Washington Township Public Schools
COURSE OF STUDY – CURRICULUM GUIDE

Course: Computer Systems and Video Game Design

Written By: Simone Scafide

Under the Direction of: Steve Whalen

Description: Students will learn basic programming and how logic applies to video games. Students will learn the history of video games, programming, and the impact that video games have had on society. Using the program GameMaker, students will have the opportunity to create their own school appropriate games, and use critical thinking skills to debug programs. Students will create games to be played on the personal computer, so basic computer systems concepts will be taught, including networking, computer operation and computer care and maintenance. Different career options in video games will be discussed, as well as the opportunities available in computer systems and cyber security.

Jack McGee: *Interim Assistant Superintendent for Curriculum & Instruction*
Gretchen Gerber: *Director of Elementary Education*
Cleve Bryan: *Interim Director of Secondary Education*

Written: August, 2015
Revised:
BOE Approval: SEPTEMBER, 2015

DEMONSTRABLE PROFICIENCIES

I. CLASSWORK REQUIREMENTS

A. Students must be attentive and effectively following directions
B. Students must exhibit responsibility by bringing the necessary materials to class
C. Student resource materials should be legible, well organized, and attention to detail must be noted
D. Homework is a regular requirement
E. Short-term problem applications will be assigned when appropriate
F. A culminating long-term business simulation will be assigned during the last marking period and is a major part of the graded work for the course
G. Quizzes and tests are teacher prepared instruments and usually administered after each chapter introduction of a unit

II. ATTITUDE & BEHAVIOR

A. Behavior and class attendance must conform to Board of Education policy.
B. Students must display a readiness to work.
C. Students must actively participate in class through the maintenance of a notebook and teacher directed patterning activities of concepts.
D. Students must adhere to scheduled deadlines.
E. Students must follow oral and written directions accurately.
F. Tolerate routine work without displaying frustration.

III. COURSE OBJECTIVES/OVERVIEW

A. **COURSE CONTENT**: This course is a full year course for 9-12 grade students who wish to be exposed to Computer Systems and Video Game Design. The course covers a basic introduction to computer systems, and video game design. Students will be introduced to the history of video games as well as the skills necessary to create basic video games on GameMaker.

B. SKILLS

a. Organization and self-motivation is required for problem application work.
b. Ability to work individually or in groups to solve problems
c. Practical application of math, science, and communication skills
d. Ability to follow directions and criteria

C. APPRECIATION OF CONCEPTS

a. An appreciation for organization and orderliness of one's materials to enhance the expediency of performing a task.
b. An ability to analyze and reproduce select information.
c. The ability to adjust quickly to equipment, program, and procedure changes.
d. Appreciate how the initial calculation of inaccurate data affects several other areas of problem solving.

IV. ATTENDANCE

Attendance: Refer to Board of Education Policy

V. GRADING PROCEDURES

A. Assessments- 30%

B. Assignments (Classwork/projects/homework) 60%

C. Conduct (Participation/Preparation) 10%

Semester 1 Grade (S1) is calculated: (50% of Y1) MP1=20%, MP2= 20%, Mid-term(X1) exam= 10%

Semester 2 Grade (S2) is calculated: (50% of Y1) MP3= 20%, MP4= 20%, Final (X2) exam = 10%

Final Grade (Y1) is calculated: S1 + S2 = Y1

MAJOR UNITS OF STUDY

Course Title: Computer Systems and Video Game Design (#917)

I. Introduction to Computer Systems and Video Game Design
II. Computer Systems
III. Introduction to Programming
IV. History of Video Game Design
V. Video Game Theory
VI. Graphics and Audio
VII. Creating a Game
VIII. Careers in Computer Systems and Video Game Design

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**

Unit #: Unit 1 **Unit Title:** Introduction to Computer Systems and Video Game Design

Unit Description and Objectives:

The first unit of Computer Systems and Video Game Design introduces students to the course expectations, the classroom, and the emergency procedures. Student's grades will be based on participation, projects, and assignments such as test, quizzes, and classwork. Students will be expected to report to class on time, as per board policy. Students should be familiar with the classroom layout, and any safety equipment in the room. All students will know where to report in the event the fire alarm should sound, or any other drill/emergency takes place. The courses of study for the semester will be reviewed, and students will be asked what roles video games play in our society.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. What are the expectations for the Computer System and Video Game Design course?	1. Students will understand the acceptable behavior for students while in the technology education laboratories. 2. The attendance policy for the high school is set out by the board of education. 3. Evaluation of the student will be based on assessments, assignments, and conduct.	1. What are the behavior expectations for this course? 2. What is the attendance policy for this building? 3. How will the instructor evaluate the student? 4. Why is safety important in the technology education class?
1. What do you do in case of an emergency?	1. There are different procedures for different emergency situations. 2. Around the room there is different equipment that can be used in case of emergency. 3. In the event of an emergency, students should following the appropriate protocol and remain calm.	1. Where do we go if there is a fire? 2. Where do we go if there is an active shooter? 3. What do we do if there are other school emergencies? 4. What should be done if an accident occurs?
1. What roles do video games play in our society?	1. There are many different goals for video games. 2. Video games have different audiences that general correspond to their goals. Understanding the goal and audience for video games can greatly impact the effect video games have on society.	1. What are examples of goals for video games? 2. How can video games be used as a training tool? 3. How can video games be used for marketing or advertising? 4. How can video games be used for education purposes? 5. What factors can change the audience for a video game? 6. What are demographics? 7. What is the ESRB rating? 8. How can different game goals impact society?

CURRICULUM UNIT PLAN

Course Title/Grade: **Computer Systems and Video Game Design (#917) 9-12**

Unit Number/Title: **Unit I- Introduction to Computer Systems and Video Game Design**

Conceptual Lens:

Appropriate Time Allocation (# of Days)**:** 5 days

Primary Content Standards referenced With Cumulative Progress Indicators

8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	**Critical Content (Students Will Know:)**	**Skill Objectives (Students Will Be Able To:)**	**Instructional/Learning Activities & Interdisciplinary Connections**	**Instructional Resources**	**Technology & 21st C Skills Integration (Specify)**	**NJSLS w/ CPI Reference**	**Evaluation/ Assessment:**
Video Games and Society A. Course & Room Orientation 1. The tech lab 2. Safety letter 3. Seating chart B. Course Proficiency 1. Class requirements 2. Attitude / behavior 3. Course objectives 4. Attendance / makeup 5. Grading A. Specific Areas of Study 1. Computer Systems	1.Video games have changed many aspects of American society 3. The layout of the lab 4. That the course requires good behavior, attendance, and class work. 5. The 7 specific areas of study for the course	1. Demonstrate classroom policies and procedures through their attitude and behavior 2. Explain the course proficiencies 3. Show what to do in the event of an emergency or drill 4. Recognize what safety equipment is in the classroom 5. Identify the location of safety equipment in the classroom 6. Show how to operate any	When asked, What roles do video games play in our society? What roles will video games play in our future? Students will write their individual answers. Group discussions of various definitions while listing them on the board. A group tour of the tech. lab and computer resource room. Discussion of safety letter, students will have it signed by their parents. Fill out emergency cards. Assign seating/workstations. Group discussion of course proficiency, discipline, course content	1. Class syllabus 2. Map of the classroom 3. Emergency Procedures book 4. Student handbook	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4) 7 (1,2,5,6)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 CS.5.3.12.C.1	**Formative Assessment:** 1. Class discussions **Summative Assessment** 2. Procedures Quiz 3. Classroom layout Quiz

