



**MIDLAND PARK PUBLIC SCHOOLS**  
*Midland Park, New Jersey*  
**CURRICULUM**

# **Digital Design**

**Prepared by:**  
**Danielle Vandenberghe**

***Superintendent of Schools:***  
**Marie C. Cirasella, Ed.D.**

## **Digital Design**

### **Course Description:**

Digital Design will give 8th grade students a brief view into Computer Science concepts. Computer Science is one of the fastest growing, lucrative careers that students can go into. This exploratory class will give students a glimpse into CS concepts that we offer at the high school level. Though this nine week course students will get a chance to see how coding and programming play a part in many different avenues. The design thinking process will be looked at through game design, robotics, virtual/augmented reality, and basic programming. Students will also learn about internet safety, the dangers of the internet and how their internet postings can affect their future.

### **Suggested Course Sequence:**

Unit 1: Internet Safety - about 2 weeks

Unit 2: Programming in Games - about 5 weeks

Unit 3: Coding and Technology: Making the Connection - about 2 weeks

**Prerequisite :** None

<b>Content Area: Computer Science</b>	
<b>Unit Title: Digital Design - Unit 1 - Internet Safety</b>	
<b>Grade Level: 8</b>	
<p><b>Unit Summary:</b> In this unit students will learn how to be better online citizens. They will also learn how to deal with cyberbullying and how to keep themselves safe online. How to safeguard your information will also be discussed.</p> <p><b>Interdisciplinary Connections:</b> English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Connections to real world scenarios and social awareness and acceptance.</p> <p><b>21<sup>st</sup> Century Themes and Skills:</b> Creativity and Innovation, Communication and Collaboration, Critical Thinking &amp; Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.</p> <p>CRP1. Act as a responsible and contributing citizen and employee.  CRP2. Apply appropriate academic and technical skills.  CRP4. Communicate clearly and effectively  CRP5. Consider the environmental, social and economic impacts of decisions  CRP6. Demonstrate creativity and innovation.  CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.  CRP11. Use technology to enhance productivity.</p>	
<b>Standards (Content and Technology):</b>	
<b>CPI#:</b>	<b>Statement:</b>
8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
8.1.12.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources
8.1.12.D.2	Evaluate consequences of unauthorized electronic access (e.g. hacking) and disclosure, and on dissemination of personal information.
8.1.12.D.4	Research and understand the positive and negative impact of one's digital footprinting
8.1.12.D.5	Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, social, lifelong learning, and career needs.
8.1.12.E.2	Research and evaluate the impact on society of the unethical use of digital tools and present your research to peers.
8.1.12.B.3	Analyze ethical and unethical practices around intellectual property rights as influenced by human wants and/or needs.
<p><b>Unit Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>• What is the place of digital media in our lives?</li> <li>• How can one keep their information private online?</li> <li>• How does one's intentions impact others online?</li> <li>• How should someone behave online and handle other people's behavior?</li> </ul>	<p><b>Unit Enduring Understandings:</b></p> <ul style="list-style-type: none"> <li>• Students will understand how to keep their information private and themselves safe</li> <li>• Students will understand how to conduct themselves online</li> <li>• Students will understand how to deal with others online</li> </ul>
<p><b>Unit Learning Targets/Objectives:</b>  <i>Students will...</i></p> <ul style="list-style-type: none"> <li>• Learn how digital media fits into their lives</li> <li>• Learn how to create secure passwords</li> <li>• Learn what identity theft is</li> <li>• Learn how to protect oneself from identity theft</li> <li>• Learn how to judge the intentions and impact of people's words and actions online</li> </ul>	



- Learn how to handle inappropriate online talk
- Learn how to handle and avoid digital drama
- Learn how inappropriate online behavior can lead to cyberbullying

**Formative Assessments:**

- Teacher observations
- Discussions

**Summative/Benchmark Assessment(s):**

- Quizzes
- Tests
- Projects

**Resources/Materials** (copy hyperlinks for digital resources):

- Common Sense Media - <https://www.common sense.org/education/scope-and-sequence>
- Netsmartz - <https://www.netsmartz.org/ActivityCards#middleschool>

**Modifications:**

**Special Education Students**

- Allow errors
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

**At-Risk Students**

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans
- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

**English Language Learners**

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions
- Accept participation at any level, even one word

