Westampton Township School District

Computer Science and Design Thinking
Curriculum Guide

Kindergarten – Eighth Grade

Approved by Westampton Township Board of Education: February 13, 2023

Westampton Township School District

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Curriculum Guide

Kindergarten – Eighth Grade

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Introduction

District Mission Statement

The Westampton School District, in partnership with its Community, shall do whatever it takes to ensure that every child achieves or exceeds proficiency in the current New Jersey Student Learning Standards.

Be open! Be creative! Be accountable!

Vision Statement

To create a climate where the Community and District support the instructional process by incorporating an effective, comprehensive communication system that incorporates the whole child as its driving force involving parents, staff, and the Community by utilizing appropriate data to challenge the students and teachers to maximize each student's level of achievement.

Curriculum and Instruction Vision Statement

Westampton Township School District's Office of Curriculum and Instruction is committed to supporting, implementing, and supervising K – 8 curricula that is rigorous, meaningful, differentiated, culturally responsive, and academically challenging to ensure that students receive high-quality instruction that promotes excellence and high expectations, prepares all students for the rigors of high school and postsecondary education and produces dynamic student achievement and lifelong learners.

Computer Science and Design Thinking Education Philosophy

Computer science and design thinking encompasses the collection, organization and presentation of information. Students are empowered by the use of computers, software, digital media and related technologies. It is expected that students will utilize these powerful tools for learning, productivity, communication, creativity, entertainment and research. Due to the rapid, ongoing advances in technology, students will be required to hone previously mastered as well as acquire new skills to continue to take full advantage of technology.

The computer science and design thinking program of the Westampton School District acknowledges these rapid changes by providing a flexible framework to incorporate technological advancements. To accomplish this, the program focuses on generic proficiency, not attached to technology. Instruction of these skills will be integrated into daily educational methods and used to support and enhance other curricula.

It is the goal of the Westampton School District to offer a comprehensive educational computer science and design thinking program. Our intent is to provide all students with the necessary skills as well as an understanding of the role of computer science and design thinking in our lives.

Curriculum Guide

The Computer Science and Design Thinking Curriculum is developed to reflect the mission and vision of the Westampton Township School District and is guided by the 2020 New Jersey Student Learning Standards. Its content, which includes instructional objectives, teaching strategies, learning activities, assessment, and resources, are tools that should be utilized throughout the school year by teachers to ensure that all students receive a rigorous, standards-based instruction.

In the elementary computer science and design thinking curriculum, the curriculum is organized in units, designed to introduce students to the basic skills and knowledge that is necessary to build a strong foundation in all areas of technology and digital media. In Grades K – 2, the curriculum is designed to expose students to basic types of technology, their functions and uses. Grades 3- 5 units are designed similarly to Grades K – 2. However, students are introduced to a wider variety of technology tools and resources.

The units of the middle school computer science and design thinking curriculum extends the skills and knowledge taught at the elementary level by scaffolding the students' knowledge, and challenging them to begin to use the learned technology resources available to aid, guide and expand upon student knowledge and ideas.

This guide is ongoing and will continue to evolve as research changes and classroom practice determines new ways to teach students and increase student achievement. This document allows for ongoing dialogue and contributions by teachers and administrators to ensure that this guide provides the best education possible for all students.

Computer Science and Design

Theme/Unit: **Computing Systems, Networks and the Internet, Impacts of Computing, Data & Analysis, Algorithms & Programing**	**Suggested Sequence:** **Ongoing**

New Jersey Student Learning Performance Expectations:

8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
8.1.2.CS.2: Explain the functions of common software and hardware components of computing systems.
8.1.2.CS.3: Describe basic hardware and software problems using accurate terminology.
8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network.
8.1.2.NI.2: Describe how the Internet enables individuals to connect with others worldwide.
8.1.2.NI.3: Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others.
8.1.2.NI.4: Explain why access to devices need to be secured.
8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.
8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.
8.1.2.DA.2: Store, copy, search, retrieve, modify, and delete data using a computing device
8.1.2.DA.3: Identify and describe patterns in data visualizations.
8.1.2.DA.4: Make predictions based on data using charts or graphs.
8.1.2.AP.1: Model daily processes by creating and following algorithms to complete tasks.
8.1.2.AP.2: Model the way programs store and manipulate data by using numbers or other symbols to represent information.
8.1.2.AP.3: Create programs with sequences and simple loops to accomplish tasks.
8.1.2.AP.4: Break down a task into a sequence of steps.
8.1.2.AP.5: Describe a program's sequence of events, goals, and expected outcomes.
8.1.2.AP.6: Debug errors in an algorithm or program that includes sequences and simple loops.

Core Ideas:

- Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.
- A computing system is composed of software and hardware.
- Describing a problem is the first step toward finding a solution when computing systems do not work as expected.
- Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide.
- Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access.
- Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools).
- Individuals collect, use, and display data about individuals and the world around them.
- Computers store data that can be retrieved later. Data can be copied, stored in multiple locations, and retrieved.
- Data can be used to make predictions about the world.
- Individuals develop and follow directions as part of daily life. A sequence of steps can be expressed as an algorithm that a computer can process.
- Real world information can be stored and manipulated in programs as data (e.g., numbers, words, colors, images).

