BERKELEY HEIGHTS PUBLIC SCHOOLS BERKELEY HEIGHTS, NEW JERSEY

ELEMENTARY SCHOOLS COMPUTER DEPARTMENT

COMPUTERS K-5

Curriculum Guide

Date: September 2017 Updated: December 2019

Dr. Melissa Varley, Superintendent Mr. Scott McKinney, Assistant Superintendent Mr. James Finley, District Supervisor

> Developed by: Mike Riley Patti Schiffl

This curriculum may be modified through varying techniques, strategies, and materials, as per an individual student's Individualized Education Plan (IEP).

Approved by the Berkeley Heights Board of Education at the regular meeting held on <u>12/5/19</u>.

VISION STATEMENT

In today's complex society, we must create opportunities for students to build knowledge and develop skills, to function as productive adults in the world of tomorrow. As young people prepare to enter and compete in the 21st Century, they must demonstrate computer and technological literacy. Educational systems need to prepare students to access and discern the validity of available information.

It is our vision that Computer Education will produce individuals who can participate in, interact with, and adapt to a dynamic technological society. Internet ethics and safety will be key aspects of the curriculum as students learn to utilize web resources, evaluate websites, and differentiate appropriate sources and information.

Students will be prepared to meet state expectations for computer-based standardized testing. Additionally, they will be introduced to and made aware of newly emerging technologies, including those available through mobile devices.

In our ever-evolving world, it is necessary to teach computer skills while acknowledging that students arrive in school with varying degrees of computer awareness. Our challenge is to address all the various levels of computer awareness while providing all students with current technology information and skills that apply to their academic and personal life. This preparation will enable our students to achieve lifelong success in our society and the workplace.

MISSION STATEMENT

The mission of the Computer Education program (K-8) is to insure that students will continue to become technology literate and be successful in a technological world. The students will become interactive learners while exercising higher-level thinking skills. Technology shall be used by the teacher to create learning environments that link to other disciplines and enhance and challenge each student's approach to learning.

The following mission objectives are accomplished through a progression of activities developed by the teacher:

- To provide student learning using technology equipment, activities, and peer instruction to challenge the student to perform at high levels of proficiency
- To integrate technology into all content areas, thereby exposing the student to diverse, unique, "real-life" experiences
- To foster student skills in order to become seekers, navigators, and evaluators of information while keeping in mind the need for Internet safety and ethics
- To develop responsible citizens who utilize current services to gather information so that thoughts can be organized and communicated effectively
- To foster student growth as responsible Internet users while they utilize and evaluate Web resources for authority and differentiate appropriate sites for accurate information
- To provide students with the necessary skills to achieve success in a computer-based standardized testing format
- To introduce students to newly emerging technologies, including those on mobile devices
- To participate responsibly and communicate appropriately when utilizing social media
- To develop problem solving, critical thinking, and logical reasoning by engaging in computer programming experiences and tasks.

The foundation of technology instruction begins in elementary schools. Kindergarten and 1st grade students have tech integrated into classroom activities. The students in grades 2-8 receive formal instruction with a technology specialist in the computer lab. In addition, those students receive technology instruction from the media specialist, the classroom teacher, and/or special subject teachers to supplement the curriculum and to enrich learning.

This program addresses the New Jersey Standards for Educational Technology and 21st Century Life Skills. The district's goal is to update and modify this curriculum whenever necessary to ensure that we keep up with changing technologies.

COURSE PROFICIENCIES COURSE OBJECTIVES

The K-8 computer education curriculum guide aims to expose and teach a broad selection of topics. In general, the students will be proficient in the following components appropriate to their grade level:

- 1. Understand and use technology systems.
- 2. Select and use applications effectively and productively
- 3. Utilize a variety of word processing and spreadsheet programs.
- 4. Apply existing knowledge to generate new ideas, products, or processes.
- 5. Create original works as a means of personal or group expression.
- 6. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
- 7. Evaluate and select information sources and digital tools based on the appropriateness for specific tasks
- 8. Identify and define authentic problems and significant questions for investigation
- 9. Plan and manage activities to develop solutions
- 10. Collect and Analyze data to identify solutions and/or make informed decisions
- 11. Use multiple processes and diverse perspectives to explore alternative solutions
- 12. Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media
- 13. Contribute to project teams to produce original works or solve problems
- 14. Utilize computational thinking and computer programming as tools used in design and engineering.
- 15. Advocate and practice safe, legal, and responsible use of information and technology.