**Gifted and Talented Students**

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Digital Life 101	<ul style="list-style-type: none"> <li>- Learn about the 24/7, social nature of digital media</li> <li>- Learn that it is important to act responsibly when carrying out relationships over digital media</li> </ul>	1 - 2 days

	<ul style="list-style-type: none"> <li>- Learn what should and should not be posted online</li> </ul>	
Strong Passwords	<ul style="list-style-type: none"> <li>- Identify the characteristics of strong passwords</li> <li>- Apply characteristics of strong passwords</li> <li>- Create secure passwords</li> <li>- Learn why not to give out ones password</li> </ul>	1 day
Scams and Schemes	<ul style="list-style-type: none"> <li>- Understand what identity theft is and why it is important to guard against it</li> <li>- Learn to recognize strategies that scam artists use to access private information</li> <li>- Learn how to guard against phishing and identity theft</li> </ul>	1 day
Cyberbullying: Be Upstanding	<ul style="list-style-type: none"> <li>- Reflect on what it means to be brave and stand up for others offline and online</li> <li>- Learn how to show empathy for those who have been cyberbullied</li> <li>- Generate multiple solutions for helping others when cyberbullying occurs.</li> <li>- Learn how rumors can become out of control online</li> </ul>	2 days
Safe Online Talk	<ul style="list-style-type: none"> <li>- Describe positive aspects of online talking and messaging</li> <li>- Identify identify situations in which flirting and chatting become inappropriate and risky</li> <li>- Understand rules for safe online messaging, and feel empowered to deal with uncomfortable situation when communicating online</li> <li>- Learn how to conduct oneself online</li> </ul>	2 days
The Reality of Digital Drama	<ul style="list-style-type: none"> <li>- Reflect on their own impressions of digital drama</li> <li>- Compare underlying messages about drama on reality TV with “real world” digital drama among young teens</li> <li>- Think critically about the gender stereotypes associated with drama</li> </ul>	2 days
Cyberbullying: Crossing the Line	<ul style="list-style-type: none"> <li>- Analyze online bullying behaviors that “cross the line”</li> <li>- Learn about the various ways that students can be cyberbullied,</li> </ul>	1 day

	including flaming, deceiving, and harassing - Adopt the point of view of teens who have been cyberbullied, and offer solutions - How actions taken online have offline consequences	

**Teacher Notes:**

**Additional Resources**

Click links below to access additional resources used to design this unit:



<b>Content Area: Computer Science</b>	
<b>Unit Title: Digital Design - Unit 2 - Programming in Games</b>	
<b>Grade Level: 8</b>	
<b>Unit Summary:</b> Students will learn the basic concepts of programming by creating games.	
<b>Interdisciplinary Connections:</b> Math: integers, decimals, and Boolean numbers, X, Y, and Z, axis, coordinate plane and other mathematical references and connections. Art: sprite creation, colors.	
<b>21<sup>st</sup> Century Themes and Skills:</b> Creativity and Innovation, Communication and Collaboration, Critical Thinking & Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.	
<ul style="list-style-type: none"> <li>CRP1. Act as a responsible and contributing citizen and employee.</li> <li>CRP2. Apply appropriate academic and technical skills.</li> <li>CRP4. Communicate clearly and effectively</li> <li>CRP5. Consider the environmental, social and economic impacts of decisions</li> <li>CRP6. Demonstrate creativity and innovation.</li> <li>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>CRP11. Use technology to enhance productivity.</li> </ul>	
<b>Standards (Content and Technology):</b>	
<b>CPI#:</b>	<b>Statement:</b>
8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
8.1.12.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources
8.1.12.B.2	Apply previous content knowledge by creating and piloting a digital learning game or tutorial
8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g. robotic functions, website designs, applications, and games)
8.2.12.E.4	Use appropriate terms in conversation (e.g. troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types, and conditional statements).
<b>Unit Essential Question(s):</b> <ul style="list-style-type: none"> <li>● What are basic programming skills?</li> <li>● How do you create a basic game through programming?</li> </ul>	<b>Unit Enduring Understandings:</b> <ul style="list-style-type: none"> <li>● Learn the basic of programming</li> <li>● Learn how to create a basic game</li> </ul>
<b>Unit Learning Targets/Objectives:</b> <i>Students will...</i> <ul style="list-style-type: none"> <li>● Learn to use sequential coding through gaming</li> <li>● Learn to use loops and conditional logic</li> <li>● Learn to use variables in programming</li> <li>● Learn what a function is and how to use them</li> <li>● Learn about algorithm design</li> <li>● Learn about debugging</li> <li>● Learn about Boolean values</li> </ul>	