- Computers follow precise sequences of steps that automate tasks.
- Complex tasks can be broken down into simpler instructions, some of which can be broken down even further.
- People work together to develop programs for a purpose, such as expressing ideas or addressing problems. The development of a program involves identifying a sequence of events, goals, and expected outcomes, and addressing errors (when necessary).

Knowledge, Skills, and Instructional Objectives:
Students will be able to:

- Select and operate a variety of computing devices based on user needs and preferences
- Identify the functions of common software and hardware components of computing systems
- Describe basic hardware and software problems using accurate terminology
- Describe how individuals use computers to connect to other individuals, places, information, and ideas through a network
- Describe how the Internet enables individuals to connect with others worldwide
- Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others
- Explain why access to devices need to be secured
- Compare how individuals live and work before and after the implementation of new computing technology
- Collect and present data, including climate change data, in various visual formats
- Store, copy, search, retrieve, modify, and delete data using a computing device
- Identify and describe patterns in data and make predictions based on data using charts or graphs
- Model daily processes by creating and following algorithms to complete tasks
- Model the way programs store and manipulate data by using numbers or other symbols to represent information (Code)
- Create programs with sequences and simple loops to accomplish tasks (Code)
- Break down a task into a sequence of steps, then describe a program's sequence of events, goals, and expected outcomes
- Debug errors in an algorithm or program that includes sequences and simple loops.

Instructional Materials/Resources:

- Various types of computing devices (laptop, Chromebook, iPad, etc.)
- Various Coding programs

Suggested Vocabulary:
Computing systems, internet, network, code, algorithm, data, analysis, program

Career Readiness:
9.1.2.CR.2: Recognize ways to volunteer in the classroom, school and community.
9.1.2.CR.2: List ways to give back, including making donations, volunteering and starting a business.

Recommended Instructional Activities:

- Provide visual and tactile reference to various computer systems and computer system software and hardware

- Model program operations
- Use data supplied to manipulate and create various visual forms
- Create and manipulate Code to create a desired design or project

Extension Strategies/Activities:	**Modification Strategies/Activities:**
● Create a picture using student created Code ● Develop an idea for a new "App"	● Highlight important information ● Books on tape ● Leveled readers ● Reading window ● Pair visual learners with auditory learners ● Provide alternate form or assessment IE: projects, dioramas ● Pair low level readers with high level readers ● Retell story by drawing or speaking ● Visual aids ● Advance notice for tests ● Provide a copy of notes ● Provide study guide ● Modified tests as needed

Suggested Assessments:
Performance Task:

- Anecdotal Records
- Manipulated data
- Utilization of Code to create a desired outcome

Theme/Unit: **Computing Systems, Networks and the Internet, Impacts of Computing, Data & Analysis, Algorithms & Programing**	**Suggested Sequence:** **Ongoing**

New Jersey Student Learning Performance Expectations:

8.1.5.CS.1: Model how computing devices connect to other components to form a system.
8.1.5.CS.2: Model how computer software and hardware work together as a system to accomplish tasks.
8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.DA.2: Compare the amount of storage space required for different types of data.
8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data. •
8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.
8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.
8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.
8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development.
8.1.5.AP.5: Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program.
8.1.5.AP.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.

Core Ideas:

- Computing devices may be connected to other devices to form a system as a way to extend their capabilities.
- Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information).
- Shared features allow for common troubleshooting strategies that can be effective for many systems.
- Information needs a physical or wireless path to travel to be sent and received.
- Distinguishing between public and private information is important for safe and secure online interactions.
- Information can be protected using various security measures (i.e., physical and digital).
- The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently.
- Data can be organized, displayed, and presented to highlight relationships.
- The type of data being stored affects the storage requirements.
- Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.
- Many factors influence the accuracy of inferences and predictions.
- Different algorithms can achieve the same result.

- Some algorithms are more appropriate for a specific use than others.
- Programming languages provide variables, which are used to store and modify data.
- A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals).
- Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.
- Individuals develop programs using an iterative process involving design, implementation, testing, and review.

Knowledge, Skills, and Instructional Objectives:
Students will be able to:

- Identify how computing devices connect to other components to form a system
- Identify how computer software and hardware work together as a system to accomplish tasks
- Identify potential solutions for simple hardware and software problems using common troubleshooting strategies
- Develop models that successfully transmit and receive information using both wired and wireless methods
- Describe physical and digital security measures for protecting sensitive personal information
- Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes
- Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of user
- Collect, organize, and display data in order to highlight relationships or support a claim
- Compare the amount of storage space required for different types of data
- Organize and present collected data visually to communicate insights gained from different views of the data
- Organize and present climate change data visually to highlight relationships or support a claim
- Identify cause and effect relationships, predict outcomes, or communicate ideas using data
- Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
- Create programs that use clearly named variables to store and modify data
- Create programs that include sequences, events, loops, and conditionals
- Break down problems into smaller, manageable sub-problems to facilitate program development
- Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program
- Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended

Instructional Materials/Resources:

- Various types of computing devices (laptop, Chromebook, iPad, etc.)
- Various Coding programs

Suggested Vocabulary:
Personal information, sensitive information, computer system, security, accessibility

Career Readiness:
9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors

	9.1.5.FP.5: Illustrate how inaccurate information is disseminate through various external influences including the media, advertisers/marketers, friends, educators, and family members

Recommended Instructional Activities:

- Provide visual and tactile reference to various computer systems and computer system components
- Create potential solutions for simple hardware and software problems using common troubleshooting strategies
- Use data supplied to manipulate, create and determine outcomes
- Create and manipulate Code to create a desired design or project

Extension Strategies/Activities:	**Modification Strategies/Activities:**
● Use various methods to showcase data in various forms ● Use multimedia to show how technology is evolving over time ● Use Code to create a new program or program idea ● Create a "Help" guide to solve typical problems involving computer systems	● Highlight important information ● Books on tape ● Leveled readers ● Reading window ● Pair visual learners with auditory learners ● Provide alternate form or assessment IE: projects, dioramas ● Pair low level readers with high level readers ● Retell story by drawing or speaking ● Visual aids ● Advance notice for tests ● Provide a copy of notes ● Provide study guide ● Modified tests as needed

Suggested Assessments:
Performance Task:

- Anecdotal Records
- Manipulated data
- Utilization of Code to create a desired outcome

Theme/Unit: **Computing Systems, Networks and the Internet, Impacts of Computing, Data & Analysis, Algorithms & Programing**	**Suggested Sequence:** **Ongoing**

New Jersey Student Learning Performance Expectations:

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.1.8.CS.2: Design a system that combines hardware and software components to process data.
8.1.8.CS.3: Justify design decisions and explain potential system trade-offs.
8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
8.1.8.NI.1: Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.
8.1.8.NI.2: Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
8.1.8.NI.3: Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems.
8.1.8.NI.4: Explain how new security measures have been created in response to key malware events.
8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.
8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies.
8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed.
8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.
8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
8.1.8.DA.5: Test, analyze, and refine computational models.
8.1.8.DA.6: Analyze climate change computational models and propose refinements.
8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
8.1.8.AP.2: Create clearly named variables that represent different data types and perform operations on their values.
8.1.8.AP.3: Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
8.1.8.AP.4: Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.
8.1.8.AP.5: Create procedures with parameters to organize code and make it easier to reuse.
8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users.
8.1.8.AP.7: Design programs, incorporating existing code, media, and libraries, and give attribution.
8.1.8.AP.8: Systematically test and refine programs using a range of test cases and users.
8.1.8.AP.9: Document programs in order to make them easier to follow, test, and debug.

Core Ideas:

- The study of human–computer interaction can improve the design of devices and extend the abilities of humans.
- Software and hardware determine a computing system's capability to store and process information. The design or selection of a computing system involves multiple considerations and potential trade-offs.
- Troubleshooting a problem is more effective when knowledge of the specific device along with a systematic process is used to identify the source of a problem.
- Protocols, packets, and addressing are the key components for reliable delivery of information across networks.

- The information sent and received across networks can be protected from unauthorized access and modification in a variety of ways.
- The evolution of malware leads to understanding the key security measures and best practices needed to proactively address the threat to digital data.
- Advancements in computing technology can change individuals' behaviors.
- Society is faced with trade-offs due to the increasing globalization and automation that computing brings.
- People use digital devices and tools to automate the collection, use, and transformation of data.
- The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.
- Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals. Data is organized and accessible based on the application used to store it.
- The purpose of cleaning data is to remove errors and make it easier for computers to process.
- Computer models can be used to simulate events, examine theories and inferences, or make predictions.
- Individuals design algorithms that are reusable in many situations.
- Algorithms that are readable are easier to follow, test, and debug.
- Programmers create variables to store data values of different types and perform appropriate operations on their values.
- Control structures are selected and combined in programs to solve more complex problems.
- Programs use procedures to organize code and hide implementation details. Procedures can be repurposed in new programs. Defining parameters for procedures can generalize behavior and increase reusability.
- Individuals design and test solutions to identify problems taking into consideration the diverse needs of the users and the community.

Knowledge, Skills, and Instructional Objectives:
Students will be able to:

- Recommend improvements to computing devices in order to improve the ways users interact with the devices
- Design a system that combines hardware and software components to process data, justify design decisions and explain potential system trade-offs
- Apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems
- Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination
- Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication
- Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems
- Explain how new security measures have been created in response to key malware events
- Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options
- Identify issues of bias and accessibility in the design of existing technologies

- Organize and transform data collected using computational tools to make it usable for a specific purpose
- Explain the difference between how the computer stores data as bits and how the data is displayed
- Identify the appropriate tool to access data based on its file format
- Transform data to remove errors and improve the accuracy of the data for analysis
- Test, analyze, and refine computational models
- Analyze climate change computational models and propose refinements
- Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode
- Create clearly named variables that represent different data types and perform operations on their values
- Design and develop programs that combine control structures, including nested loops and compound conditionals
- Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs
- Create procedures with parameters to organize code and make it easier to reuse
- Refine a solution that meets users' needs by incorporating feedback from team members and users.
- Design programs, incorporating existing code, media, and libraries
- Systematically test and refine programs using a range of test cases and users
- Document programs in order to make them easier to follow, test, and debug