2. History of Video Games 3. Introduction to Programming 4. Video Game Theory 5. Graphic and Audio 6. Creating a Video Game 7. Careers in Computer Systems and Video Game Design		safety equipment in the event of an emergency 7. Identify the steps that should be followed in the event of an accident or medical emergency in the classroom.	attendance/makeup work and grading. Group discussion of TLA's – Technology learning activities Course outline Methods of evaluation		8 (4,5) 9 (2,5,6) 10 (3,5) 9.3.IT.1-13 Global awareness Environmental literacy Creativity and Innovation Communication Collaboration Flexibility & Adaptability Productivity & Accountability		

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here. Teachers are encouraged to use the Understanding by Design Learning	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all learners can access and participate in learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**
Unit #: Unit 2 **Unit Title:** Computer Systems

Unit Description and Objectives:

This broad introductory unit introduces students to basic electronics, computer systems, and networking as they pertain to video games. Students will first be introduced to electrical energy, parts of an atom, how electrons move on an atomic level, voltage, current and resistance. Students then learn how electricity interacts with the different parts of a computer to provide the desired outputs. How computers communicate with each other, networking, and the OSI model will be covered. By the end of this unit, students will have a broad background in computer systems and networking that can then be applied to video game design and how games run.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. What is electricity?	1. Atoms are made of protons, neutrons, and electrons. 2. Electricity is the flow of electrons from positive to negative. 3. Electricity can be manipulated to send electronic pulses, and used as a form of communication.	1. What is electrical energy? 2. Water pressure expressed in PSI is equal to what value in electronics? 3. What value in electrical energy is equal to gallons per minute in water? 4. How is the opposition to electron flow expressed? 5. Clean electrical power displays what characteristics?
1. How do computers operate?	1. Circuit boards are made up of smaller components that manipulate how electricity flows. 2. Most circuit boards are made of silicon because of its conductive materials. 3. Computer Hardware is the backbone of the Personal Computer 4. Understanding hardware form factors are necessary for successful computer repair and service. 5. Hardware problems must be resolved before software problems can be addressed. 6. In order to be a computer or network professional you must understand how the computer works as a machine.	1. What is computer hardware? 2. Which pieces of hardware are Inputs? 3. Which pieces of hardware are Outputs? 4. Which pieces of hardware function as both inputs and outputs? 5. How does information travel between hardware components?

1. How do computers communicate?	1. Networks provide a way to share data and hardware. 2. The two most common network administration models are peer-to-peer and client/server. 3. The client/server model is centrally administrated the peer-to-peer is not. 4. The three classifications of networks are LAN, MAN, and WAN. 5. The three common cable topologies are star, ring, and bus. 6. The OSI model serves as a guide for troubleshooting and design of network systems.	1. What is a network? 2. What are the advantages of using a computer network system? 3. What are the three classifications of networks? 4. What are the two network strategies? 5. How does a computer access the network?

CURRICULUM UNIT PLAN

Course Title/Grade: Computer Systems and Video Game Design (#917) 9-12

Unit Number/Title: Unit 2- Computer Systems

Conceptual Lens:

Appropriate Time Allocation (# of Days)**:** 20 days

Primary Content Standards referenced With Cumulative Progress Indicators

8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	Critical Content (Students Will Know:)	Skill Objectives (Students Will Be Able To:)	Instructional/Learning Activities & Interdisciplinary Connections	Instructional Resources	Technology & 21st C Skills Integration (Specify)	NJSLS w/ CPI Reference	Evaluation/ Assessment:
Voltage. Amperage Resistance Alternating Current Direct Current Series Circuits Parallel Circuits Motherboards Data Bus Address Bus Control Bus	Electrical Voltage provides the pressure to push electrons through a circuit. Amperes or current is used to express the amount or volume of electrical energy flowing through a circuit. Resistance is the opposition to current flow. Electrical power is expressed in Watts. Computer Hardware is the backbone of the Personal Computer	Define Electrical Energy. Describe the terms ampere, volt, and ohm in relation to electrical energy. Explain the wattage rating of a computer power supply. Identify possible commercial power problems. Explain the use of UPS and power protection devices. Identify major parts of a motherboard. Identify common form factors. Explain motherboard architecture.	Have students build simple circuits and explain what is happening to the electricity as it flows through each aspect of the circuit. Students should be able to construct a circuit from a schematic diagram, and draw a schematic diagram given a circuit. Have students take apart a computer, and identify all parts. Have students analyze the components, and given a budget, what parts could be replaced to enhance the machine. Students should focus on parts to enhance the gaming experience. Students should then reconnect the components to construct the computer.	White board Solder-less breadboards Wiring LED light bulbs Batteries Misc. circuit parts Networking diagrams Computer motherboard examples Computer hard-drives Power supplies Networking wires	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4) 7 (1,2,5,6) 8 (4,5)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 CS.5.1.12.B.1-4 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3 CS5.2.12.D.1-5 CS5.2.12.A.1-3 CS5.2.12.B.1 NJSLS A.CE.4	1. Worksheets 2. Classroom exercises 3. Home work 4. Presentations 5. Engineering Journal 6. Quizzes 7. Lab work 8. Skill assessments 9. 9. Computer Based Practice Tests

Power Bus Electronic Storage Persistent Storage Define Networks Administrative Models Classifications LAN, MAN,WAN Topologies bus, ring, star How networks communicate Network Media Access Methods OSI Model	Understanding hardware form factors are necessary for successful computer repair and service. Hardware problems must be resolved before software problems can be addressed. In order to be a computer or network professional you must understand how the computer works as a machine. Networks provide a way to share data and hardware. The two most common network administration models are peer-to-peer and client/server. The client/server model is centrally administrated the peer-to-peer is not. The three classifications of networks are LAN, MAN, and WAN.	Identify expansion slot architecture. Identify important computer resources and explain what they are used for. Explain CMOS Explain and identify IRQ's Identify and classify various type of memory available. Explain how magnetic principles are used for data storage. Identify and describe network topologies. Describe the communication theory of a network system. Describe the communication principles of the Ethernet system. List and describe the layers of the OSI model. Install a network adapter. List and describe common network protocols. List and describe common network systems. Identify common network cabling materials. Identify networks basic hardware devices.			9 (2,5,6) 10 (3,5) 9.3.IT.1-13 9.3.IT-SUP.1-4 9.3.IT-NET.1-5 Environmental literacy Creativity and Innovation Critical Thinking and Problem Solving Communication Collaboration Flexibility & Adaptability Productivity & Accountability Leadership & Responsibility		

	The three common cable topologies are star, ring, and bus. The OSI model serves as a guide for troubleshooting and design of the network.						