STUDENT PROFICIENCIES

Knowledge and skill proficiencies are indicated on the scope and sequence chart for specific topics and grade levels.

In general, the students will be able to:

- 1. Recognize and identify the various components of the computer using proper terminology.
- 2. Properly utilize of hardware and software.
- 3. Apply technology tools and skills to specific curriculum assignments, e.g., research, problem-solving, and presentations.
- 4. Appropriately use the Internet.
- 5. Access and evaluate information from the Internet and other resources.
- 6. Develop an appreciation for the rapid, continuous advancement of technology and its impact on society.
- 7. Develop an awareness of the impact of technology on privacy, individual rights, and their role in respecting those rights.
- 8. Teach students to abide by, and be aware of, copyright laws.
- 9. Discuss safe and appropriate use of electronic equipment.
- 10. Utilize newly emerging technologies, including control systems, mobile devices and microprocessors.
- 11. Engage in a variety of developmentally appropriate learning activities for the purpose of online collaboration.

METHODS OF EVALUATION

In the Berkeley Heights Public Schools, computer skills are taught to students at all grade levels K-8. The students will become technologically literate and will utilize computers, with proficiency, in their daily lives.

Students will be assessed using one or all of the following:

- Informal and anecdotal teacher observations, e.g., student verbal identification of computer hardware, notations regarding individual needs, or individual progress status K-8
- Checklists and rubrics, e.g., teacher grade books 2-8, grade level collaborative projects, and individual final projects grades 2-8
- Online Assessment Instruments, e.g., Progress on keyboarding websites and software grades 2-8, 6-8th proficiency on coding, 4th/8th grade computing assessment.
- Project Work and presentations; e.g., applications assessed based on content, technology, and design grades 2-8
- Other Test/Quizzes

The teachers will use the results of these assessments to develop resources and services to support students, as well as to drive the curriculum.

MODIFICATIONS & ACCOMMODATIONS

Modifications and Accommodations for Special Education students, students with 504s, English Language Learners and Gifted and Talented students may include but are not limited to the following:

Special Education

- Individualized Education Plans (IEPs)
- Exemplars of varied performance levels
- Multimedia presentations
- Sheltered instruction
- Consultation with ESL teachers
- Manipulatives
- Tiered/Scaffolded Lessons
- Mnemonic devices
- Visual aids
- Modeling
- Guided note-taking
- Study Guides
- Modified homework
- Differentiated pre-typed class notes and example problems
- Use of the special education teacher to re-instruct in flexible small groups for the struggling learner
- Manipulatives
- Flipped Instruction
- Word banks
- Reduced choice on assessments
- Preferential seating
- Choice activities
- Modified time requirements
- Modified notes
- Modified lesson, assessment and study guide format
- Provide an enriched curriculum and activities
- Independent projects
- Contracts/behavior support plans
- Open-ended responses
- Project-based learning
- Group activities
- Guided Notes
- Functional learning incorporated into each lesson
- Exploration Activities
- Assessment read aloud
- Small group assessments
- Organizational Support

- Oral questioning assessments to supplement written response
- Pre-writing Structural Supports for extended writing tasks
- Ongoing teacher feedback as part of the writing process
- Interactive Study Guides
- Multi-sensory approach to instruction
- Written and spoken step-by-step directions
- Content-focused assessment (not grading for spelling/grammar)
- Graphic organizers
- Non-verbal cues to begin task/remain on task/refocus
- Individual monitoring for understanding/reinforced instruction
- Printed copies of class readings for application of Active Reading Strategies

Gifted & Talented

- Provide one-to-one teacher support
- Curriculum Compacting
- Advanced problems to extend the critical thinking skills of the advanced learner
- Supplemental reading material for independent study
- Elevated questioning techniques using Webb's Depth of Knowledge matrix
- Curriculum Compacting
- Flexible grouping
- Tiered assignments
- Topic selection by interest
- Manipulatives
- Tiered Lessons
- Flipped Instruction
- Multimedia Presentations
- Open-ended responses
- Project-based learning
- Group activities
- Guided Notes
- Conclusions and analysis of exploratory activities
- Career based learning incorporated into each lesson
- Exploration Activities
- Student choice

ELLs

- Exemplars of varied performance levels
- Multimedia presentations
- Sheltered instruction
- Consultation with ESL teachers
- Manipulatives
- Tiered/Scaffolded Lessons
- Mnemonic devices
- Visual aids
- Modeling