Instructional Materials/Resources:

- Various types of computing devices (laptop, Chromebook, iPad, etc.)
- Various programs and software
- Various forms of data

Suggested Vocabulary:
Computing systems, protocol, bias, network security, computational model, file format

Career Readiness:
9.1.8.CR.2: Compare various ways to give back through strengths, passions, goals and other personal factors
9.1.8.CP.1: Compare prices for the same goods or services
9.1.8.EG.9: Identify types of consumers fraud, the process for reporting fraud, the specific consumer protection laws, and the issues they address
9.1.8.FP.6: Compare and contrast advertising messages to understand what they are trying to accomplish
9.1.8.FP.7: Identify the techniques and effects of deceptive advertising.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location and past experiences.
9.1.8.PB.7: Brainstorm techniques that will help decrease expenses including comparison shopping, negotiating, and day-to-day expense management.
9.1.8.RM.3: Evaluate the need for different types of warranties

Recommended Instructional Activities:

- Design a system that combines hardware and software components to process data
- Transform data to remove errors and improve the accuracy of the data for analysis
- Test, analyze, and refine computational models
- Use data supplied to manipulate, create and determine outcomes
- Design and develop programs that combine control structures, including nested loops and compound conditionals
- Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs
- Create and manipulate Code to create a desired design or project

Extension Strategies/Activities:

- Use multimedia to show how technology is evolving over time
- Use various technologies to create and evaluate an application or program
- Create a user guide for common computer programs and applications
- Use a design application to create a 3-dimensional product or design

Modification Strategies/Activities:

- Highlight important information
- Books on tape
- Leveled readers
- Reading window
- Pair visual learners with auditory learners
- Provide alternate form or assessment IE: projects, dioramas
- Pair low level readers with high level readers
- Retell story by drawing or speaking
- Visual aids
- Advance notice for tests
- Provide a copy of notes
- Provide study guide
- □ Modified tests as needed

Suggested Assessments:
Performance Task:

- Anecdotal Records
- Manipulated data
- Utilization of Code to create a desired outcome

Support Documents

Board Policies Applicable to Curriculum

2110 PHILOSOPHY OF EDUCATION

Free public education for all children is a cornerstone of a democratic society that values the worth and dignity of each individual. The primary goal of this Board of Education shall be to offer each child in this district the educational opportunity that will enable him/her to function politically, economically, and socially in that democratic society.

The Board, as the agent responsible for the education of the children of the district, will provide a planned program of learning that incorporates into its curriculum the lessons and experiences, within and without the classroom, needed to realize the educational goals of this district. The Board appreciates the need for constant improvement of the instructional program and will strive unremittingly to provide an educational system that assists each pupil in becoming a self-respecting individual who can function effectively and satisfyingly.

It is the expectation of this school district that all pupils achieve the New Jersey Core Curriculum Content Standards at all grade levels.

The Board will seek out and work cooperatively with the available resources of home and community including business and industry, in the improvement of the educational program.

The Board will endeavor to employ a high caliber, well-prepared staff of adequate size and wide-ranging abilities. Moreover, the Board will provide pupils and staff, as needs dictate and means permit, with adequate educational supplies, equipment, and facilities.

The purpose of education in the schools of this district is to facilitate the development of each child to his/her greatest potential. The school staff shall recognize individual differences among pupils and encourage their achievement and progress, not only in basic skills but in the ability to think independently and critically. The school staff shall help pupils to understand our democratic society; to believe in it and to act fairly in their relationships with others; to develop in themselves attitudes of respect and helpfulness toward others; to want, and to be able to perform well, some portion of the work of the world; to acquire knowledge and skills necessary to do this with satisfaction to themselves and society; to understand and use effective methods in framing the questions and tackling the problems that they encounter in their lives to the end that they may function politically, economically, and socially in a democratic society.

Adopted: 11 November 2008

2132 SCHOOL DISTRICT GOALS AND OBJECTIVES

The Board of Education adopts the following goals and objectives for the operation of the educational program of the school district:

1. Student Achievement:

Continue to implement formative and on-line assessments of student performance in order to ensure that our programs and their execution meet the expectations set forth in the Common Core State Standards.

2. Community Engagement:

Improve the frequency, quality and consistency of communication that will enhance parent and community involvement.

3. Human Resources:

Continue to work toward matching our community and student diversity in our staff.

N.J.A.C. 6A:32-12.2

Adopted: 8 September 2014

2200 CURRICULUM CONTENT
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The Board of Education will provide the instruction and services mandated by law and rules as necessary for the implementation of a thorough and efficient system of free public education and such other instruction and services as the Board deems appropriate for the thorough and efficient education of the students of this district. The Board shall annually approve a list of all programs and courses that comprise the district's curriculum and shall approve any subsequent changes in the curriculum in accordance with Policy 2220.