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here. Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all learners can access and participate in	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**

Unit #: Unit 3 **Unit Title:** Introduction to Programming

Unit Description and Objectives:
This unit will introduce students to basics of programming. Students will learn different number systems, how they apply to information technology and computer systems. Students will be able to learn how to convert from one system to another. Standards and the organizations that create the standards will be introduced. Students will know digital logic, including operations of logic gates and Boolean algebra. Different programming languages will be overviewed. Students will begin writing simple programs and exploring If/Then statements.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. How do number systems operate?	1. Numbering systems all act alike. 2. Any value can be converted from one system to another. 3. Computers can only work with the binary system 4. Humans have the ability to work in all systems	1. What are the common numbering systems used in information systems technology? 2. Why must a digital computer operate in the binary system? 3. What is the basis of numbering systems? 4. Why is it necessary to have more than one numbering system? 5. How do you convert from one system to another?
1. What is Boolean algebra?	1. Digital Logic can be used to make decisions. 2. All digital Computers operate on the principles of digital logic. 3. The basis of digital logic and therefore computer logic is the; and, or, and not gates. 4. All decisions can be made using combinations of and, or, and not.	1. How does a computer make decisions? 2. How are complex decisions made? 3. Why is the computer limited to making many small decisions? 4. How can simple sentences be converted to truth tables?

CURRICULUM UNIT PLAN

Course Title/Grade: Computer Systems and Video Game Design (#917) 9-12

Unit Number/Title: Unit 3- Introduction to Programming

Conceptual Lens:

Appropriate Time Allocation (# of Days): 20 days

Primary Content Standards referenced With Cumulative Progress Indicators

8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	Critical Content (Students Will Know:)	Skill Objectives (Students Will Be Able To:)	Instructional/Learning Activities & Interdisciplinary Connections	Instructional Resources	Technology & 21st C Skills Integration (Specify)	NJSLS w/ CPI Reference	Evaluation/ Assessment:
Decimal System Binary System Octal System Hexadecimal System IP Addressing Binary Concept And, Or and Not Functions Boolean Algebra Develop Circuits from Boolean Expressions	Numbering systems all act alike. Any value can be converted from one system to another. Computers can only work with the binary system. Humans have the ability to work in all systems. Digital Logic can be used to make decisions. All digital computers operate on the principles of digital logic	Operate within all numbering systems. Convert from any system to any other system. Convert simple "English" statements to logical statements. Express statements in terms of logical operators. Draw logic symbols for common logical operators.	Teacher: 1. Lecture/Notes 2. Presentations 3. Demonstrations Students: 1. In class exercises 2. Practical Labs Classroom 1. PC Trainer 2. Lab Companion Workbook Exercises	Conversion charts whiteboard computers electrical components to make circuits	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4) 7 (1,2,5,6) 8 (4,5) 9 (2,5,6)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 CS.7.1.MM.A.1 CS.5.1.12.B.1-4 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3 NJSLS A.CED.1	1. Worksheets 2. Classroom exercises 3. Home work 4. Presentations 5. Engineering Journal 6. Quizzes 7. Lab work 8. Skill assessments 9. Computer Based

Producing Boolean Equation from a given Circuit.	The basis of digital logic and therefore computer logic is the; and, or and not gates All decisions can be made using combinations of and, or, and not.				10 (3,5) 9.3.IT.1-13 9.3.IT-PRG.1-10 Creativity and Innovation Critical Thinking and Problem Solving Communication Collaboration Flexibility & Adaptability Productivity & Accountability Leadership & Responsibility		Practice Tests

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here. Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all learners can access and participate in	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**

Unit #: Unit 4 **Unit Title:** History of Video Games

Unit Description and Objectives:
In this unit, students will be learning about the history of video games. Students need to understand that the roots of popular video games seen today come from some of the very first games created. Students will be required to do research on the first generation of video games, their creators, and the companies that have had great success as well as failures throughout the years. Students will learn about how the world of video games has flourished since they were first introduced and how the community has helped the field grow exponentially.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. What led to the invention of video games?	1. Some of the very first computers built helped lead to the invention of very basic video games. 2. Video games are extensions to multiple computer fields such as computer science and artificial intelligence. 3. Video games are a leisurely activity as well as a hobby people use to pass time.	1. When were video games first introduced? 2. How did computers help create the first basic video games? 3. What were some of the first games ever created? 4. Who were the leading pioneers of the video game industry? 5. Why did it take a while for video games to become popular? 6. Why do people play video games?
1. How have video games evolved since they first came about?	1. The first video games created had a basic concept of input and output commands. 2. Video games started as 2D pixilation before slowly becoming 3D environments. 3. Games were mainly played on computers before consoles were introduced.	1. What types of games were the first generations? 2. What types of games were popular in the different decades leading up to today? 3. What are arcades? 4. When was the first console introduced? 5. How has video game hardware changed? 6. What were some of the most popular consoles and video games in the past?

	4. The amount of genres and types of video games has grown. 5. The introduction of checkpoints/save points has helped increase the length of video games. 6. Video game companies and publishers have grown and adapted to new technology. 7. Technology has helped in the evolution of video games.	7. Which companies/publishers have grown to be a big powerhouse in the video game industry? 8. Who are the 3 biggest names in the industry? 9. What are some of the biggest differences you see when comparing past video games to present ones? 10. How has the price of video games and consoles changed? 11. How has the cost of living effected these prices? 12. What are mobile games?
1. Why are video games so popular?	1. The video game industry and community has grown exponentially since it first started. 2. Video game companies and publishers listen to and try to meet the demands of the community and their fans. 3. Video games are a great way of expressing yourself, meeting new people, hanging out with friends, relieving stress, or just plain having fun. 4. Esports, competitions, making lots of money, and a chance to become famous has attracted people of all ages to video games. 5. Streaming sites such as Twitch has helped connect and spread word of video games to people all over the world. 6. Video games have become so popular that some colleges now offer scholarships for video games.	1. What did people originally think of video games? 2. How have opinions of video games changed? 3. How do the video game companies and publishers communicate with the community and its fans? 4. What are some of the most popular genres of video games? 5. How has the internet helped evolve video games? 6. What are Esports? 7. What are some of the biggest names and teams in Esports? 8. What are the risks of trying to get into Esports? 9. How are Esports and other sports related? 10. How are they different? 11. What are some of the games played as Esports? 12. How have video games impacted society?

