Clinton-Glen Gardner School District

Curriculum Management System

Computer Technology

Grade 7

August 2015

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CLINTON-GLEN GARDNER SCHOOL DISTRICT

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Clinton-Glen Gardner School District

Mission

The mission of the Clinton-Glen Gardner School District is to inspire our students to become contributing members of society who are independent, innovative, life-time learners equipped with the necessary skills to meet the demands of our ever-changing world.

Philosophy

New technologies are evolving at a rapid rate with both frequent advancements of existing technologies and the creation of new ones. It is important that all students understand and develop familiarity with these ever-emerging technologies and have the ability to execute basic computer skills to choose, operate, and troubleshoot applications in school, at home, and later in the workplace. Technology is uniquely positioned to transform learning, to foster critical thinking, creativity, and innovation, and to prepare students to thrive in a global society. As digital learners, students are able to acquire and apply content knowledge and skills through active exploration, interaction, and collaboration with others. Doing so will enable students to function in our evolving society as informed, productive members of while broadening their understanding, use and application of state of the art technology. Technology enables students to solve real world problems, enhance life, and extend human capability as they meet the challenges of a dynamic global society. The curriculum assists students in accomplishing the following goals:

- Applying information-literacy skills to access, manage, and communicate information using a range of technological tools
- Integrating technology with content area learning
- Obtaining, comprehending, and manipulating information to attain goals
- Exploring and experiencing existing technology
- Demonstrating competency in using technology as a tool for learning

New Jersey State Department of Education
Core Curriculum Content Standards

A note about Technology Standards and Cumulative Progress Indicators:

In October of 2014, the NJDOE adopted the following technology standards:

8.1 Educational Technology ([Word](#) | [PDF](#)):
All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate, and to create and communicate knowledge.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming ([Word](#) | [PDF](#)):
All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

According to the International Society for Technology Education, "advances in technology have drastically changed the way we interact with the world and each other. The digital age requires that we understand and are able to harness the power of technology to live and learn". To this end, our current curriculum is undergoing a year long process of reflection and revision to ensure that the design process builds in our students the recognition that success is not merely identifying a problem but working through a process--- and that failure is not an end but rather a point for reevaluation. Computational thinking provides an organizational means of approaching life and its tasks. It develops an understanding of technologies and their operations and provides students with the abilities to build and create knowledge and new technologies. Not all students will be programmers, but they should have an understanding of how computational thinking can build knowledge and control technology. For example, in grade 8, we are supplementing our current curriculum with Lego EV3 Design Engineering Projects that let students work with open-ended problem solving activities, in a context which makes it fun and engaging to learn using Science, Technology, Engineering and Mathematics.

The projects combine science and mathematics concepts with soft skills, such as creative thinking, problem solving, teamwork and communication skills, boosting 21st century learning skills. All projects follow a design engineering process as used by engineers in various industries. The design engineering process provides a structured flow through the activities. Students are guided through the process starting with a design brief which explains the challenge, using videos of robots in action to make real life connections, and includes a final project which can be shared and presented. It is our goal to adapt these learning activities for grades K-7 after our initial implementation in grade 8.

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Grade 7
Computer Technology
Scope and Sequence

Quarter I

Topic: Word Processing
I. Numerations
   a. Bullets, numbering, symbols
II. Alignments
   a. Left, right, center
	Topic: Advanced Word Processing- Drawing
	III. Text boxes
	IV. Lines
	V. Autoshapes
	VI. Word Art

Topic: Digital Images VII. Collect still images VIII. Import music file IX. Edit images and/or music	Topic: Database X. Function and uses XI. Navigating XII. Development of personal database

21st Century Skills (The ones that apply for this unit are in bold)

· **Creativity & Innovation**
· Critical Thinking & Problem Solving
· Communication & Collaboration
· **Media Literacy**
· Information Literacy
· **Information, Communication & Technology**

21st Century Themes (The ones that apply for this unit are in bold)

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

Assessment
District Benchmark

Differentiation

The technology classroom offers a one-to-one environment in which each student has access to a computer; therefore, students have their own "differentiation in a box." While each student has the same tools, those tools can be manipulated in ways that serve individual needs. Also, a one-to-one environment simplifies other aspects of differentiation, because students have ready access to differentiated content, tools for differentiated learning processes, and resources for creating differentiated products. The instructor will also use the following guidelines to inform the nature of differentiation:

● Choosing learning goals
● Making practical pedagogical decisions about the nature of the learning experience
● Selecting and sequencing activity types to combine to form the learning experience
● Selecting formative and summative assessment strategies that will reveal what and how well students are learning
● Selecting tools and resources that will best help students to benefit from the learning experience being planned.