For purposes of this policy “curriculum” means planned learning opportunities designed to assist students toward the achievement of the intended outcomes of instruction.

The curriculum will be reviewed by the Superintendent and approved annually by the Board. In accordance with law, the curriculum shall, as a minimum, include the curricular mandates of N.J.S.A. 18A - Education and N.J.A.C. 6 and 6A - Education and all of the New Jersey Core Curriculum Content Standards and Cumulative Progress Indicators.

The Superintendent is responsible for implementing the curriculum approved by the Board.

The Board directs the curriculum be consistent with the educational goals and objectives of this district, the New Jersey Core Curriculum Content Standards and responsive to identified student needs. The Superintendent shall, in consultation with teaching staff members, assure the effective articulation of curriculum across all grade levels, between the schools of this district, and among the constituent districts of the Rancocas Valley Regional School District.

The curriculum shall provide programs in accordance with Board policies and the New Jersey Student Learning Standards, including but not limited to:

1. Preparation of all students for employment or post secondary study upon graduation from high school;

2. Instruction in workplace readiness skills, visual and performing arts, comprehensive health and physical education, language arts literacy, mathematics, science, social studies (including instruction on the Constitution of the United States, United States history, Community Civics, and the geography, history and civics of New Jersey), and World Languages;

3. Continuous access to sufficient programs and services of a library/media facility, classroom collection, or both, to support the educational program of all students in accordance with Policy 2530;

4. Guidance and counseling to assist in career and academic planning for all students, in accordance with Policy 2411;

5. A continuum of educational programs and services for all children with disabilities, in accordance with Policy and Regulation 2460;

6. Bilingual education, English as a Second Language, and English language services for students of limited English language proficiency, when the number of such students so necessitates, in accordance with Policy 2423;

7. Programs and services for students at risk who require remedial assistance in accordance with Policies 2414, 2415, and 5460;

8. Equal educational opportunity for all students in accordance with Policies 2260, 5750, and 5755;

9. Career awareness and exploration as required, and vocational education as appropriate;

10. Educational opportunities for students with exceptional abilities, in accordance with Policy 2464;

11. Instruction in accident and fire prevention;

12. A substance abuse prevention program;

13. A program for family life education; and

14. Programs that encourage the active involvement of representatives from the community, business, industry, labor and higher education in the development of educational programs aligned with the standards.

N.J.S.A. 18A:6-2; 18A:6-3; 18A:35-1 et seq.

N.J.A.C. 6A:8-1.1 et seq.; 6A:14 et seq.

New Jersey Core Curriculum Content Standards

Adopted: 14 November 2016

2210 CURRICULUM DEVELOPMENT
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The Board of Education is committed to the continuing improvement of the educational program of the district. To this end, the curriculum shall be evaluated and modified in accordance with a plan for curriculum development.

As educational leader of the district, the Superintendent shall be responsible to the Board for the development of curriculum and shall establish procedures for curriculum development that insure the effective participation of teaching staff members, pupils, the community, and members of the Board.

The Superintendent shall report to the Board the objectives, evaluative criteria and costs of each proposed program before seeking Board adoption. New programs and courses of study shall not be acted upon by the Board until the meeting following their presentation, in order for Board members to have an opportunity to review the proposed program.

Criteria by which the Board will judge the acceptability of new course offerings include:

1. Does it address an identified pupil need?

2. Is it relevant to the Board's philosophy and goals and does it offer real possibilities for progress toward these goals?

3. If the proposed course replaces an existing program, what defect in the previous program is it designed to overcome?

4. Does it include the criteria by which progress can be measured?

5. Has it been thoroughly studied and/or tested by district staff or by another district? What were the results?

6. Has a curriculum guide been completed? If not, when can it be expected?

7. Have the associated textbooks been recommended to the Board?

8. Have the costs and time of implementation including in-service training been reviewed?

A five-year plan for updating curriculum shall be developed and implemented. The Superintendent shall report annually on all progress in curriculum development and the implementation of the five-year curriculum plan at the time of the Board's annual adoption of curriculum.

The Superintendent may conduct experimental programs that are not part of the duly adopted curriculum and are deemed to be necessary to the continuing growth of the instructional program; he or she shall report to the Board any such pilot program conducted, along with its objectives, evaluative criteria, and costs, before each such program is initiated.

The Superintendent shall report to the Board periodically on all progress in curriculum development.

Adopted: 2 May 2000

2220 ADOPTION OF COURSES
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The Board of Education shall provide a comprehensive instructional program to serve the needs of the children of this district. In furtherance of this goal and pursuant to law, the Board shall annually adopt the existing courses of study. Adoption includes both content and credit allocation. The Board's policy in this respect is to:

1. Adopt those core content standards mandated by the state in a form acceptable to the State Department of Education.

2. Adopt additional core content standards to meet the changing needs of pupils and the community.

3. Adapt and revise existing courses of study to meet the changing needs of pupils and the community.

Existing courses shall be reviewed at regular intervals and revised as necessary. No course of study shall be eliminated, revised or implemented without the approval of the Board.