CURRICULUM UNIT PLAN

Course Title/Grade: Computer Systems and Video Game Design (#917) 9-12

Unit Number/Title: Unit 4- History of Video Games

Conceptual Lens:

Appropriate Time Allocation (# of Days)**:** 20 days

Primary Content Standards referenced With Cumulative Progress Indicators

8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	Critical Content (Students Will Know:)	Skill Objectives (Students Will Be Able To:)	Instructional/Learning Activities & Interdisciplinary Connections	Instructional Resources	Technology & 21st C Skills Integration (Specify)	NJSLS w/ CPI Reference	Evaluation/ Assessment:
The invention of videos games First games ever created Popular games of the earlier generations of video games Companies and publishers of the past and present Consoles of the past Consoles of the present	1. Video games were originally created on computers 2. Video games did not become very popular until about the 70s and 80s. 3. The pioneers of the video game industry 4. Early popular games include Tetris, Mario, Donkey Kong, Pong, Tic-Tac-Toe, etc. 5. Consoles were not introduced	1. Identify the early stages of video games. 2. Identify the first creators and pioneers of the industry. 3. Identify the first popular games of the field. 4. Identify the biggest companies and publishers in the industry. 5. Identify the first consoles introduced, popular consoles of the past, and the consoles of the present.	There will be multiple class discussions and lectures about the history of video games. These will include topics on the first games created, their creators, companies, and publishers, etc. Students will be given notes and be required to take notes during these discussions. Students are encouraged to participate, share their opinions, critique others, debate, and conduct research on their own. Major discussion: How have video games impacted society? How have opinions of video	1. White Board 2. Google Docs 3. Internet 4. Projector	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 CS1.2.12.A.2 CS.5.1.12.A.1-3 CS.5.3.12.E.1 CS.6.1.12.D.12.C-E	**Formative Assessment:** Class Discussions Group Discussions Summary Readings Classroom Exercises Homework **Summative Assessment** Presentation History of Video Games Quiz Evolution of Video Games Quiz

Genres of video games Popular video games of the present The advancement of technology and its role in video games Video games as a hobby Society's opinion of video games Professional gaming and the world of Esports	until the early 70s 6. What led to the growth of the video game industry 7. The three biggest names in the industry are Nintendo, Microsoft, and Sony 8. Technology has revolutionized the video game industry 9. The video game community plays a large role in the industry 10. Video games are more complex and in depth then it has been in the past.	6. Explain when video games started to become more popular and why. 7. Explain how technology and the internet helped the video game industry grow and flourish. 8. Compare the differences and similarities of video games of the past and present. 9. Identify the various genres of video games. 10. Identify and explain the various reasons for why people play video games. 11. Explain how society's opinion of video games has changed and its impact on society. 12. Explain the impact of video games on society. 13. Describe the role the community plays in the video game world. 14. Explain how Esports and professional	games changed over the years? How has Esports helped change the way we view video games? Students will conduct independent readings on various topics such as different consoles, popular games, genres, Esports etc. From these readings, they will answer questions or write a summary on what they learned. Students will be required to create a presentation on an early video game, a game creator, company or publisher of their choice. This presentation will have students explain how their choice of topic has played a role in the evolution of the video game industry.		7 (1,2,5,6) 8 (4,5) 9 (2,5,6) 10 (3,5) 9.3.IT.1-13 9.2.12.C.1, 9.2.12.C.2, 9.2.12.C.3, 9.2.12.C.4, 9.2.12.C.5, 9.2.12.C.6, 9.2.12.C.7, 9.2.12.C.8, 9.2.12.C.9 Global awareness Environmental literacy Creativity and Innovation Critical Thinking and Problem Solving Communication Collaboration Flexibility & Adaptability Productivity & Accountability	CS.6.1.12.A.16.A-C CS.6.1.12.B.16.A CS.6.1.12.C.16.A-C CS.6.1.12.D.16.A-C CS.6.2.12.A.6.A-D	History and Evolution of Video Games Unit Test Midterm EXAM

		gaming has attracted numerous people to the industry. 15. Create a presentation on an early video game, a game creator, company or publisher of their choice.					

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here. Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			learners can access and participate in learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**

Unit #: Unit 5 **Unit Title:** Video Game Theory

Unit Description and Objectives:
In this unit, students will be studying about the theory and thought process of creating a video game. There are many things to consider when creating a game such as the genre, platform it will be played on, target audience, number of players, goal, etc. These things and more can the difference between a huge success or an embarrassing failure. Students will learn to create a detailed outline for a game before getting into the actual creation of it. This planning and theorizing stage is one of the most crucial when it comes to creating a game.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. What are important things to consider when creating a video game?	1. There are many things that need to be thoroughly thought out when creating a video game. These things include a name, the platform, player modes, goal/objective, genre, audience, game objects, sounds, controls, game flow, levels, etc. 2. Creating a video game can be a lengthy process. Some of the great games we see today takes years of dedication and development. 3. Creating and developing a game requires the ability to work with others. Many publishers are made of multiple teams and departments that work together in order to complete games.	1. What is the name of your game? 2. How do you create a name? 3. What platform will be optimal for the game? 4. How many players will the game support? 5. Will there be online multiplayer? 6. What is the goal of the game? 7. What genre is the game? 8. What type of audience does the game target? 9. What kind of objects are in the game? 10. What are the controls? 11. What do players use for controlling the game? 12. How many levels? 13. What is the story/background of the game? 14. How do we market towards the right audience? 15. What will the ESRB rating be?
1. Why is game flow important?	1. In order to have a successful video game, the game needs to flow smoothly. There needs to be nice transitions from level to level and even from room to room.	1. What is game flow? 2. What must you have in order to have good game flow? 3. What are some good examples of games that had good game flow?