This framework emphasizes that the selection of tools and resources should follow naturally from the specific needs of the student. This model increases the likelihood of seamless, successful technology instruction that meets the needs of all learners. For specific examples, http://www.learnnc.org/lp/editions/every-learner/67

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: Grade 7 Computer Technology	Topic: Digital Images	
		Goal 1: The student will be able to combine various digital files to create a multimedia presentation.	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions, Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
12	1.1. Create a multimedia presentation including sound and images. (8.1.8.A.3) 1.2. Insert music into a video editing software. 1.3. Create a list and find appropriate images for their video. 1.4. Edit images if needed. 1.5. Import images into video editing software. 1.6. Adjust length of image. 1.7. Add video effects. 1.8. Convert image to DVD protocol. 1.9. Design and implement a project management plan using one or more problem-solving strategies. (9.1.8.A.4)	**Essential Questions:** What types of media can be used to present information to the public? **Conceptual Understandings:** The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.	**Learning Activities:** **Assessment Models:** Product that contains still images, photos, sounds and music that are synchronized. **Additional Resources:** iPod cable Audacity or similar software program Photo editing software Video editing software

	1.10. Explain technology has strengthened the role of digital media in the global society. (9.1.8.E.1) 1.11. Demonstrate how productivity and accountability contribute to realizing individual or group work goals within or outside the classroom. (9.1.8.F.1)		

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: Grade 7 Computer Technology	Topic: Database	
		Goal 2: To create a collaborative database with classmates who each enter their data for a survey completed on a relevant classroom topic to increase community awareness. Analyze the data by querying sorting and developing a graphical display. Use the analysis to validate any conclusions or hypothesis. Write an explanatory text to support the development of a public service document conveying ideas and concepts.
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions, Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
12	2.1. Plan and create a simple database, define fields, input data, and produce a report using sort and query. (8.1.8.A.2) 2.2. Add, edit and delete information in a database.	**Essential Questions:** How is data used to inform the public? How do we gather and present information? **Conceptual Understandings** The use of technology and	**Learning Activities:** Adding and deleting information from a database Adding and changing fields within a database Sorting and finding information within a database **Assessment Models:** Creation of own

Note: The table header row spans: "Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)" column and others.

	2.3. Navigate within a predesigned database. 2.4. Generate reports from various databases. 2.5. Create a new database. 2.6. Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills. (9.1.8.A.1) 2.7. Determine an individual's responsibility for personal actions and contributions to group activities. (9.1.8.C.1) 2.8. Model leadership skills during classroom and extra-curricular activities. (9.1.8.C.3) 2.9. Demonstrate how productivity and accountability contribute to realizing individual or group work goals within or outside the classroom. (9.1.8.F.1) 2.10. Explain how rules, laws, and safety practices protect individual rights in the global workplace. (9.1.8.F.2) 2.11. Relate the use	digital tools requires knowledge and appropriate use of operations and related applications.	database that contains 5 fields and at least 15 records, sorted by a field. **Additional Resources:** Database software Predesigned databases Audacity Google Forms CutePDF

	of new technologies at home, in the workplace, and in other settings to incidences of ethical and/or unethical behavior. (9.1.8.F.3)		

	Curriculum Management System Subject/Grade Level: Grade 8 Computer Technology	Topic: Robotics
Suggested days of Instruction 20		Goal 3: The students will use the Lego Mindstorms EV3 kits and programming guides to build and program working models of robots. The students will learn to code using a block based programming method to instruct the robot to solve authentic real world tasks such as locating and removing objects from a defined space. Lego robotics provides a practical way to give students a good understanding of programming and how it directly influences our physical environment.
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions, Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	3.1 Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system. **8.2.8.A.2** 3.2 Investigate a malfunction in any part of a system and identify its impacts. **8.2.8.A.3** 3.3 Explain how different teams/groups can contribute to the overall design of a product	**Essential Questions:** ● What are robots and how are they used in society? ● How is the field of robotics changing modern life? ● How important is the Design Process when creating a robot to perform a specific tasks ● What does it mean to code? ● What is an algorithm? ● How can I solve a larger problem by breaking it down into smaller steps? ● Why is the robot not	**Learning Activities:** Lego® Education EV3 Intro to Programming Units: Moving Straight Turning Move Until Touch Move Until Near Turn for Angle Move Until Color Loops Switches Switch Loops Line Follower **Assessment Models:** Completion of Lego® Education EV3 Intro to Programming Units.

	8.2.8.C.1 3.4 Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution. **8.2.8.C.6** 3.5 Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution. **8.2.8.D.3** 3.6 Demonstrate an understanding of the relationship between hardware and software. **8.2.8.E.2** 3.7 Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution. **8.2.8.E.3** 3.8 Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms). **8.2.8.E.4**	doing what I want it to do? ● How does one troubleshoot and maintain a robotic system? **Conceptual Understandings:** ● Engineering design is an interactive process with a defined cycle of steps ● Robots can be controlled via coding ● Sensors allow robots to interact with the world ● Engineers work cooperatively in teams to accomplish a task ● Programming is based on a series of steps (algorithms) that define goals and rules ● Difficult problems can be solved by breaking them down into smaller components, building up toward the solution ● Computational thinking applies to the real world	Daily Activity analysis **Additional Resources:** Lego® Education EV3 Base Kit http://www.education.rec.ri.cmu.edu/roboticscurriculum/index.html http://www.legoeducationcom/global.aspx http://www.usfirst.org http://www.odysseyofthemind.com Carnegie Mellon Robotics Academy Lego Education US First - inspiration & Recognition of Science & Technology Odyssey of the Mind – International education program