The Board directs that the curriculum of this district:

1. Be consistent with written goals, objectives and identified pupil needs;

2. Develop individual talents and interests and serve diverse learning styles to motivate pupil achievement;

3. Provide for continuous learning through effective articulation;

4. Provide all pupils continuous access to sufficient programs and services of a library/media facility, classroom collection, or both, to support the educational program;

5. Provide all pupils guidance and counseling to assist in career and academic planning;

6. Provide a continuum of educational programs and services for handicapped children, pursuant to law and regulation;

7. Provide bilingual programs for pupils whose dominant language is not English, pursuant to law and regulation;

8. Provide compensatory education programs for pupils, pursuant to law and regulation;

9. Provide all pupils equal educational opportunity, pursuant to law and regulation;

10. Provide career awareness and vocational education, pursuant to law and regulation;

11. Provide educational opportunities for exceptionally gifted and talented pupils.

The Superintendent shall maintain a current list of all courses of study offered by this district; shall furnish each member of the Board of Education with a copy upon request; and shall provide a copy in the district office for public referral.

Adoption of courses shall be by a recorded roll call majority vote of the full membership of the Board. This includes the courses in the special education and ESL/bilingual programs, and those for the adult high school.

N.J.S.A. 18A:4-25; 18A:4-28; 18A:7A-6; 18A:33-1;
18A:35-1 et seq.
N.J.A.C. 6:4-1.1 et seq.; 6:8-4.6; 6:8-7.1; 6:39-1.2

Adopted: 2 May 2000

2230 COURSE GUIDES

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The Superintendent shall oversee development of curriculum guides for every course and area of study for every grade level. Each guide shall contain objectives for concepts and skills to be taught and attitudes to be developed; necessary study skills; suggested materials and activities designed to achieve all of these; and evaluation criteria intended to test the extent to which learning objectives have been met.

Teachers shall use the guides as the core of their instructional planning. It shall be the responsibility of the building principal to ensure that curriculum guides are being followed.

A copy of each guide in use shall be kept on file in each school office. Such guides shall be available for inspection.

Because curriculum guides are the means of implementing instruction in courses adopted by the Board as the curriculum of the district, the Board shall approve any new curriculum guides or any revision to an existing guide before they are put into effect.

N.J.S.A. 18A:33-1
Adopted: 2 May 2000

Curriculum Revision Commentary

In order to achieve the district's philosophy of high quality educational experiences for all students, curriculum review and revision must become an ongoing process in Westampton Township Public Schools.

Recommended 5 Year Cycle - In an effort to streamline the process for future curriculum review and revision, the following five-year curriculum revision cycle will be implemented:

Year 1: Curriculum Evaluation and Development

- Examine the state statues, state administrative code, and board policy to ensure compliance and develop direction for curriculum revision.
- Research current data, trends, and best practices in the content area.
- Complete curriculum audit, including teacher surveys and discussions, to determine curriculum strengths and areas of concern
- Develop K-8 curriculum maps in the respective content area
- Determine learning outcomes, and assessments based on state standards
- Select and purchase new programs and materials, if necessary
- Plan district wide articulation sessions focusing on new initiatives

Year 2: Initial Implementation and Revision

- Create a new curriculum draft
- Plan professional development to facilitate the implementation of new instructional practices and programs relative to the new curriculum.
- Provide professional development for administrators to support the implementation and supervision of new curriculum.
- Use teacher feedback and recommendation to support revisions of the curriculum draft.
- Include additional instructional activities, cross-curricular connections and technology to move the document from being a work in progress to a finished product.
- Begin collecting and analyzing data to determine impact of new curriculum on student learning.

Years 3 and 4: Full Implementation

- Implement revisions to the curriculum
- Monitor the implementation of curriculum with the new revisions.
- Continue to provide support and staff development
- Identify further areas of revision and amend the curriculum, if necessary.
- Continue to collect and analyze data to determine the impact of curriculum on student learning.

Year 5: Full Implementation/Revision Planning

- Monitor the implementation of curriculum with the new revisions.
- Continue to provide support and staff development
- Identify further areas of revision and amend the curriculum, if necessary.
- Continue to collect and analyze data to determine the impact of curriculum on student learning.
- Plan for new curriculum revision cycle/curriculum evaluation and development.

It is important to note, however, that recent changes in NJ legislature states that if the NJSLS standards change, no district will be allowed to wait until they are in a curriculum revision year (i.e. year 5 of a five-year curriculum revision cycle) to revise the affected curriculum. Districts will have twelve months from the date the new standards are adopted to update and amend their curriculum documents.

Modifications and Extensions: A Guide for Differentiated Instruction

(Formerly Instructional Adaptations in the Classroom for Students with Diverse Needs)

Introduction

The students populating U.S. classrooms today are a diverse lot. They come from differing cultures and have differing learning styles. They arrive at school with differing levels of emotional and social maturity. Their interests differ greatly, both in topic and intensity. At any given time, they reflect differing levels of academic readiness in various subjects-and in various facets of a single subject.