- Guided note-taking
- Study Guides
- Modified homework
- Differentiated pre-typed class notes and example problems
- Individualized instruction plans
- Manipulatives
- Flipped Instruction
- Words banks
- Reduced choice on assessments
- Preferential seating
- Choice activities
- Modified time requirements
- Modified notes
- Modify lesson, assessment and study guide format
- Provide an enriched curriculum and activities
- Contracts/management plans
- Open-ended responses
- Project-based learning
- Group activities
- Guided Notes
- Exploration Activities
- Assessment read aloud
- Small group assessments
- Oral questioning assessments to supplement written response
- Pre-writing Structural Supports for extended writing tasks
- Ongoing teacher feedback as part of the writing process
- Interactive Study Guides
- Multi-sensory approach to instruction
- Written and spoken step-by-step directions
- Graphic organizers
- Non-verbal cues to begin task/remain on task/refocus
- Individual monitoring for understanding/reinforced instruction
- Printed copies of class readings for application of Active Reading Strategies

50<u>4s</u>

- Exemplars of varied performance levels
- Multimedia presentations
- Sheltered instruction
- Tiered/Scaffolded Lessons
- Mnemonic devices
- Visual aids
- Modeling
- Guided note-taking
- Study Guides
- Differentiated pre-typed class notes and example problems

- Manipulatives
- Words banks
- Reduced choice on assessments
- Preferential seating
- Modified time requirements
- Modified notes
- Modify lesson, assessment and study guide format
- Modified homework
- Independent projects
- Contracts/management plans
- Open-ended responses
- Project-based learning
- Group activities
- Guided Notes
- Exploration Activities
- Assessment read aloud
- Small group assessments
- Organizational Support
- Oral questioning assessments to supplement written response
- Pre-writing Structural Supports for extended writing tasks
- Ongoing teacher feedback as part of the writing process
- Interactive Study Guides
- Multi-sensory approach to instruction
- Written and spoken step-by-step directions
- Content-focused assessment (not grading for spelling/grammar)
- Graphic organizers
- Non-verbal cues to begin task/remain on task/refocus
- Individual monitoring for understanding/reinforced instruction
- Printed copies of class readings for application of Active Reading Strategies

Students at Risk of Failure

- Exemplars of varied performance levels
- Multimedia presentations
- Tiered/Scaffolded Lessons
- Modeling
- Guided note-taking
- Study Guides
- Differentiated pre-typed class notes and example problems
- Individualized instruction plans
- Words banks
- Reduced choice on assessments
- Preferential seating
- Choice activities
- Modified time requirements
- Modified notes

- Modified lesson, assessment and study guide format
- Modified homework
- Provide an enriched curriculum and activities
- Contracts/management plans
- Open-ended responses
- Project-based learning
- Group activities
- Guided Notes
- Exploration Activities
- Assessment read aloud
- Small group assessments
- Oral questioning assessments to supplement written response
- Pre-writing Structural Supports for extended writing tasks
- Ongoing teacher feedback as part of the writing process
- Interactive Study Guides
- Multi-sensory approach to instruction
- Written and spoken step-by-step directions
- Graphic organizers
- Non-verbal cues to begin task/remain on task/refocus
- Individual monitoring for understanding/reinforced instruction
- Printed copies of class readings for application of Active Reading Strategies

SCOPE AND SEQUENCE COURSE OUTLINE/STUDENT OBJECTIVES

Unit 1: Hardware and Computer Function Duration: Ongoing			
	Grade: K-3	Grade: 4-5	
Students Objectives	Standard: 8.1.2.A.1	Standard: 8.1.5.A.1	
·	21st Century: CRP2; CRP4; CRP6; CRP8; 9.3.ST-ET.3; 9.3.ST-SM.2; Cross-Curricular: NJSLSA.W6; NJSLSA.W8; NJSLSA.L6; MP.1		
Understand and use technology systems.	Identify the basic features of a digital device and explain its purpose. - Specifically discuss monitor, hard disk drives, server, cloud, mouse, printer, keyboard - Power on/power off the computer - Recognize icons and their functions - Open, close, and restore windows - Open and exit a software program or file - Use the mouse/ touchpad and touchscreen to perform the following tasks - Manipulate objects on screen - Selecting/deselecting responses (check marks/drop-down menus) - Clicking and dragging (drag / drop). - Using scrollbars	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. - Login/logout of computer/network - Print independently – selecting correct printer - Use pull-down menus and commands - Use "Save As" appropriately - Use keyboard shortcuts - Access and save to a network folder or other storage device - Use split screen to multitask - Using help program options, online video, or tutorials	

