BUTLER SCHOOL DISTRICT

Computer Programming with Python I Curriculum

Authored by:
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Adapted from:
NJSLS Computer Science and Design Thinking 2020
CSTA (Computer Science Teachers Association) Standards 2017

Reviewed by:
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Margaret Lynch, Supervisor of STEAM

Adopted:
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VISION

The Butler School District's Technology, Careers and Consumer Service Department's objective is to prepare students to think critically, innovate, communicate, and collaborate in an ever-changing world. The TCC curriculum provides students with quality, rigorous instruction to help them become better **problem solvers, troubleshooters, and analytical thinkers**. The rich, educational experience provided within the Butler School District will produce young adults with the foundation and expertise they need for the future. It is the goal to challenge each student to develop and extend proficiency through highest quality teaching and standard-based assessments that meet the learning needs of each student. Butler TCC students will become individuals who persevere in their pursuit of lifelong learning through a culture that appreciates the beauty and usefulness of 21st century skills.

As a result of a Butler TCC education, students will be able to…

- Synthesize skills across disciplines
- Develop into confident learners.
- Learn at their own pace and advance their understanding in a variety of ways
- Collaborate with others and contribute productively and articulately
- Act responsibly and be accountable for actions, in person and online
- Effectively approach, analyze, plan, and apply appropriate strategies for problem solving in ambitious contexts with accommodations for those who need it.
- Persevere through difficult situations and tasks and maintain a growth mindset despite adversity.
- Draw on knowledge from a wide variety of topics with flexibility to approach the same problem from different perspectives.
- Evaluate situations, draw logical conclusions, and develop, describe and apply solutions.
- Construct and support arguments.
- Evaluate their own reasoning and critique the reasoning of others.
- Assess the reasonableness of a solution with respect to the given construct or problem context.
- Use effective communication to engage in peer collaboration, reflecting on whether or not a solution is viable.
- Use tools to explore and deepen their understanding of concepts.
- Make effective choices regarding the use of any available tools.
- Make appropriate use of technology as a tool that is constantly changing and evolving.
- Attend to precision in their mathematical calculations and in their communication.
- Calculate accurately and efficiently and express numerical answers with a degree of precision that is appropriate to the given context.
- Develop precision in their use of content specific language.
- Look closely to determine patterns and structures.
- Make meaningful connections between their knowledge from previous experiences and the content they are currently exploring.
- Develop deep understandings of concepts such that these understandings become applicable building blocks for future learning.
- Use generalizations to increase the efficiency and manageability of their work.
- Demonstrate growth mindset and grit in effectively approaching ever-rigorous problem solving.
- Apply appropriate strategies with differentiated levels of support.

- Be confident in participating in higher level discussions that will assess and advance the understanding of concepts.
- Learn through exploring and solving contextual problems

COURSE OVERVIEW

Ultimately, the goal of the course is for students to develop fluency in computer language so they can command computers to do a desired task. Students will be given many opportunities throughout the course to apply their knowledge of programming to solve different problems that increase in complexity as their knowledge of computer programming increases.

COMPONENTS OF THE COURSE

GOALS

New Jersey Student Learning Standards - Computer Science and Design Thinking 2020
CSTA (Computer Science Teachers Association) Standards 2017

ASSESSMENT

Student learning will be assessed through a variety of formative, summative, benchmark, and alternative assessments.

SCOPE AND SEQUENCE
(*Pacing Guide*)

Unit of Study	Estimated time
1 Creating Drawings	3 weeks
2 Functions, Mouse Events and Properties	2 weeks
3 Mouse Motion Events, Conditionals and Helper functions	3 weeks
4 More Conditionals, Key Events and Methods	2 weeks

5 Complex conditionals and More Key Events	2 weeks
6 Groups, Step Events and Motions	3 weeks
Projects	2-3 weeks

AFFIRMATIVE ACTION COMPLIANCE STATEMENT

The Butler Public Schools are committed to the achievement of increased cultural awareness, respect, and equity amongst our students, teachers, and community. We are pleased to present all pupils with information pertaining to possible career, professional, or vocational opportunities which in no way restricts or limits options on the basis of race, color, creed, religion, sex, ancestry, national origin, or socioeconomic status.

INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Students with IEPs, 504s, and/or Students at Risk of Failure Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided through conferences and small groups. The teacher utilizes visual and multi-sensory methods of instruction in addition to assistive technology when needed. Students are provided with graphic organizers and other scaffolded material. Modification of content and product may be deemed necessary based on student needs. Students are provided with testing accommodations and authentic assessments.

Gifted & Talented Students Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided to the student through conferences and small groups. Students are engaged through inquiry-based instruction to develop higher-order thinking skills. Activities are developed based on student interests and student goals. Students engage in real-world projects and scenarios.

Multilingual Learners Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided to students through conferences and small groups. Students are pre-taught vocabulary terms and concepts. Teachers engage students through visual learning, including the use of graphic organizers. Teachers use cognates to increase comprehension. The teacher models tasks and concepts, and pairs students learning English with students who have more advanced English language skills. Scaffolding is provided including word walls, sentence frames, think-pair-share, cooperative learning groups, and teacher think-alouds.

21ST CENTURY THEMES & SKILLS

Embedded in many of our units of study and problem based learning projects are the 21st Century Themes as prescribed by the New Jersey Department of Education. These themes are as follows:

- Global Awareness

- Financial, Economic, Business, and Entrepreneurial Literacy
- Civic Literacy
- Health Literacy

CURRICULUM ADDENDA FOR SPECIAL EDUCATION

This curriculum can be both grade and age appropriate for special education students and serves as a guide for the special education teacher in line with the district's written philosophy of special education, as stated within Policy #6700 concerning Programs for Educationally Disabled Students. Based on the Child Study Team evaluation and consultation with the parent and classroom teacher, an individualized education plan may include modifications to content, instructional procedures, student expectations, and targeted achievement outcomes of this curriculum document in accordance with the identified needs of an eligible student. This educational plan will then become a supplement guide that the classroom teacher, parent, and Child Study Team will use to measure the individual student's performance and achievement.

CURRICULUM ADDENDA FOR Multilingual Learners

This curriculum guide is appropriate and is implemented for all students according to age and grade, and is in line with the district's written philosophy of English language acquisition concerning Bilingual Instruction and English as a Second Language Programs. In accordance with the New Jersey Administrative Code 6A:15, the contents herein provide equitable instructional opportunities for Multilingual Learners to meet the New Jersey Student Learning Standards and to participate in all academic and non-academic courses. Students enrolled in a Bilingual and/or an ESL program may, in consultation with the classroom teacher and Bilingual and/or ESL teacher, receive modification to content, instructional procedures, student expectations and targeted achievement outcomes of this curriculum document in accordance with the students developmental and linguistic needs.

DIVERSITY AND INCLUSION

In alignment with the 2020 NJSLS, the TCC Curriculum materials will:

Cultivate respect towards minority groups to foster appreciation of their differences as well as their contributions to the advancement of science

Analyze and appreciate the diverse contributions made in the past (scientifically, economically, politically, and socially) at both the state and federal level as exemplified through science

Examine grade-level texts and resources that simultaneously highlight science as well as the contributions made to it by those of different genders, ethnicities, and abilities.

Employ science as a means of communication — whether in regard to empathy, inclusivity, or advocacy — in an effort to creatively inspire solutions for those with specific needs.

Engage in authentic learning experiences that motivate the acquisition and application of varied perspectives in science

Facilitate the ability to communicate effectively through science while applying content knowledge, interdisciplinary connections, and thinking skills to do so.

Foster active student participation in an inclusive culture that honors scientists of all genders, ethnicities, and abilities.

Analyze and develop an understanding of how scientific, economic, political, social, and cultural aspects of society influence new technological and scientific processes.

Reflect on both personal and non-personal experiences aimed to promote empathy and inclusivity for all regardless of our differences.

UNIT 1: Creating Drawings
3 weeks
UNIT SUMMARY
In this unit, students will… learn to program using Python as the language. In This unit, we will begin by learning to create drawings and shapes using colors and opacity.
NEW JERSEY STUDENT LEARNING STANDARDS
2020 New Jersey Student Learning Standards – Computer Science and Design Thinking **8.1.12.AP.1**: Design algorithms to solve computational problems using a combination of original and existing algorithms. **8.1.12.AP.2**: Create generalized computational solutions using collections instead of repeatedly using simple variables. **8.1.12.AP.3:** Select and combine control structures for a specific application based upon performance and readability, and identify trade-offs to justify the choice. **8.1.12.AP.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue **8.1.12.AP.5**: Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. **8.1.12.AP.6:** Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. **8.1.12.AP.7**: Collaboratively design and develop programs and artifacts for broad audiences by incorporating feedback from users **8.1.12.AP.8:** Evaluate and refine computational artifacts to make them more usable and accessible **8.2.12.ED.1**: Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers. **8.2.12.NT.1**: Explain how different groups can contribute to the overall design of a product. **8.2.12.NT.2**: Redesign an existing product to improve form or function.