In life, kids can choose from a variety of clothing to fit their differing sizes, styles, and preferences. We understand, without explanation, that this makes them more comfortable and gives expression to their developing personalities. In school, modifying or differentiating instruction for students of differing readiness and interests is also more comfortable, engaging, and inviting. One-size-fits-all instruction will inevitably sag or pinch-exactly as single-size clothing would-student who differ in need, even if they are chronologically the same age.

While the goal for each student is challenge and substantial growth, teachers must often define challenge and growth differently in response to students' varying interests and readiness levels.

– Carol Ann Tomlinson; How to Differentiating Instruction in Mixed-Ability Classrooms

The concept of differentiation, also referred to "differentiating instruction", "differentiated instruction", "differentiated learning", "adaptations", has become an important conversation in teaching and learning. This places students at the center of teaching and learning and upholds data and student needs as the vehicle to drive instructional planning and practices.

"Differentiating the curriculum" requires qualitative, proactive, and multiple approaches to learning in an effort to provide appropriate adjustments to content, teaching strategies, expectations of student mastery, and scope and sequence.

In a differentiated classroom, students work at different paces, have different strengths, and therefore, need instruction that is tailored to meet their individual needs. This need for differentiation is magnified when students have disabilities, are limited in English proficiency, or are advanced and need to be challenged academically to maintain motivation for learning.

This document is designed to offer support to teachers as a resource for strategies to use in their classroom considering that most classroom contain a broad range of levels, skills, and interests. Please note that while this document is categorized to reflect specific student subgroups, many of the strategies can overlap and prove to be effective instructional practices for all students.

Students with Disabilities

Student Motivation

Rationale: Some students with disabilities may be reluctant to engage or persist in language arts literacy activities. This reluctance may be due to difficulties with aspects of language or literacy processes resulting in repeated failures despite students' initial efforts and desire to learn. Because of these difficulties motivational strategies are important to help students with disabilities become successfully involved in a variety of literacy experiences to develop proficiency, confidence, and enjoyment.

Purpose:	*Strategies:*
Create interest	Personally meaningful activity
Develop persistence	Activity choice
Build confidence	Hands-on, multimodal activities
Promote enjoyment	"Doable" tasks
Foster independence	Attention to learning style
	Student involvement in goal setting
	Modified assessment activities
	Choice to work with others or alone

Instructional Presentation

Rationale: Students with disabilities may require instructional presentations that will enable them to acquire, comprehend, recall, and apply science content and related processes. In addition, instructional presentation adaptations can enhance a student's attention and ability to focus on instruction.

The primary purpose of these adaptations is to provide special education students with teacher-initiated and teacher-directed interventions that prepare students for learning and engage students in the learning process (*Instructional Preparation)*; structure and organize information (*Instructional Prompts)*; foster understanding of new concepts and processes (*Instructional Application)*; and promote student self-reflection and self-management regarding tasks demands, goal attainment, and performance accuracy (*Instructional Monitoring)*.

Instructional Preparation

Purpose:	*Examples:*
Motivate	Previewing information/materials
Establish purpose and goals of lesson	Advanced organizers
Activate prior knowledge	Brainstorming and webbing
Build background	Questioning techniques
Focus	K-W-L strategies
Organize	Warm-ups
	Visual demonstrations, illustrations, models
	Mini-lessons

Instructional Prompts

Purpose:	*Examples:*

Organize information
Build whole-part relationships
Cue associations and connections
Highlight essential concepts
Generate categorization and comparisons
Activate recall
Summarize

Graphic organizers
Semantic organizers
Outlines
Mnemonics
Analogies
Feature analysis
Color coding
Key words/Labels
Writing frames/templates
Restating/clarifying oral directions
Cue Cards
Pictures
Movement cues
Notetaking guides
Segmenting/chunking tasks
Directions on overhead/board

Instructional Application

Purpose:
Simplify abstract concepts
Provide concrete examples
Extend ideas and elaborate understanding
Build connections and associations
Relate to everyday experiences
Promote generalization
Engage multiple modalities

Examples:
Graphics and charts
Data charts
Flow charts
Drawings and other illustrations
Dramatics – role play
Props and manipulatives
Field trips
Games and puzzles
Models
Interviews/surveys
Think aloud - modeling
Simulations
Hands-on activities
Constructions
Dramatizations
Music and movement
Concept activities
Application activities
Real-life applications (write letter to editor)

Instructional Monitoring

Purpose:
Provide checks for understanding
Redirect attention
Direct on-task behavior

Examples:
Self-monitoring checklists
Think-aloud
Journal entries

Promote participation
Check progress
Assist in goal setting
Establish timelines
Clarify assignments, directions, and directions
Provide reinforcement and corrective feedback
Promote strategy use and generalization
Manage student behavior and interactions
Develop self-questioning and self-regulation

Portfolios
Interviews
Questioning techniques
Student contracts
Reward system

Instructional Grouping

Purpose:
Cooperative learning groups
Peer partners
Buddy Systems
Teams

Examples:
Assist physically
Clarify
Prompt cue
Gestures and signals
Interpret
Reinforce
Highlight
Organize
Focus

Student Response

Rationale: Students with disabilities may require specific adaptations in order to demonstrate acquisition, recall, understanding, and application of language arts and other content area procession in a variety of situations with varied materials while they are developing proficiencies in these areas.
The primary purpose of student performance responses is to provide students with disabilities a means of demonstrating process toward the lesson objectives related to the New Jersey Student Learning Standards.