	Grade: K-3	Grade: 4-5	
Students Objectives	Standard: 8.1.2.A.2	Standard: 8.1.5.A.2	
	21st Century: CRP2; CRP4; CRP6; CRP8; 9.3.ST-ET.3; 9.3.ST-SM.2; Cross-Curricular: NJSLSA.W6; NJSLSA.W8; NJSLSA.L6; MP.1		
Select and use applications effectively and productively	Create a document using a word processing application Enter and delete text - Recognize, manipulate, and use toolbars - Use basic tools like copy/cut/paste	Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures Recognize, manipulate, and use toolbars - Use the clipboard	
Students should be exposed to a variety of word processing programs. This	- Use basic formatting like italics, bold, and underline - Indent paragraphs	 - Use the chipboard - Import drawings into the word processor - Format a picture - Insert a page break - Change the margins and line spacing 	
should include but is not limited to Docs, Pages, and Word	Compare the common uses of at least two different applications (i.e. Word vs. Docs) - Identify the advantages and disadvantages	 Import and text wrap an object (clip art, word art, shapes) Change the paper orientation Insert a drop cap Change line spacing Insert a paragraph border 	

	Grade: K-3	Grade: 4-5	
Students Objectives	Standard: 8.1.2.A.5-7	Standard: 8.1.2.A.4-6	
ŕ	21st Century: CRP2; CRP4; CRP6; CRP8; 9.3.ST-ET.3; 9.3.ST-SM.2; Cross-Curricular: NJSLSA.W6; NJSLSA.W8; NJSLSA.L6; MP.1		
Select and use applications effectively and productively:	- specifically including form, table, cells,	Create and use a database to answer basic questions - Use a program like Google Forms to collect	
Spreadsheets	columns, rows, sorting, and filtering Enter information into a spreadsheet and	data - Export data from a database into a spreadsheet	
Students should be	process the information.	spreausileet	
exposed to a variety of spreadsheet programs.	- Create a Spreadsheet / Database - Navigate in a spreadsheet	Analyze and produce a report that explains the analysis of the	
This should include	- Add and edit data	- Graph data using a spreadsheet	
but is not limited to	- Use fill down/across	- Format and merge cells	
Sheets, Numbers, and	- Filter the data based on criteria	- Format/edit graphs and charts	
Excel	- Sort the data based on criteria	- Analyze and produce a report that explains the analysis of the data	

Unit 4: Creativity and Innovation Duration: 10 days			
	Grade: K-3	Grade: 4-5	
Students Objectives	Standard: 8.1.2.B.1	Standard: 8.1.2.B.1	
,	21st Century: CRP2; CRP4; CRP6; CRP8; 9.3.ST-ET.3; 9.3.ST-SM.2; Cross-Curricular: NJSLSA.W6; NJSLSA.W8; NJSLSA.L6; MP.1		
Apply existing knowledge to generate new ideas, products, or processes.	Create a story about a picture taken by the student on a digital camera, ipad, or mobile device - Import media resources from a peripheral device Illustrate and communicate original ideas and	Collaborate to produce a digital story or presentation about a significant local event or issue based on first-person interviews. - Apply a slide design and layout - Insert slides - Copy/paste a graphic from the Internet - Insert media from file	
Create original works as a means of personal or group expression.	stories using multiple digital tools and resources - Create a picture/design using graphic software (i.e. MS paint) - Create a new presentation (using slides / Powerpoint / keynote) - Use the menus and toolbars - Add student created graphic to a slide - Include additional objects including word art, text, and graphics - Apply a slide background	- Create an action button - Edit a button	

Unit 5: Internet, Research, and Social Media Duration: 20 days			
· · · · · · · · · · · · · · · · · · ·	Grade: K-3	Grade: 4-5	
Students Objectives	Standard: 8.1.2.E.1	Standard: 8.1.5.E.1	
,	21st Century: CRP2; CRP4; CRP6; CRP8; 9.3.ST-ET.3; 9.3.ST-SM.2; Cross-Curricular: NJSLSA.W6; NJSLSA.W8; NJSLSA.L6; MP.1		
Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media Evaluate and select information sources and digital tools based on the appropriateness for specific tasks	Use digital tools and online resources to explore a problem or issue. - Use an Internet toolbar to navigate - Navigate teacher chosen Websites	Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. - Perform searches - Use electronic reference tools - Acquire information such as text, audio, and graphics	
Students Objectives	Standard: 8.1.2.F.1	Standard: 8.1.5.F.1; 8.1.5.A.4	
Identify and define authentic problems and significant questions for investigation Plan and manage activities to develop solutions Collect and Analyze data to identify solutions and/or make informed decisions Use multiple processes and diverse perspectives to explore alternative solutions	Use geographic mapping tools to plan and solve problems or answer questions (i.e.Google Maps)	Apply digital tools to collect, organize, and analyze data that supports a scientific finding (i.e. Google Earth) Use a graphic organizer to organize information about a problem or issue - Utilize tools such as Google Draw, lucid charts, or Inspiration	
Students Objectives	Standard: 8.1.2.C.1	Standard: 8.1.5.C.1	
Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media	Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media. - Use collaborative tools like Google Classroom to share ideas or solutions to problems between classes	Engage in online discussions to investigate a worldwide issue from multiple perspectives and sources - Utilize tools like Google Classroom, Wikispaces, or blogs like Scholastic.org - Demonstrate safe and appropriate Internet use	