8.2.12.EC.1: Analyze controversial technological issues and determine the degree to which individuals, businesses, and governments have an ethical role in decisions that are made.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards-Language Arts (2023)
L.VL.9–10.3. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, including technical meanings, choosing flexibly from a range of strategies.

RI.MF.9–10.6. Analyze, integrate, and evaluate multiple interpretations (e.g., charts, graphs, diagrams, videos) of a single text or text/s presented in different formats (visually, quantitatively) as well as in words in order to address a question or solve a problem.
RI.AA.9–10.7. Describe and evaluate the argument and specific claims in an informational text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.
W.WR.9–10.5. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
SL.PE.9–10.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with peers on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
SL.II.9–10.2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, qualitatively, orally) evaluating the credibility and accuracy of each source.
SL.PI.9–10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.
SL.UM.9–10.5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance findings, reasoning, and evidence and to add interest.

New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills
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.
9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans.
9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas
9.4.12.CI.3: Investigate new challenges and opportunities for personal growth, advancement, and transition
9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving
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.
9.4.12.IML.3: Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions
9.4.12.IML.4: Assess and critique the appropriateness and impact of existing data visualizations for an intended audience
9.4.12.IML.6: Use various types of media to produce and store information on climate change for different purposes and audiences with sensitivity to cultural, gender, and age diversity
9.4.12.IML.8: Evaluate media sources for point of view, bias, and motivations
9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem

CSTA STANDARDS:

3A-AP-139-10 Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
Algorithms & Programming Creating
3A-AP-149-10 Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
Algorithms & Programming Abstraction
3A-AP-169-10 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
Algorithms & Programming Creating
3A-AP-179-10 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
Algorithms & Programming Computational Problems
3A-AP-199-10 Systematically design and develop programs for broad audiences by incorporating feedback from users.
Algorithms & Programming Creating
3A-AP-219-10 Evaluate and refine computational artifacts to make them more usable and accessible.
Algorithms & Programming Testing
3A-AP-229-10 Design and develop computational artifacts working in team roles using collaborative tools.
Algorithms & Programming Collaborating
3A-AP-239-10 Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.
Algorithms & Programming Communicating

ISTE International Society for Technological Education) STANDARDS:
1. Empowered Learner
Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
4. Innovative Designer
Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
5. Computational Thinker
Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
Students:
6. Creative Communicator
Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Programs store data in variables and algorithms are used to manipulate that data.	What is the difference between an iterative and a recursive algorithm and how should each be used?

Using the proper programming style enables others to more easily understand and modify programs. An understanding of data types is essential for accurately tracking the operation of a program.	Why are comments, indentation, and naming conventions important to the readability of a program? Why is it important to know the data type of a variable?

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to:

Download and explore the IDLE IDE.
Utilize the IDE to write simple programs.
Use pseudocode, flowcharts, or words to describe the process for changing a tire or cooking a turkey.
Describe the procedures and subprocedures needed to perform complicated tasks.
Understand the top-down execution of basic Python scripts.
Write simple programs utilizing correct style and naming conventions.
Write programming code declaring and initializing variables and using them to do simple arithmetic.
Write programming code to convert between data types.
Write programming code to verify how much storage space is set aside for each data type.

SUGGESTED ACTIVITIES

Reading materials and Notes: Ready to run a program on the canvas
Videos
Guided practice
Kahoot Unit 1
Review video Unit 1

EVIDENCE OF LEARNING

Formative Assessments: Classroom Discussion Exit Slip Checkpoints Autograder- Immediate feedback on program Exercises Peer Assessment Review Practice Quizzes Unit 1 Rubrics Rubric Participation and teacher observation Think-Pair-Share Concept Map	**Summative Assessment:** Unit Creative Tasks Rubric Unit Quizzes Projects and Exercises Exercise- Lighthouse
Benchmark Assessment: Teacher created Assessments Unit Benchmarks Student Self-Reflection/ Assessment	**Alternative Assessments:** Project Portfolio