Response Format Adaptation Examples:

- Dictation
- Use of PC/multimedia for composition of response
- Video and audiotapes
- Braille writing
- Signing with Interpretation
- Information and graphic organizers
- Illustrations
- Diagrams
- Construction – models, dioramas, mobiles
- Songs, raps, and/or poems

- Brochure
- Game or puzzle
- Flip book
- Create test questions

Response Procedure Adaptation Examples:

- Extended time
- Practice Exercises
- Interpreter
- Use of preferred response format

Limited English Proficiency Students

Teachers need to use a variety of strategies for monitoring student progress and to adjust their strategies and expectations to fit the level of language proficiency of the English language learner. With beginning language learners, emphasis should be on comprehension of named things and actions; more advanced students should begin demonstrating understanding of connections between things and subsequently their ability to articulate the relationship between ideas. Content area teachers should work closely with the bilingual/ESL teacher to identify instructional and assessment strategies that are appropriate to all aspects of the student's development and that permit teachers to expand expectations gradually over the school year.

Successful strategies for monitoring student progress in the content areas include:

- Providing periodic checks for understanding.
- Promoting nonverbal as well as verbal participation.
- Encouraging students to think aloud to practice concepts.
- Modeling responses that provide appropriate information using correct grammar.
- Breaking tasks down into sequentially developed parts using simple language.
- Structuring questions to student's language level (e.g., begin with yes/no and embedded questions and advance to open-ended questions).
- Avoiding use of questioning techniques that contain negative structures, such as "all but", "everything is _____ except", or "one is NOT the reason/cause."
- Rephrasing questions and information when students do not understand the first time.
- Observing student's behaviors for evidence that they understand assignments, directions, and instructions.
- Reviewing student's work for evidence that they understand assignments, directions, and instructions.

- Using visual reviews (e.g., lists and charts) that enable students to show what they know and can do.
- Providing increased "wait time" to allow students time to process questions before responding.
- Providing modified "double" grading to assess the content as well as the structure of responses.

Four over-arching strategies are most effective for assisting students from a background of limited English proficiency (LEP) to meet success in content area classes. These strategies include the following:

- integrate activities into thematic units
- tap students' prior knowledge and experience
- teach learning strategies and scaffold complex tasks
- group students into a variety of learning groups

Academically Talented Learners

Academically talented learners, also known as "gifted learners" or "gifted and talented," are oftentimes overlooked in classroom instruction. Consequently, some students find school boring and uninspiring due to knowing many of the concepts being introduced in the regular classroom. The exceptionally able or gifted students are those who

- demonstrate a high degree of intellectual, creative, and/or artistic ability
- possess exceptional leadership skills
- excel in specific fields
- function above grade level
- need accommodations or special instruction to achieve at levels commensurate with a challenge to his or her abilities
- have the ability to grasp concepts rapidly and/or intuitively
- have an intense curiosity about principles and how things work
- have the ability to generate theories and hypotheses and purse methods of inquiry
- produce products that express insight, creativity and/or excellence

In the past, the term "gifted" described people with high scores on I.Q. tests. Today, new concepts connected to creative thinking models and multiple intelligences have expanded the definition of intelligence to include other dimensions. Giftedness reflects a multifaceted, multicultural, and multidimensional perspective and is defined by aptitude, traits, and behaviors rather than changeless test performance. These students are found in all cultural groups and across all economic levels. Increased

understanding of culturally determined and environmentally affected behaviors will enable teachers and administrators to interpret performance indicators of creative potential.

Strategies for Academically Talented Learners

Gifted students are more likely to develop study and production skills, experience success and struggle, and feel challenged in a classroom setting that encourages learners to master information more quickly.

Adaptation strategies include the following:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- community involvement
- cultural diversity
- internship, mentorship, and other forms of apprenticeship

Miscellaneous/All Learners

Adaptations in the Classroom Environment

- Classical background music to enhance concentration
- Variety of workspace arrangement (individual, small, and large group)
- Privacy work seats – carrels
- Conferencing area for one-on-one teacher/student interaction
- Charts and poster to enhance memory and self-reliance
- Organization tools – labeled bins or cabinets for materials, assignments, or supplies
- Seating arrangements – minimize distractions, provide positive student models

Adaptive Equipment and Instructional Materials

- Leveled classroom libraries
- Books on tape

- Directions on tape
- Tape recorders
- Simplified written directions
- Adjusted formats of text
- Computers with adaptive software
- Speech synthesizer
- Communication boards
- Close-captioned video/television

Modifications and Extensions: A Guide for Differentiated Instruction **is a compilation of classroom practices with consultation from multiple sources, including the New Jersey Curriculum Framework.**