Contribute to project teams to produce	Evaluate findings and present possible solutions, using digital tools and online	
original works or solve problems	resources for all steps Perform searches	
F	- Acquire information such as text, audio, and graphics	

Unit 6: Programming Duration: 10 days			
	Grade: K-3	Grade: 4-5	
Students Objectives	Standard: 8.2.2.E.1; 8.2.2.E.2; 8.2.2.E.3; 8.2.2.E.4; 8.2.2.E.5; 8.2.2.A.4	Standard: 8.2.5.E.1; 8.2.5.E.2; 8.2.5.E.3; 8.2.5.E.4	
	21st Century: CRP2; CRP4; CRP6; CRP8; 9.3.ST-ET.3; 9.3.ST-SM.2; Cross-Curricular: NJSLSA.W6; NJSLSA.W8; NJSLSA.L6; MP.1		
Utilize computational thinking and computer programming as tools	List and demonstrate the steps to an everyday task.	Identify how computer programming impacts our everyday lives.	
used in design and engineering.	Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.	Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.	
	Create algorithms (a sets of instructions) using a predefined set of commands (e.g., to move a student or a character through a maze).	Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output.	
	Debug an algorithm (i.e., correct an error).	Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing,	
	Use appropriate terms in conversation (e.g. input, output, operating system, debug, and algorithm).	software, coding, procedure, and data).	
	Demonstrate developmentally appropriate navigation skills in the virtual environment		

Unit 7: Digital Citizenship Duration: Ongoing*			
	Grade: K-3 Standard: 8.1.2.D.1	Grade: 4-5 Standard: 8.1.5.D.1-4	
Students Objectives	21st Century: CRP2; CRP4; CRP6; CRP8; 9.3.ST-ET.3; 9.3.ST-SM.2; Cross-Curricular: NJSLSA.W6; NJSLSA.W8; NJSLSA.L6; MP.1		
Advocate and practice safe, legal, and responsible use of information and technology.	Develop an understanding of ownership of print and non-print information Understand the need for and use of copyrigh Analyze the resource citations in online materials for proper use.		

Demonstrate personal responsibility for	Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.
lifelong learning.	Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of
Exhibit leadership for digital citizenship.	technology and social media.

^{*}Especially emphasized in "Internet and Social Media" and "Internet and Research"

SUGGESTED MATERIALS

Resources for Students

	Computer Based	Cloud/Internet Based	Tablet
Word Processing	Microsoft Word	Google Docs	Pages iOS
Spreadsheets	Microsoft Excel	Google Sheets	Numbers iOS
Presentation	Microsoft	Google Slides	Keynote iOS
	PowerPoint		
Desktop	Microsoft Publisher		
Publishing			
Database		Google Forms	
		codecademy.com	
Computer		code.org	Tynker
Programing /		scratch.com	Hopscotch
Coding		Tynker.com	Swift
		khanacademy.org	
Keyboarding		Typing.com	
	Stickybear	Dance Mat Typing	
Graphic Organizing	Inspiration		
Content Creation	KidPix		iMovie
Content Creation			IMOVIE
Research	Photoshop	agarbib gam	
kesearcn		easybib.com	
		citationmachine.net	
, , , , , , , , , , , , , , , , , , ,			

^{*}teacher websites contain additional resources

Resources for Teachers:

New Jersey Student Learning Standards http://www.state.nj.us/education/cccs/2014/tech/ International Society for Technology and Education www.iste.org Technology and Learning Journal www.techlearning.com United Streaming www.streaming.discoveryeducation.com

District Online Subscriptions

- BrainPop Username: *bhpsnj* Password: *bhpsnj*
- Enchanted Learning: Contact school librarian for access information