\(Optional\) AP Digital Portfolio Setup](#)
- [Tech Setup - AP Digital Portfolio, Making PDFs, and Videos](#)

**Student Assessment/CFU's:** 2. Hand signals and 9. Observation

**Materials:** Text Book, Handouts, Smart Board and Computers

**21st Century Themes and Skills:** [Linked](#)

**Differentiation:**Above - Higher tiered questioning and work sheets,peer teaching Students will score 90% or above

On - On target questioning students will score 80% or above

Below - Basic questioning, teacher assisted practice, misconception checks students will score 75% or above

**Integration of Technology:** Computers used for research as well as formatting of documents and production of reports and the Smart TV is used for demonstration of document formation and report production.

**Unit Name:** Create Task / Answer Questions and Submit to AP Site

**CCSS/NJCCCS:** Linked

**Interdisciplinary Connection:** Math and Financial Measuring skills, Reading information, vocabulary Critical Thinking.

**Statement of Objective:** Students will be able to:

**Objectives- Students will be able to:**

- Complete and submit the Create Performance Task.

**Anticipatory Set/Do Now:**

Remarks - There are no new CS concepts covered in this lesson. Students will work individually or with a collaborative partner on the Create Performance Task.

**Learning Activity:**

It is finally time for students to take on the Create Performance Task. For a total of 12 class hours, students should work on their projects with only types of teacher support allowed (essentially: Advise on process, don't influence or evaluate ideas). Students may also work with a collaborative partner in in development of their program - written responses must be done on their own.

The lesson includes reminders about how you can interact with students while they are working on their projects, and suggestions about time line. The Create PT requires a minimum of 12 hours of class time. At the end, students will submit their program code, program video, and written responses through their AP digital portfolio.

- [Activity \(12 hours\)](#)
- [GO! Complete Create Performance Task](#)

**Student Assessment/CFU's:** 2. Hand signals and 9. Observation

**Materials:** Text Book, Handouts, Smart Board and Computers

**21st Century Themes and Skills:** Linked

**Differentiation: Above** - Higher tiered questioning and work sheets, peer teaching Students will score 90% or above

On - On target questioning students will score 80% or above

Below - Basic questioning, teacher assisted practice, misconception checks students will score 75% or above

**Integration of Technology:** Computers used for formatting of documents and production of reports and the Smart TV is used for demonstration of document formation and report production.

CS.9-12.8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.
CS.9-12.8.1.12.CS.2	Model interactions between application software, system software, and hardware.
CS.9-12.8.1.12.CS.3	Compare the functions of application software, system software, and hardware.
CS.9-12.8.1.12.CS.4	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
CS.9-12.CS	Computing Systems
TECH.9.4.12.CI	Creativity and Innovation
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.CT.3	Enlist input from a variety of stakeholders (e.g., community members, experts in the field) to design a service learning activity that addresses a local or global issue (e.g., environmental justice).
TECH.9.4.12.CT.4	Participate in online strategy and planning sessions for course-based, school-based, or other project and determine the strategies that contribute to effective outcomes.  Successful troubleshooting of complex problems involves multiple approaches including research, analysis, reflection, interaction with peers, and drawing on past experiences.

Innovative ideas or innovation can lead to career opportunities.

The usability, dependability, security, and accessibility of devices within integrated systems are important considerations in their design as they evolve.

With a growth mindset, failure is an important part of success.

A computing system involves interaction among the user, hardware, application software, and system software.