	2. Having a good story and plot can help create good game flow. Poorly written stories or unexplained events can create holes in a game which disrupts the flow of a game. 3. Having good game flow helps keep the audience and players interested in the game. It makes kids want to finish the campaign, keeps them wanting more, and creates excitement for future games. 4. You can use storyboards and outlines to help plan out a game.	4. What are some good examples of games that had poor game flow? 5. What are some games that you thought had good game flow? 6. What can we use to help create a good story/background? 7. What happens when there is poor game flow? 8. How can we create smooth transitions from level to level and room to room?
1. How do publishers and developers make players feel like they are a part of the game?	1. Having a good story/plot, background, setting and atmosphere can help attract players and keep them interested in the game. This can also help the player feel like they are a part of the video game's world experiencing everything that is going on. 2. Characters can play a major role in video games. By making them relatable and personable, players become attached to them and want to see what happens to them. 3. Even sports games can do this by basing character models on real life athletes, and stadiums as well as incorporating the sounds of the crowd. 4. Story/plot and characters are based on what the intended audience is supposed to be.	1. What factors contribute to having a good story/plot? 2. What do developers use to set the tone and atmosphere of a game? 3. Where do video game designers get their ideas from? 4. How do video game designers bring the environment and characters to life? 5. How can video game designers make characters in game relatable to the players? 6. Why is it important to determine the target audience before creating a game? 7. What are some examples of games that had a good story and good characters that you or others liked? Did you feel like you were a part of these games? Was the game successful? 8. What are some examples of games that had a poor story and poorly thought out characters that you or others did not like? Did you feel like you were a part of these games? Was the game successful?

CURRICULUM UNIT PLAN

Course Title/Grade: Computer Systems and Video Game Design (#917) 9-12

Unit Number/Title: Unit 5- Video Game Theory

Conceptual Lens:

Appropriate Time Allocation (# of Days): 20 days

Primary Content Standards referenced With Cumulative Progress Indicators			
8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	Critical Content (Students Will Know:)	Skill Objectives (Students Will Be Able To:)	Instructional/Learning Activities & Interdisciplinary Connections	Instructional Resources	Technology & 21st C Skills Integration (Specify)	NJSLS w/ CPI Reference	Evaluation/ Assessment:
Game Name Platform Player Mode Goal Genre Target Audience Game Description Game Objects Sounds Controls	1. The name of the game can set the tone of the game. 2. The type of platform chosen for a game can help determine how successful it will be. The chosen platform can also limit the resources a video game designer can use. This will also help determine what kind of equipment the player will use to control the game. 3. Deciding the number of players for a game will help determine what	1. Identify all of the topics and concepts discussed of multiple video games. 2. Determine how video game designers made these decisions and why they made them. 3. Determine why it is important to have a target audience. 4. Determine how a publisher picks the target audience.	There will be multiple class discussions and lectures about the theory behind video games. These will include topics on the various platforms, player modes, goals, genres, target audiences, etc. of video games. Students will be given notes and be required to take notes during these discussions. Students are encouraged to participate, share their opinions, critique others, debate, and conduct research on their own. Students will read selected units from the Game Development Essentials, and be prepared to answer the questions at the end of the unit, and participate in class discussions.	1. White Board 2. Google Docs 3. Internet 4. Projector 5. Game Development Essentials Textbook	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 CS.5.1.12.A.1-3 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3 CS5.2.12.E.1-4 CS1.4.12.B.1 CS1.4.12.B.2 CS1.4.12.B.3	**Formative Assessment:** Class Discussions Group Discussions Summary Readings Classroom Exercises Homework **Summative Assessment** Quizzes Tests Video Game Design Outlines

Game Flow Levels Setting/Background Story/Plot Characters	kind of game the video game designers want to produce. 4. There are many goals of video games. These include: Entertainment, Social, Educational, Recruitment and Training, Health and Fitness, Consciousness and Change, Aesthetic and Creativity, Marketing and Advertising. 5. Choosing a specific genre and sticking with it is extremely important. There are numerous genres of video games today. 6. Picking the right audience can lead to a successful game. When picking the right audience, you have to consider the marketing process, demographics, and ESRB rating. 7. It is important to list the rules and objectives clearly for the player. Tutorials are a great tool for this. 8. There are many objects in a game	5. Determine how the platform and controls affect the outcome of a game. 6. Explain how video game designers create authentic environments and stories. 7. Explain how developers bring characters to life. 8. Explain the importance of an ESRB rating. 9. Explain the importance of game flow. 10. Explain the importance of tutorials and directions.	Students will complete a research assignment, poster and presentation on a video game they love or hate. Students will be expected to analyze a video game, and identify the different aspects of the game. Students will write a review on why they think their game is a success, or a failure. Compare and Contrast. Students will analyze various games and compare them with real life or other games. How are they related? Could this happen in the real world? Think, Pair, Share. Students will put themselves in the video game designers' shoes and try to determine their thought process behind the games. Why did they choose this setting? Why is the campaign so short? Why did they choose these characters? How did they decide the personality of the characters? What inspired them to create this game? Where do they get their influences from? Create an outline of a game. Pick a game of your choice, and complete the outline discussed in class on it. Be prepared to present your report/findings to the class. Practice creating an outline for your own game. Try completing the outline discussed in class using your		7 (1,2,5,6) 8 (4,5) 9 (2,5,6) 10 (3,5) 9.3.IT.1-13 9.3.IT-PRG.1-10 Global awareness Environmental literacy Creativity and Innovation Critical Thinking and Problem Solving Communication Collaboration Flexibility & Adaptability Productivity & Accountability Leadership & Responsibility		

	that can be interactive and non-interactive. 9. Game flow is an important concept for a game to be successful. 10. The number of levels, difficulty, and length of a game can be determined by the number of players, genre, goal, and target audience.		own thoughts and ideas for your own game.				

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here.	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all learners can access and participate in learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**

Unit #: Unit 6 **Unit Title:** Graphics and Audio

Unit Description and Objectives:
Graphics and audio are important aspects of creating an appealing game world. Students should know basic graphic design elements to apply towards creating sprites and backgrounds. This unit will first focus on creating levels, objects, and characters, and then introduce students to the importance of background music and sound effects to create an atmosphere. Students will be able to use programs such as MS Paint, Pixlr, and other graphic design programs. The structural and temporal, and spatial features of the game world will be discussed, along with their importance. Students will learn about audio effects such as voiceovers, sound effects, and music being used in games.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. What are the elements of design? 2. How can the elements of design work together to enhance the game world?	1. The elements of design include space, line, form, texture, and color. 2. Colors can be used to create moods and illusions. 3. Scale and proportion can be used to create emphasis or a realistic feel in the game environment.	1. What is space? 2. What effects can be created with line elements? 3. What effects can be created with form? 4. How can we create texture in a video game? 5. What considerations should be taken with color? 6. What is scale? Why should it be considered when creating objects and characters?
1. What is level design and how is it related to gameplay? 2. What is the importance of structural, temporal and spatial features of game worlds?	1. The process of creating game worlds is often focused on level design. 2. We can take a physical or “space-time” approach to discuss level design by focusing on how designers construct the architecture and visual of the physical game environment, and how the divide the basic structure of the world into different sections.	1. What forces are generally considered when creating a game? 2. What is the creation of environments, scenarios or missions? 3. What needs to be considered when designing levels? 4. What are the two main issues with game flow? 5. What incorporates the physical environment of the game? 6. What is perspective and why is it importance in level design? 7. How are reality and style achieved in a game environment?