**Formative Assessments:**

- Teacher observations
- Discussions

**Summative/Benchmark Assessment(s):**

- Quizzes
- Tests
- Projects

**Resources/Materials** (copy hyperlinks for digital resources):

Ozobots - <https://portal.ozobot.com/lessons/compilation/evo-deconstruction-series>

Digital Game Design from Scratch - <http://codeweek.eu/resources/docs/DGD-Scratch-Teacher-Guide-Abrdgd.pdf>

Creative Computing - <http://scratched.gse.harvard.edu/guide/files/CreativeComputing20141015.pdf>

Little Bits - [https://littlebits.com/lessons?type=lesson&sort=recent&page=1&per\\_page=12#browse](https://littlebits.com/lessons?type=lesson&sort=recent&page=1&per_page=12#browse)

**Modifications:**

**Special Education Students**

- Allow errors
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Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Discover	- Explore game assets, design tools and programming techniques	- About 5 weeks
Design	- Create game sprites and backgrounds - Learn about algorithm design	



Develop	<ul style="list-style-type: none"> <li>- Program different game mechanics through:                             <ul style="list-style-type: none"> <li>- Sequential coding</li> <li>- Loops</li> <li>- Conditional logic</li> <li>- Functions</li> <li>- Boolean values</li> </ul> </li> </ul>	
Debug	<ul style="list-style-type: none"> <li>- Fix bugs and improve the game quality</li> </ul>	
<p><b>Teacher Notes:</b></p> <p><b>Additional Resources</b>                      Click links below to access additional resources used to design this unit:</p>		

<b>Content Area: Computer Science</b>	
<b>Unit Title: Digital Design - Unit 3 - Coding and Technology: Making the Connection</b>	
<b>Grade Level: 8</b>	
<b>Unit Summary:</b> Students will get a chance to look at how different technologies work. Students will also get to interact with different technologies.	
<b>Interdisciplinary Connections:</b> Math: integers, decimals, and Boolean numbers, X, Y, and Z, axis, coordinate plane and other mathematical references and connections. Art and Robotics will also be integrated.	
<b>21<sup>st</sup> Century Themes and Skills:</b> Creativity and Innovation, Communication and Collaboration, Critical Thinking & Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.	
<ul style="list-style-type: none"> <li>CRP1. Act as a responsible and contributing citizen and employee.</li> <li>CRP2. Apply appropriate academic and technical skills.</li> <li>CRP4. Communicate clearly and effectively</li> <li>CRP5. Consider the environmental, social and economic impacts of decisions</li> <li>CRP6. Demonstrate creativity and innovation.</li> <li>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>CRP11. Use technology to enhance productivity.</li> </ul>	
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8.2.12.E.4	Use appropriate terms in conversation (e.g. troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types, and conditional statements).
<b>Unit Essential Question(s):</b> <ul style="list-style-type: none"> <li>● How do we interact with technology?</li> <li>● What are some technologies that are used in the real world on a daily basis.</li> </ul>	<b>Unit Enduring Understandings:</b> <ul style="list-style-type: none"> <li>● Students will understand how different technologies work</li> <li>● Students will understand how certain technologies are used in the real world</li> </ul>
<b>Unit Learning Targets/Objectives:</b> <i>Students will...</i> <ul style="list-style-type: none"> <li>● Look and use different technologies</li> <li>● Figure out how certain technologies work</li> <li>● Learn how certain technologies are used in the real world</li> </ul>	

**Formative Assessments:**

- Teacher observations
- Discussions

**Summative/Benchmark Assessment(s):**

- Quizzes
- Tests
- Projects

**Resources/Materials** (copy hyperlinks for digital resources):

Cubelets, Ozobots, Droids, Drones, Virtual Goggles, Finch Robots, Little Bits

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Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Technology in the Real World	<ul style="list-style-type: none"> <li>- Students will look at different technologies that are used in the real world</li> <li>- Students will research how these technologies are used</li> </ul>	4 - 5 days
Explore Different Technologies	<ul style="list-style-type: none"> <li>- Students will explore how different technologies work and how to use them</li> <li>- Students will get to experiment with different technologies</li> </ul>	4 - 5 days



<b>Teacher Notes:</b>		

**Additional Resources**

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