INSTRUCTIONAL RESOURCES		
Core Instructional Resource: Carnegie Mellon Course on Programming- Computer Science Academy Computer Science 1 (CS 1)		**Supplemental Resources:** Code.org Khan Academy

INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:
Provide modified notes and access to extra copies online
Provide oral reminders and check student work during independent work time
Model skills/techniques to be mastered
Check and sign assignment planner
Preferential seating
Pair visual prompts with verbal presentations
Modified or scaffolded homework and classwork
Extended time as needed
Provide graphic organizers and study guides

Multilingual Learners:
Provide scaffolded assignments and assessments
Pair visual prompts with visual presentations
Check and sign assignment planner
Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
Extended time for assignment and assessment as needed
Highlight key vocabulary
Use graphic organizers
Provide verbal and written directions
Preferential seating with a English-speaking peer

At Risk of Failure:
Check and sign assignment planner
Encourage class participation and reinforce skills
Model skills and assignments
Extended to time to complete class work
Preferential seating
Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:
Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans
Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers

UNIT 2
2 weeks
UNIT SUMMARY
In this unit, students will… learn to change drawings with functions
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Students:

6. Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Built-in Math module functions exist for more advanced mathematical operations. User-defined functions are used to perform customized tasks within a program.	What is a Function definition ? What is a Function call? What is a Function parameter? What is a Function argument? What is a Function name? What is a Function body?What is Function indenting?

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Run, Test and Autograding Functions

SUGGESTED ACTIVITIES

Reading materials and Notes: Ready to run a program on the canvas
Videos
Guided practice
Kahoot Unit 2
Unit Review video
http://codingbat.com/python

EVIDENCE OF LEARNING

Formative Assessments:	**Summative Assessment:**
Classroom Discussion Exit Slip Checkpoints Autograder- Immediate feedback on program Exercises Peer Assessment Review Practice Quizzes Unit 2 Rubrics Rubric Participation and teacher observation Think-Pair-Share Concept Map	Unit Creative Tasks Rubric Unit Quizzes Projects and Exercises Exercise- Eat the cookie
Benchmark Assessment:	**Alternative Assessments:**

Teacher created Assessments Unit Benchmarks Student Self-Reflection/ Assessment	Project Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource: Carnegie Mellon Course on Programming- Computer Science Academy Computer Science 1 (CS 1)		**Supplemental Resources:** Code.org Khan Academy

INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:
Provide modified notes and access to extra copies online
Provide oral reminders and check student work during independent work time
Model skills/techniques to be mastered
Check and sign assignment planner
Preferential seating
Pair visual prompts with verbal presentations
Modified or scaffolded homework and classwork
Extended time as needed
Provide graphic organizers and study guides

Multilingual Learners:
Provide scaffolded assignments and assessments
Pair visual prompts with visual presentations
Check and sign assignment planner
Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
Extended time for assignment and assessment as needed
Highlight key vocabulary
Use graphic organizers
Provide verbal and written directions
Preferential seating with a English-speaking peer

At Risk of Failure:
Check and sign assignment planner
Encourage class participation and reinforce skills
Model skills and assignments
Extended to time to complete class work
Preferential seating
Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done

Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:
Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans
Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers

UNIT 3 Mouse Motion Events, Conditionals and Helper Functions

3 weeks

UNIT SUMMARY

In this unit, students will… learn to move and drag with a mouse, use if-then statements and helper functions

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SL.UM.9–10.5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance findings, reasoning, and evidence and to add interest.

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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.

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9.4.12.IML.4: Assess and critique the appropriateness and impact of existing data visualizations for an intended audience
9.4.12.IML.6: Use various types of media to produce and store information on climate change for different purposes and audiences with sensitivity to cultural, gender, and age diversity
9.4.12.IML.8: Evaluate media sources for point of view, bias, and motivations
9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem

CSTA STANDARDS:
3A-AP-139-10 Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
Algorithms & Programming Creating
3A-AP-149-10 Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
Algorithms & Programming Abstraction
3A-AP-169-10 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
Algorithms & Programming Creating
3A-AP-179-10 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
Algorithms & Programming Computational Problems
3A-AP-199-10 Systematically design and develop programs for broad audiences by incorporating feedback from users.
Algorithms & Programming Creating
3A-AP-219-10 Evaluate and refine computational artifacts to make them more usable and accessible.
Algorithms & Programming Testing
3A-AP-229-10 Design and develop computational artifacts working in team roles using collaborative tools.
Algorithms & Programming Collaborating
3A-AP-239-10 Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.
Algorithms & Programming Communicating

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1. Empowered Learner
Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
4. Innovative Designer
Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

5. Computational Thinker
Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
Students:

6. Creative Communicator
Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Programs are written to make decisions	What are conditional statements? What is a helper function?