1. Why is audio and important aspect of game development? 2. How are voiceovers, sound effects, and music used effectively in a game?	1. Game audio can range from sampled sound to in-game effects. 2. Audio is important for a games atmosphere and can set and change the mood.	1. What can be used to provide feedback and cues to a player? 2. What can be used in games for spoken dialogue and narration? 3. What can be used to tell the players how they should react to the visual images on the screen 4. What are the differences between looping and adaptive music?

CURRICULUM UNIT PLAN

Course Title/Grade: Computer Systems and Video Game Design (#917) 9-12

Unit Number/Title: Unit 6- Graphics and Audio

Conceptual Lens:

Appropriate Time Allocation (# of Days): 20 days

Primary Content Standards referenced With Cumulative Progress Indicators

8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	Critical Content (Students Will Know:)	Skill Objectives (Students Will Be Able To:)	Instructional/Learning Activities & Interdisciplinary Connections	Instructional Resources	Technology & 21st C Skills Integration (Specify)	NJSLS w/ CPI Reference	Evaluation/ Assessment:
I. Elements of Design A. Line B. Color C. Texture D. Form II. Level Design A. 3D Model Approach B. Scripting Approach C. Physical Approach III. Structural Features A. Duration B. Availability C. Relationship D. Progression IV. Temporal Features A. Authentic	1. The elements of design can help enhance the game environment. 2. A Physical approach focuses on how designers construct the architecture and visual aspects of the physical game environment. 3. Each level should have a set of objectives that	1. Identify the elements of design and how they can affect the game environment. 2. Discuss basic forces and when they are applicable in the game environment. 3. Take a preexisting game and identify when the level is over, and what objects need to be accomplished to create the level. 4. Students will be able to create a storyboard of a	1. Students will create a list of forces (in physics) and give a simple definition. Students can then use the physics vocabulary to define the different goals of what the students will try to accomplish in their games. 2. Students can use the simple elements of design to create a board game. Students will need to identify objectives, game rules, and game flow. 3. Students will participate in a group	1. Computers 2. Colored pencils 3. story boards 4. GameMaker 5. internet 6. Video game examples	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 NJSLS G.CO.4 CS.5.1.12.B.1-4 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3 CS1.1.12.B.1 CS1.1.12.B.2 CS1.3.12.B.3	**Formative Assessment:** 1. Notebooks 2. class participation **Summative Assessment** 10. Final 11. Storyboard project

B. Cariable C. Player-adjusted D. Altered V. Spatial Features A. Perspective B. Scale C. Boundaries VI. Importance of Audio VII. Types of Audio A. Voiceovers B. Sound Effects C. Music D. Looping vs. Adaptive	the player understands. 4. The player should be limited to a certain area until they have completed all objectives. 5. Boundaries for levels or rooms can be created using an array of different approaches 6. Scale and proportion need to be considered when placing objects and characters in a game environment. 7. Using audio can change the mood and tell the player what they should do next.	one or two level game, and explain what objectives would need to be accomplished before moving on. 5. Listen to different music soundtracks, and explain how the music makes them feel. 6. Students should be able to create basic sound effects that will change the mood or feel of the environment.	assignment that takes examples of pre-existing video games, and identifies the different features of the level layout.		7 (1,2,5,6) 8 (4,5) 9 (2,5,6) 10 (3,5) 9.3.AR-VIS.1-3 9.3.AR-PRF.1-8 Global awareness Environmental literacy Creativity and Innovation Critical Thinking and Problem Solving Communication Collaboration Flexibility & Adaptability Productivity & Accountability Leadership & Responsibility	CS.1.3.12.B.4 CS1.1.12.D.1 CS.1.3.12.D.3 CS.1.3.12.D.4	

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here. Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all learners can access and participate in	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**

Unit #: Unit 7 **Unit Title:** Creating a Game

Unit Description and Objectives:
This unit will focus on the students learning the GameMaker software. Students will start by doing basic tutorials that get progressively more difficult. Students will begin by creating an identified game, and then will progressively be able to be creative to apply their own concepts. By the end of this unit, students should be able to encompass all of information in the previous units to create their own, school appropriate video game.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. What can be created with GameMaker? 2. What are the restrictions with GameMaker?	1. GameMaker is intended to create 2D games. 2. GameMaker is easy to learn, and requires only a basic understanding of programming. 3. GameMaker does have a feature where the user can custom program.	1. What are the basic aspects of the GameMaker Interface? 2. What are the resources in the game? 3. What can we do in the game? What will we need to use other programs for? 4. What cannot be done with GameMaker? 5. What does the GameMaker user interface look like?
1. What are the components of the game?	1. Sprites are images that are used to create characters, objects, etc. 2. Objects are created using sprites, and have assigned events and actions that give it the properties that allow the object to function. 3. Audio effects need to be uploaded before being added to the game. 4. Rooms can be thought of as levels, and are where we compile backgrounds, objects, and audio effects.	1. What is a Sprite? 2. How does a sprite and a character differ? 3. What is an object? 4. What are the properties of an object? 5. What can we associate with or assign to objects? 6. How can we upload resources? 7. What is a room? 8. What do rooms encompass?
1. How do we compile what we know about logic to create a game?	1. An event is the cause, and the action is the associated effect. 2. Using the “Create” event gives an object the necessary qualities that should be associated when the game starts. 3. All other events should be specified when you would like the action to occur	1. What is an event? 2. What is an example of an event? 3. What is an action? 4. What is an example of an action? 5. What does “Collision” mean? What happens after a collision?

	4. Logic should be used when considering what events and actions should be associated with objects.	

CURRICULUM UNIT PLAN

Course Title/Grade: Computer Systems and Video Game Design (#917) 9-12

Unit Number/Title: Unit 7- Creating a Game

Conceptual Lens:

Appropriate Time Allocation (# of Days): 60 days

Primary Content Standards referenced With Cumulative Progress Indicators

8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	Critical Content (Students Will Know:)	Skill Objectives (Students Will Be Able To:)	Instructional/Learning Activities & Interdisciplinary Connections	Instructional Resources	Technology & 21st C Skills Integration (Specify)	NJSLS w/ CPI Reference	Evaluation/ Assessment:
I. Introduction to GameMaker A. User Interface B. Abilities C. Restrictions D. Creating a New Game II. GameMaker components A. Sprites B. Objects C. Resources D. Audio E. Rooms II. Logic Applications A. Events 1. Create 2. Collision 3. Key Press 4. Key Release 5. Timer 6. Destroy 7. Mouse	1. How to path a new GameMaker game to the correct file location. 2. What the abilities and restrictions of GameMaker is. 3. How to apply resources to the game. 4. How to create an event 5. How to associate an action with an event. 6. Applying all the resources available to create a	1. Create a new GameMaker game in the proper file location. 2. Identify the different aspects of the GameMaker user interface. 3. Create resources. 4. Apply resources to create objects, rooms and backgrounds. 5. Follow Tutorials to create pre-determined games 6. Apply knowledge from previous units to develop a game, and identify what events and actions will need to be use.	1. Students will be given a brief introduction to the GameMaker program and time to explore. 2. Given a tutorial, sprites, and resources, students will be able to create a game by following the tutorial directions. 3. Students will be given specific criteria, such as a genre, or goal, and have to create a video game that incorporates those goals. Students will be expected to brainstorm, complete a design brief, compile a storyboard, create resources and then	Computers Internet GameMaker MS Paint GameMaker Tutorial Packets Game Design Brief	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4) 7 (1,2,5,6) 8 (4,5) 9 (2,5,6)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 NJSLS F.BF.1 CS.5.1.12.A.1-3 CS.5.1.12.D.1-3	**Formative Assessment:** 1. Notebook 2. Participation 3. File checks **Summative Assessment** 1. Final Exam 2. Game level checks

8. Step 9. Draw B. Actions 1. Move 2. Jump 3. Draw 4. Score 5. Lives 6. Paths 7. Rooms	functioning game. 7. Problems will arise during the creation stage, and it is important to work through problems and test often. 8. Problem solving and reviewing previous events and actions can help eliminate problems.	7. Create unique games using given criteria. 8. Debug games and work through coding errors.	program and debug a game.		10 (3,5) 9.3.IT.1-13 9.3.IT-PRG.1-10 Creativity and Innovation Critical Thinking and Problem Solving Communication Collaboration Flexibility & Adaptability Productivity & Accountability Leadership & Responsibility		

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here. Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all learners can access and participate in	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

UNIT OVERVIEW

Course Title: **Computer Systems and Video Game Design (#917)**

Unit #: Unit 8 **Unit Title:** Careers in Computer Systems and Video Game Design

Unit Description and Objectives:
This unit has students explore some of the career paths associated with the fields of computer systems, networking, and programming. Areas such as IT specialist, networking administration, and video game will be covered. Students will research different careers and the requirements for the careers. High demand areas such as cyber security and cryptology will also be introduced. Students will have the opportunity to compete in events such as TSA's Career Comparison and other online competitions.

Essential Questions and Enduring Understandings:

Essential Questions:	**Enduring Understandings/Generalizations Students will understand that:**	**Guiding Questions**
1. What opportunities are available in Computer systems and video game design?	1. There are many occupational pathways associated with the area of design. 2. They can access employment information at the government's Occupational Outlook Handout website.	1. What are the differences between computer science and IT specialist? 2. What specializations are possible in computer science? 3. What is the job outlook for different branches of computer science? 4. What does a video game tester do? 5. What does a network administrator do? 6. What is the median income for different branches of computer science? 7. What companies do you see as being successful in 10 years? Why?
1. What are requirements for different careers?	1. Many times education is an important facet of the design career pathways 2. Some schools cost significantly more than others. 3. Mathematics is a requirement for most programming or computer related fields.	1. What are the educational requirements of programming? 2. What are the educational requirements of an IT specialist? 3. What programs are available for video game design?? 4. How does the cost of a public school compare with the cost of a private school?

		5. Are there any 2 year programs in computer related fields?

CURRICULUM UNIT PLAN

Course Title/Grade: **Computer Systems and Video Game Design (#917) 9-12**

Unit Number/Title: **Unit 8- Careers in Computer Systems and Video Game Design**

Conceptual Lens:

Appropriate Time Allocation (# of Days)**:** 5 days

Primary Content Standards referenced With Cumulative Progress Indicators

8.1.12.A3,4	8.1.12.F.12	9.2.12.C.3,6	
8.1.12.D.5	9.1.12.A.3	9.3.12FN-ACT.1-4	
8.1.12.E.1	9.1.12.A.6		

Topics/Concepts (Incl. time / # days per topic)	Critical Content (Students Will Know:)	Skill Objectives (Students Will Be Able To:)	Instructional/Learning Activities & Interdisciplinary Connections	Instructional Resources	Technology & 21st C Skills Integration (Specify)	NJSLS w/ CPI Reference	Evaluation/ Assessment:
I . Career Paths in the Field of Design a. Computer Science b. Programming c. Video Game Design d. Cyber Security Specialist e. Network Administrator f. Cryptanalyst A. Educational requirements 1. four year degree 2. two year degree 3. technical school 4. apprenticeship	1. The relationship between education and earnings potential. 2. Computer Science is a broad field encompassing many specialty areas. 3. The difference between median, starting and top incomes. 4. The job outlook for at least three	1. List three design careers. 2. Recall the job outlook for at least three design related occupations over the next ten years. 3. Distinguish between median, starting and top incomes. 4. Understand the relationship between the design field and many businesses and industries.	1. Students will find job listings and the requirements for different jobs. 2. Students research brainstorm how much income is required for independent living. 3. Students use classroom computers and an internet connection to access the federal government's Occupational Outlook Handbook. 4. Students go online to access stock quotes for selected design related industries and	Computers Internet Occupational Outlook Handout Excel TSA competitive events	NJSLS 8.1.12.A3,4 8.1.12.D.5 8.1.12.E.1 8.1.12.F.12 9.1.12.A.3 9.1.12.A.6 9.2.12.C.3,6 9.3.12FN-ACT.1-4 CRP1-12 Technology Foundation Standards for Students (NETS) 1 (1,2,3) 2 (1,2,3,4,5) 3 (1,4) 4 (2,4) 5 (3,4) 6 (4)	NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10 NJSLS N-Q.1-3 CS.5.1.12.B.1-4 CS.6.1.12.D	**Formative Assessment:** 1. Stock Portfolio **Summative Assessment** 1. Career Presentation

5. post graduate degree B. Earnings potential C. Degree cost D. Job Outlook E. Business and Industry connection	design related occupations over the next ten years. 5. The relationship between the design field and many businesses and industries. 6. Basic stock market investment techniques.	5. Follow their stock market investments.	invest $10.000 in two different companies. 5. Adults currently employed in the field of engineering give presentations about their careers, challenges, and what they do. 6. Students complete research as aligned in the TSA Career Comparison competition.		7 (1,2,5,6) 8 (4,5) 9 (2,5,6) 10 (3,5) 9.3.IT.1-13 9.3.IT-SUP.1-4 9.3.IT-NET.1-5 9.2.12.C.1, 9.2.12.C.2, 9.2.12.C.3, 9.2.12.C.4, 9.2.12.C.5, 9.2.12.C.6, 9.2.12.C.7, 9.2.12.C.8, 9.2.12.C.9 Global awareness Environmental literacy Creativity and Innovation Critical Thinking and Problem Solving Communication Collaboration Flexibility & Adaptability Productivity & Accountability Leadership & Responsibility		