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that… Create and utilize conditional statements

SUGGESTED ACTIVITIES

Reading materials and Notes: Ready to run a program on the canvas
Videos
Guided practice
Kahoot Unit 3
Review video Unit 3

EVIDENCE OF LEARNING

Formative Assessments:	**Summative Assessment:**
Classroom Discussion Exit Slip Checkpoints Autograder- Immediate feedback on program Exercises Peer Assessment Review Practice Quizzes Unit 3 Rubrics Rubric Participation and teacher observation Think-Pair-Share Concept Map	Unit Creative Tasks Rubric Unit Quizzes Projects and Exercises Exercise- Puffy Penguin
Benchmark Assessment: Teacher created Assessments Unit Benchmarks Student Self-Reflection/ Assessment	**Alternative Assessments:** Project Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource: Carnegie Mellon Course on Programming- Computer Science Academy Computer Science 1 (CS 1)		**Supplemental Resources:** Code.org Khan Academy

INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:
Provide modified notes and access to extra copies online
Provide oral reminders and check student work during independent work time
Model skills/techniques to be mastered
Check and sign assignment planner
Preferential seating
Pair visual prompts with verbal presentations
Modified or scaffolded homework and classwork
Extended time as needed
Provide graphic organizers and study guides

Multilingual Learners:
Provide scaffolded assignments and assessments
Pair visual prompts with visual presentations
Check and sign assignment planner
Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
Extended time for assignment and assessment as needed
Highlight key vocabulary
Use graphic organizers
Provide verbal and written directions
Preferential seating with a English-speaking peer

At Risk of Failure:
Check and sign assignment planner
Encourage class participation and reinforce skills
Model skills and assignments
Extended to time to complete class work
Preferential seating
Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:
Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts

Provide alternate or project-based assessments and assignments

Students with 504 Plans
Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers

UNIT 4 More conditionals, Key Events and Methods

2 weeks

UNIT SUMMARY

In this unit, students will… learn to use if-elif-else statements, shape properties that are built in and custom, shape methods

NEW JERSEY STUDENT LEARNING STANDARDS

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8.2.12.NT.2: Redesign an existing product to improve form or function.
8.2.12.EC.1: Analyze controversial technological issues and determine the degree to which individuals, businesses, and governments have an ethical role in decisions that are made.

INTERDISCIPLINARY CONNECTIONS

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3A-AP-219-10 Evaluate and refine computational artifacts to make them more usable and accessible.
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Students:

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ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Conditional Statements in Python perform different computations or actions depending on whether a specific Boolean constraint evaluates to true or false. Conditional statements are handled by IF statements in Python. **Python if Statement** is used for decision-making operations. It contains a body of code which runs only when the condition given in the if statement is true. If the condition is false, then the optional else statement runs which contains some code for the else condition.	What is an 'if' statement? How do you use it? What happens if a conditional statement is not met? How do you use an 'else' condition? How do you use an 'elif' condition?
STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)	
Students are learning to/that… Programs can be written to make decisions	
SUGGESTED ACTIVITIES	
Reading materials and Notes: Ready to run a program on the canvas Videos Guided practice Kahoot Unit 4 Review Video Unit 4	
EVIDENCE OF LEARNING	
Formative Assessments: Classroom Discussion Exit Slip Checkpoints Autograder- Immediate feedback on program Exercises Peer Assessment Review Practice Quizzes Unit 4 Rubrics Rubric Participation and teacher observation Think-Pair-Share Concept Map	**Summative Assessment:** Unit Creative Tasks Rubric Unit Quizzes Projects and Exercises Exercise- Trippy Text

Benchmark Assessment: Teacher created Assessments Unit Benchmarks Student Self-Reflection/ Assessment	**Alternative Assessments:** Project Portfolio

INSTRUCTIONAL RESOURCES

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INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:
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Highlight key vocabulary
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Communicate regularly with students' other teachers

Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:
Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans
Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers

UNIT 5 Complex Conditionals and More Key Events

2 weeks

UNIT SUMMARY

In this unit, students will… learn to use compound conditionals (using ‘and’, ‘or’ or ‘not’, using nested conditionals, onKeyHold and parameters, wraparound

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Students:

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ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Sometimes we need more than a single comparison, so we need a compound conditional We can use the word 'or' inclusively or exclusively	What do the conditions 'and', 'or' or 'not' mean?