Unit Modifications for Special Population Students:

Struggling Learners	Gifted and Talented Students (Challenge Activities)	English Language Learners	Learners with an IEP	Learners with a 504
• Assist students in getting organized. • Give short directions. • Use drill exercises. • Give prompt cues during student performance. • Let students with poor writing skills use a computer. • Break assignments into small segments and assign only one segment at a time. • Demonstrate skills and have students model them. • Give prompt feedback. • Use continuous assessment to mark students' daily progress. • Prepare materials at varying levels of ability.	• Provide ample opportunities for creative behavior. • Create assignments that call for original work, independent learning, critical thinking, problem solving, and experimentation. • Show appreciation for creative efforts • Respect unusual questions, ideas, and solutions. • Encourage students to test their ideas. • Provide opportunities and give credit for self-initiated learning. • Avoid overly detailed supervision and too much reliance on prescribed curricula. • Allow time for reflection. • Resist immediate and constant evaluation. • Avoid comparisons to other students.	• Use a slow, but natural rate of speech; speak clearly; use shorter sentences; repeat concepts in several ways. • When possible, use pictures, photos, and charts. • Corrections should be limited and appropriate. Do not correct grammar or usage errors in front of the class. • Give honest praise and positive feedback through your voice tones and visual articulation whenever possible. • Encourage students to use language to communicate, allowing them to use their native language to ask/answer questions when they are unable to do so in English. • Integrate students' cultural background into class discussions. • Use cooperative learning where students have opportunities to practice expressing ideas without risking language errors in front of the entire class.	Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process or product Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here. Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be	• Refer to page four in the Parent and Educator Guide to Section 504 to assist in the development of appropriate plans.

			applied to any discipline to ensure that all learners can access and participate in learning opportunities. The framework can be viewed here www.udlguidelines.cast.org	

CROSS-CONTENT STANDARDS ANALYSIS

Course Title: Computer Systems and Video Game Design (#917) **Grade:** 9-12

Unit Title:	Visual and Performing Arts	Comp. Health & Physical Ed.	English Language Arts	Mathematics	Science	Social Studies	World Languages	Technology	21st Century Life & Careers
Introduction to Computer Systems and Video Game Design			NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10	NJSLS N-Q.1-3	CS.5.3.12.C.1			9.3.IT.1-13	
Computer Systems			NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10	NJSLS N-Q.1-3 NJSLS A.CE.4	CS.5.1.12.B.1-4 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3 CS5.2.12.D.1-5 CS5.2.12.A.1-3 CS5.2.12.B.1			9.3.IT.1-13 9.3.IT-SUP.1-4 9.3.IT-NET.1-5	
Introduction to Programming			NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10	NJSLS N-Q.1-3 NJSLS A.CED.1	CS.5.1.12.B.1-4 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3		CS.7.1.MM.A.1	9.3.IT.1-13 9.3.IT-PRG.1-10	
History of Video Games	CS1.2.12.A.2		NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4	NJSLS N-Q.1-3	CS.5.1.12.A.1-3 CS.5.3.12.E.1	CS.6.1.12.D.12.C-E CS.6.1.12.A.16.A-C CS.6.1.12.B.16.A		9.3.IT.1-13	9.2.12.C.1, 9.2.12.C.2, 9.2.12.C.3, 9.2.12.C.4, 9.2.12.C.5, 9.2.12.C.6,

			NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 1.a NJSLS: Gr.11-12, WHST 1.c NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10			CS.6.1.12.C.16.A-C CS.6.1.12.D.16.A-C CS.6.2.12.A.6.A-D			9.2.12.C.7, 9.2.12.C.8, 9.2.12.C.9
Video Game Theory	CS1.4.12.B.1 CS1.4.12.B.2 CS1.4.12.B.3		NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10	NJSLS N-Q.1-3	CS.5.1.12.A.1-3 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3 CS5.2.12.E.1-4			9.3.IT.1-13 9.3.IT-PRG.1-10	
Graphics and Audio	CS1.1.12.B.1 CS1.1.12.B.2 CS1.3.12.B.3 CS.1.3.12.B.4 CS1.1.12.D.1 CS.1.3.12.D.3 CS.1.3.12.D.4		NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 1.a NJSLS: Gr.11-12, WHST 1.c NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10	NJSLS N-Q.1-3 NJSLS G.CO.4	CS.5.1.12.B.1-4 CS.5.1.12.C.1-3 CS.5.1.12.D.1-3			9.3.AR-VIS.1-3 9.3.AR-PRF.1-8	
Creating a Game			NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10	NJSLS N-Q.1-3 NJSLS F.BF.1	CS.5.1.12.A.1-3 CS.5.1.12.D.1-3			9.3.IT.1-13 9.3.IT-PRG.1-10	
Careers in Computer Systems and Video Game Design			NJSLS: Gr.11-12, RST 1 NJSLS: Gr.11-12, RST 3 NJSLS: Gr.11-12, RST 4 NJSLS: Gr.11-12, RST 8 NJSLS: Gr.11-12, RST 10 NJSLS: Gr.11-12, WHST 6 NJSLS: Gr.11-12, WHST 10	NJSLS N-Q.1-3	CS.5.1.12.B.1-4	CS.6.1.12.D		9.3.IT.1-13	9.2.12.C.1, 9.2.12.C.2, 9.2.12.C.3, 9.2.12.C.4, 9.2.12.C.5, 9.2.12.C.6, 9.2.12.C.7, 9.2.12.C.8, 9.2.12.C.9

***All content areas may not be applicable in a particular course.**

Washington Township Public Schools
Department of Student Personnel Services

CURRICULUM MODIFICATION

The regular curriculum is modified for Special Education students enrolled in both self-contained and resource center classes.

Each special education student has in Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed to level the playing field. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:

- Variation of time: adapting the time allotted for learning, task completion, or testing
- Variation of input: adapting the way instruction is delivered
- Variation of output: adapting how a student can respond to instruction
- Variation of size: adapting the number of items the student is expected to complete
- Modifying the content, process or product

Additional resources are outlined to facilitate appropriate behavior and increase student engagement. The most frequently used modifications and accommodations can be viewed here.

Teachers are encouraged to use the Understanding by Design Learning Guidelines (UDL). These guidelines offer a set of concrete suggestions that can be applied to any discipline to ensure that all learners can access and participate in learning opportunities. The framework can be viewed here www.udlguidelines.cast.org