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that…
Compound conditionals uses simple tests with special words to create more complex tests
Nested conditionals is another way to test in a compound manner.
Key Events such as 'onkeyhold' can check for multiple keys being held

SUGGESTED ACTIVITIES

Reading materials and Notes: Ready to run a program on the canvas
Videos
Guided practice
Kahoot Unit 5
Review Video Unit 5

EVIDENCE OF LEARNING

Formative Assessments:	**Summative Assessment:**
Classroom Discussion Exit Slip Checkpoints Autograder- Immediate feedback on program Exercises Peer Assessment Review	Unit Creative Tasks Rubric Unit Quizzes Projects and Exercises Exercise- Biking

Practice Quizzes Unit 5 Rubrics Rubric Participation and teacher observation Think-Pair-Share Concept Map	
Benchmark Assessment: Teacher created Assessments Unit Benchmarks Student Self-Reflection/ Assessment	**Alternative Assessments:** Project Portfolio

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Utilize graphic organizers

UNIT 6 Groups, Step Events and Motion

3 weeks

UNIT SUMMARY

In this unit, students will… learn to work with groups and learn about their properties and methods. They will also learn about Step Events which allows you to animate a shape and sometimes animate so that it appears to be moving (motion)

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3A-AP-169-10 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
Algorithms & Programming Creating
3A-AP-179-10 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
Algorithms & Programming Computational Problems
3A-AP-199-10 Systematically design and develop programs for broad audiences by incorporating feedback from users.
Algorithms & Programming Creating
3A-AP-219-10 Evaluate and refine computational artifacts to make them more usable and accessible.
Algorithms & Programming Testing
3A-AP-229-10 Design and develop computational artifacts working in team roles using collaborative tools.
Algorithms & Programming Collaborating
3A-AP-239-10 Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.
Algorithms & Programming Communicating

ISTE International Society for Technological Education) STANDARDS:

1. Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

4. Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

5. Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Students:

6. Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
By placing shapes in a group, we can treat them as a single shape We can utilize step events to have our app change even when the user isn't using the mouse or keyboard We can write code to effect a change in motion	How do you define a group? What properties do groups have?

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that…
Write code that creates motion

SUGGESTED ACTIVITIES

Reading materials and Notes: Ready to run a program on the canvas
Videos
Guided practice
Kahoot Unit 6
Review video Unit 6

EVIDENCE OF LEARNING

Formative Assessments:	**Summative Assessment:**
Classroom Discussion Exit Slip Checkpoints	Unit Creative Tasks Rubric Unit Quizzes Projects and Exercises

Autograder- Immediate feedback on program Exercises Peer Assessment Review Practice Quizzes Unit 6 Rubrics Rubric Participation and teacher observation Think-Pair-Share Concept Map	Exercise- Hungry Giraffe
Benchmark Assessment: Teacher created Assessments Unit Benchmarks Student Self-Reflection/ Assessment	**Alternative Assessments:** Project Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource: Carnegie Mellon Course on Programming- Computer Science Academy Computer Science 1 (CS 1)		**Supplemental Resources:** Code.org Khan Academy

INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:
Provide modified notes and access to extra copies online
Provide oral reminders and check student work during independent work time
Model skills/techniques to be mastered
Check and sign assignment planner
Preferential seating
Pair visual prompts with verbal presentations
Modified or scaffolded homework and classwork
Extended time as needed
Provide graphic organizers and study guides

Multilingual Learners:
Provide scaffolded assignments and assessments
Pair visual prompts with visual presentations
Check and sign assignment planner
Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
Extended time for assignment and assessment as needed
Highlight key vocabulary
Use graphic organizers
Provide verbal and written directions

Preferential seating with an English-speaking peer

At Risk of Failure:
Check and sign assignment planner
Encourage class participation and reinforce skills
Model skills and assignments
Extended to time to complete class work
Preferential seating
Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:
Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans
Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers