Digital Game Development Supplemental Program Resources

This document was prepared by:

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Supplemental Program Resources   2024

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Introduction

This document provides supplemental information for the Digital Game Development program of study. It may be updated or revised as the base program of study, or complementary programs, are updated, added, or removed. Please contact the appropriate Education Programs Professional with any questions.

The Program of Study includes the approved courses, complementary courses, alignment(s) to industry, postsecondary options, and additional information.

The Equipment List for the Digital Game Development program of study is included and, if applicable, additional items used only in the complementary course(s) are noted.

The Crosswalks and Alignments connect and support the Digital Game Development standards for the Information Technology program of study. Complementary course standards are not listed in the crosswalks and alignments.

Program of Study Information

The following program of study information sheet as well as the program structure tables for the courses are provided to be able to print separately for handouts. The information provided is based on the best available information at the time of this document and will be updated as appropriate.

Digital Game Development

The Digital Game Development program provides students with the principles of game mechanics. Areas of study include programming, story and character development, and artistic theory and concepts to develop a game.

Information Technology Career Cluster

Information Technology® is focused on building linkages in information technology occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia, and systems integration services.

Postsecondary Options

Certificate/License
- Certificate of Achievement in Graphic Communications (TMCC)

Associate Degree
- Graphic Communications AS (TMCC)
- (CSN)
- Graphic Arts and Media Technology (MCC)

Bachelor's Degree
- Computer Science with minor in Digital Interactive Games (UNR)

Master's/Doctoral Degree
- Computer Science MA exam track – Graphics and Augmented Reality (UNLV)

For additional information on this cluster, please contact:
cteinfo@doe.nv.gov

Website: https://doe.nv.gov/offices/craleo/cte

Required Courses

Digital Game Development I

Digital Game Development II

Digital Game Development II Lab

Complementary Courses

Digital Game Development Advanced Studies

3D Animation for Digital Game Development

Software and App Development for Digital Game Development

CTE Work Experience – Information Technology

Industry-Recognized Credential – Digital Game Development

Work-Based Learning Opportunities

Job Shadowing / Internship / CTE Work Experience/ School-based Enterprise/ Apprenticeship Ready Programs

Career and Technical Student Organization

SkillsUSA   SkillsUSA NEVADA   TSA   TSA TECHNOLOGY STUDENT ASSOCIATION

State Recognized Industry Certifications

Refer to the Governor's Office of Workforce Innovation's

Nevada Industry Recognized Credential List

Aligned to Industry			
Occupation	Median Wage Per year	Annual Openings	% Growth
Special Effects Artist and Animators	$78,790	6,700	5%
Web Developers and Digital Designers	$78,300	21,800	23%
Software Developers, Quality Assurance Analysts, and Testers	$109,020	162,900	25%
Computer Programmers	$93,000	9,600	-10%
Industrial Designers	$77,030	2,700	3%
Graphic Designers	$50,10	24,800	3%

Source U.S. Bureau of Labor Statistics 2022

Program Structure for Digital Game Development

The core course sequencing is provided in the following table. Complementary Courses are available and provided later in this document. The following courses provide a completed program of study. The Lab is a complementary course available concurrently with the Digital Game Development II course.

Core Course Sequence (R) with Lab Course(s) (C)

Required/ Complementary	Course Title	Abbreviated Name	CIP Code	SCED Subject Area	SCED Course Identifier	SCED Course Level	SCED Unit Credit	SCED Course Sequence	SCED Course Number
R	Digital Game Development I	DIG GAME DEV I	50.0411	10	205	G	1.00	12	10205G1.0012
R	Digital Game Development II	DIG GAME DEV II	50.0411	10	205	G	1.00	22	10205G1.0022
C	Digital Game Development II LAB	DIG GAME DEV II L	50.0411	10	205	E	1.00	22	10205E1.0022

The complementary courses are provided in the following table. **The qualifying program of study must be completed prior to enrolling in the complementary course(s)**. A program does not have to utilize the complementary courses for students to complete their program of study.

Required/ Complementary	Course Title	Abbreviated Name	CIP Code	SCED Subject Area	SCED Course Identifier	SCED Course Level	SCED Unit Credit	SCED Course Sequence	SCED Course Number
C	Digital Game Development Advanced Studies	DIG GAME DEV AS	50.0411	10	205	E	1.00	11	10205E1.0011
C	3D Animation for Digital Game Development	3D ANIMATE DGD	50.0102	10	205	E	1.00	11	10205E1.0011
C	Software and App Development for Digital Game Development	APP DEV DGD	11.0205	10	160	E	1.00	11	10160E1.0011
C	Industry Recognized Credential – Digital Game Development	IRC DIG GAME DEV	50.0411	10	999	E	1.00	11	10999E1.0011
C	CTE Work Experience – Information Technology	WORK EXPER IT	99.0011	10	298	G	1.00	11	10298G1.0011

CIP Code – Classification of Instructional Programs (CIP) Codes

SCED – School Courses for the Exchange of Data that populates the State Infinite Campus System and the System for Accountability Information in Nevada (SAIN)

Course Descriptions

Digital Game Development I

Prerequisite: None

This course is designed to introduce students to the elements and structure of game programming and design. The areas of major emphasis in the course are game methodology, programming, game genres, game theory, 2D and 3D interactive experiences, and immersive environments. Students will apply both creative and technical skills to design and refine in addition to implementing the adventure. The appropriate use of technology is an integral part of this course.

Digital Game Development II

Prerequisite: Digital Game Development I

This course is a continuation of Digital Game Development I. This course provides intermediate digital game development students with instruction in advanced techniques and processes. The major areas of emphasis in the course will be development of characters, immersive environments, different genres, and exploration of multi-player games. Students will apply both creative and technical skills to design and refine in addition to implementing the adventure. The appropriate use of technology and industry-standard equipment is an integral part of this course.

Digital Game Development II LAB

Prerequisite: Concurrent enrollment in Digital Game Development II

This course is designed to expand the students' opportunities for applied learning. This course provides an in-depth lab experience that applies the processes, concepts, and principles as described in the classroom instruction. The coursework will encourage students to explore and develop advanced skills in their program area. The appropriate use of technology and industry-standard equipment is an integral part of this course.

Digital Game Development Advanced Studies

Prerequisite: Completion of Digital Game Development Program of Study

This course is offered to students who have completed all content standards in the Digital Game Development program of study and desire to pursue advanced study through investigation and in-depth research. Students are expected to work independently or in a team and consult with their supervising teacher for guidance. The supervising teacher will give directions, monitor, and evaluate the students' topic of study. Coursework may include various work-based learning experiences such as internships and job shadowing, involvement in a school-based enterprise, completion of a capstone project, and/or portfolio development. This course may be repeated for additional instruction and credit.

3D Animation for Digital Game Development

Prerequisite: Completion of Digital Game Development Program of Study

This course is offered to students who have completed all content standards in the Digital Game Development program and desire to pursue advanced study through investigation and in-depth research. This course introduces students to 3D animation, from preproduction, production, to postproduction. The design process will be applied to create 3D animation.

Software and App Development for Digital Game Development

Prerequisite: Completion of Digital Game Development Program of Study

This course is offered to students who have completed all content standards in the Digital Game Development program and desire to pursue advanced study through investigation and in-depth research. This course expands the learner's knowledge of algorithms. It explores Dev Net and API frameworks that are integral to application and software development.

Industry-Recognized Credential – Digital Game Development

Prerequisite: Completion of Digital Game Development Program of Study

This course is offered to students who have completed all content standards in the Digital Game Development program of study and desire to pursue an Industry-Recognized Credential that aligns with the standards and skills associated with the Digital Game Development Program of Study. This course is designed to expand the students' opportunities to pursue certification aligned with employment standards in the industry aligned with this program of study. The supervising teacher will provide instruction aligned with the certification requirements, monitor progress toward certification, and provide the students with appropriate testing or certification opportunities associated with the intended Industry-Recognized Credential that is the subject of the course. This course may be repeated for additional instruction and credit.

CTE Work Experience – Information Technology

Prerequisite: Completion of Level 2 course in the qualifying program of study

This course is designed to expand the students' opportunities for applied learning. This course provides an in-depth CTE work experience that applies the processes, concepts, and principles as described in the classroom instruction. This course will encourage students to explore and develop advanced skills through work-based learning directly related to the program of study. The course must follow NAC 389.562, 389.564, 389.566 regulations.

Equipment List

This recommended list is based upon a classroom size of 25 students. All costs are estimated and may be adjusted once verified and justified by districts with current quotes. No specific equipment vendor or brand names are endorsed due to various possibilities, but school districts should consult with stakeholders to ensure industry-recognized equipment and software are purchased. The intent of this list is to provide school districts with guidance on the equipment needed to implement the state standards for a Digital Game Development program.

CTE Classroom Equipment   **Total:**   **$5,300**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
2	Storage Cabinets (36" x 12" x 72") (lockable)	$400	$800
1	Presentation Equipment (e.g. interactive whiteboard (IWB), or other interactive display system with software and accessories	$3,500	$3,500
1	Networkable Laser Printer (black/white or color)	$1,000	$1,000

Program Equipment   **Total:**   **$44,000**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Student Computers	$1,000	$25,000
1	Teacher Computer (enhanced memory/storage, download capable)	$2,500	$2,500
1	Technology Storage/Charging System	$2,000	$2,000
2	Rendering Stations (enhanced graphics/memory/speed)	$3,000	$3,000
10	Tablets (enhanced memory/speed)	$500	$5,000
1	3-D printer	$3,000	$3,000
1	Large Graphic Display (high resolution TV/monitor)	$2,000	$2,000
1	High Resolution Printer	$1,500	$1,500

Instructional Materials   **Total:**   **$5,500**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Student Textbooks Approved CTE Instructional Materials list can be found here.	$100	$2,500
1	Teacher Textbook Edition and Resources	$500	$500
1	Digital Editing and Enhancing Software (500 license)	$2,500	$2,500

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Instructional Supplies   **Total:**   **$13,200**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Digital Drawing Tablets w/pen	$400	$10,000
3	External High-capacity Storage Drives (1 TB)	$200	$600
Varies	Computer Accessories (cases, covers, etc.) (optional)	$600	$600
Varies	Assorted Supplies (ink/toner cartridges, filament, etc.)	$2,000	$2,000

Category Totals:

Classroom Equipment	$5,300
Program Equipment	$44,000
Instructional Materials	$5,500
Instructional Supplies	$13,200
Estimated Program Total	**$68,000**

Crosswalks and Alignments for Program of Study Standards

Crosswalks and alignments are intended to assist the teacher make connections for students between the technical skills within the program and academic standards. The crosswalks and alignments are not intended to teach the academic standards but to assist students in making meaningful connections between their CTE program of study and academic courses. The crosswalks are for the required program of study courses, not the complementary courses.

Crosswalks (Academic Standards)

The crosswalks of the Digital Game Development Standards show connections with the Nevada Academic Content Standards. The crosswalk identifies the performance indicators in which the learning objectives in the Digital Game Development program connect with and support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in English Language Arts, Mathematics, and Science.

Alignments (Mathematical Practices)

In addition to connections with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the Digital Game Development Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Digital Game Development program connect with and support academic learning.

Alignments (Science and Engineering Practices)

In addition to connections with the Nevada Academic Content Standards for Science, many performance indicators support the Science and Engineering Practices. The following table illustrates the alignment of the Digital Game Development Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the Digital Game Development program connect with and support academic learning.

Crosswalks (Common Career Technical Core)

The crosswalks of the Digital Game Development Standards show connections with the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Digital Game Development program connect with and support the Common Career Technical Core. The Common Career Technical Core defines what students should know and be able to do after completing instruction in a program of study. The Digital Game Development Standards are crosswalked to the Information Technology Career Cluster™ and the Programming and Software Development Career Pathway.

Crosswalk of Digital Game Development Program of Study Standards and the Nevada Academic Content Standards

English Language Arts: Language Standards

Nevada Academic Content Standards		Performance Indicators
L.11-12.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	1.5.2

English Language Arts: Reading Standards for Informational Text

Nevada Academic Content Standards		Performance Indicators
RI.11-12.3	Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.	2.1.2; 3.2.1; 8.3.3

English Language Arts: Reading Standards for Literacy in Science and Technical Subjects

Nevada Academic Content Standards		Performance Indicators
RST.11-12.2	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	8.2.1
RST.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.	3.2.6; 8.3.2
RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.	2.1.3, 2.1.4, 2.2.2, 2.2.3 2.2.4, 2.2.5; 3.4.2; 4.2.4 4.3.8; 6.1.2, 6.1.3, 6.3.1 6.4.6; 7.1.1
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.	3.2.2; 4.1.1; 6.1.2, 6.1.3 7.1.2; 8.1.1, 8.1.3, 8.3.2 8.3.3
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.	2.1.1, 2.1.5; 3.1.1, 3.1.4 3.1.5, 3.2.1, 3.2.2, 3.2.7 3.3.1, 3.4.1; 4.1.2, 4.1.3 4.1.4, 4.1.6, 4.2.2, 4.2.4 4.3.1, 4.3.7; 5.1.1, 5.2.8 6.4.4, 6.4.6, 6.4.7, 6.5.4 6.6.8; 7.1.2, 7.1.5, 7.2.1 7.2.2; 8.1.1, 8.1.2, 8.1.3 8.2.1, 8.2.2, 8.3.2

English Language Arts: Speaking and Listening Standards

Nevada Academic Content Standards		Performance Indicators
SL.11-12.1a	Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.	1.1.1, 1.1.2, 1.2.1, 1.2.4 1.4.2, 1.5.2; 5.1.4, 5.2.8 7.3.1, 7.3.2; 8.3.1
SL.11-12.2	Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.	1.1.1, 1.1.2, 1.2.1, 1.2.4 1.4.2; 2.1.4; 8.3.1
SL.11-12.4	Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.	1.1.1, 1.1.2, 1.2.1, 1.2.4 1.4.2, 1.5.2; 3.2.1, 3.2.8 3.3.7, 3.4.3; 4.2.5
SL.11-12.5	Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.	3.2.8, 3.3.7; 4.2.5; 7.3.1 7.3.2

English Language Arts: Writing Standards

Nevada Academic Content Standards		Performance Indicators
W.11-12.3	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.	3.2.2
W.11-12.3a	Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.	3.2.3; 4.2.8, 4.3.2, 4.3.3, 4.3.5
W.11-12.3b	Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.	3.2.3
W.11-12.3c	Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution).	3.2.3, 3.2.5; 6.4.1
W.11-12.3e	Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.	3.2.5

| W.11-12.7 | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. | 7.1.2 |

English Language Arts: Writing Standards for Literacy in Science and Technical Subjects

Nevada Academic Content Standards		Performance Indicators
WHST.11-12.1e	Provide a concluding statement or section that follows from or supports the argument presented.	3.2.6
WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.	2.2.2, 2.2.3, 2.2.4, 2.2.5 3.1.2, 3.2.4, 3.2.8, 3.3.2 3.3.3, 3.3.4, 3.3.5, 3.3.6 6.2.2, 6.2.3
WHST.11-12.2a	Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.	4.2.8, 4.3.7
WHST.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	1.2.5, 1.4.1; 2.1.1; 3.1.1 3.2.7, 3.2.8, 3.3.2, 3.3.3 3.3.4, 3.3.5, 3.3.6; 4.1.3 4.1.4, 4.2.7, 5.1.1; 6.4.12 6.6.1; 7.1.5
WHST.11-12.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	1.4.4; 4.2.8
WHST.11-12.6	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	1.4.5
WHST.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	2.1.3, 2.2.1, 2.2.2, 2.2.3 2.2.4, 2.2.5; 4.2.1, 4.2.7 4.3.8; 6.3.1, 6.4.6; 7.1.4 7.1.5

WHST.11-12.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	1.1.2, 1.1.3, 1.4.2, 1.4.3 1.5.2; 2.1.4, 2.1.5, 2.2.6 3.1.1, 3.1.3, 3.1.4, 3.1.5 3.2.7, 3.3.1, 3.4.1; 4.1.1 4.1.2, 4.1.3, 4.1.4, 4.1.6 4.2.1, 4.2.2, 4.3.1; 5.1.4 5.2.8; 6.4.4, 6.4.7, 6.6.8 7.1.1, 7.2.1, 7.2.2; 8.1.1 8.1.2, 8.1.3, 8.2.1, 8.2.2 8.3.2, 8.3.3
WHST.11-12.9	Draw evidence from informational texts to support analysis, reflection, and research.	6.3.1
WHST.11-12.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	4.2.8

Math: Algebra – Creating Equations

Nevada Academic Content Standards		Performance Indicators
ACED.A.1	Create equations and inequalities in one variable and use them to solve problems.	3.3.2
ACED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	3.3.2
ACED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.	3.3.2
ACED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	3.3.2

Math: Geometry – Modeling with Geometry

Nevada Academic Content Standards		Performance Indicators
GMG.A.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	6.1.4

Math: Statistics and Probability – Making Inferences and Justifying Conclusions

Nevada Academic Content Standards		Performance Indicators
SIC.A.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.	3.2.8; 4.4.3, 4.4.4
SIC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	3.2.8
SIC.B.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	4.4.5

Science HS: Earth and Human Activity

Nevada Academic Content Standards		Performance Indicators
HS-ESS3-6	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.	4.2.2, 4.2.4; 6.6.10

Science HS: Engineering Design

Nevada Academic Content Standards		Performance Indicators
HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	2.2.2; 3.4.2
HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	3.1.2, 3.3.4, 3.3.5; 4.2.1 4.2.5; 5.3.3, 5.3.8; 6.2.5
HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.	3.4.2; 4.4.1, 4.4.3
HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.	4.2.7, 4.4.4, 4.4.5; 5.3.1 5.3.2, 5.3.3, 5.3.8; 6.3.4

Science HS: Motion and Stability – Forces and Interactions

Nevada Academic Content Standards		Performance Indicators
HS-PS2-1	Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	6.4.3, 6.4.9
HS-PS2-3	Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.	4.3.8, 4.3.9

Science HS: Energy

Nevada Academic Content Standards		Performance Indicators
HS-PS3-2	Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).	5.3.1, 5.3.2; 6.4.3, 6.4.6 6.4.9
HS-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	4.3.8, 4.3.9

**Alignment of Digital Game Development Standards
and the Mathematical Practices**

Mathematical Practices	Digital Game Development Performance Indicators
1. Make sense of problems and persevere in solving them.	3.4.2; 4.4.1, 4.4.3, 4.4.5 5.3.1-5.3.8; 6.4.12
2. Reason abstractly and quantitatively.	3.2.5, 3.2.6, 3.2.8, 3.4.4 5.1.1-5.1.10
3. Construct viable arguments and critique the reasoning of others.	3.4.3, 3.4.4; 4.1.1, 4.1.5 4.1.7; 6.4.11
4. Model with mathematics.	4.5.10; 6.5.2, 6.6.1-6.6.4
5. Use appropriate tools strategically.	3.1.3; 5.2.1-5.2.11 6.5.1-6.5.4
6. Attend to precision.	5.2.1, 5.2.3; 6.4.1-6.4.10
7. Look for and make use of structure.	3.1.2, 3.2.4; 6.6.2-6.6.5
8. Look for and express regularity in repeated reasoning.	3.2.4, 4.2.8; 5.1.1-5.1.10 6.6.9-6.6.11

Alignment of Digital Game Development Standards
and the Science and Engineering Practices

Science and Engineering Practices	Digital Game Development Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	4.1.4, 4.2.5, 4.2.7, 4.3.9
2. Developing and using models.	4.4.1 – 4.4.5, 5.3.1 – 5.3.8 6.2.3 – 6.2.5, 6.6.2 – 6.6.4 6.6.9 – 6.6.11
3. Planning and carrying out investigations.	3.4.4; 6.3.3
4. Analyzing and interpreting data.	5.3.5, 5.3.8; 6.4.6
5. Using mathematics and computational thinking.	4.2.7; 5.1.1 – 5.1.10; 6.6.1
6. Constructing explanations (for science) and designing solutions (for engineering).	3.4.3; 6.4.2 - 6.4.3
7. Engaging in argument from evidence.	3.2.5
8. Obtaining, evaluating, and communicating information.	3.3.7; 4.4.3; 6.4.4 – 6.4.5

Crosswalks of Digital Game Development Standards
and the Common Career Technical Core

Information Technology Career Cluster	Performance Indicators
1. Demonstrate effective professional communication skills and practices that enable positive customer relationships.	3.4.3, 4.2.5
2. Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.	3.3.2, 3.3.5- 3.3.7
3. Demonstrate the use of cross-functional teams in achieving IT project goals.	2.2.1-2.2.6; 3.1.1
4. Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.	7.2.1-7.2.3
5. Explain the implications of IT on business development.	2.2.5, 2.2.6
6. Describe trends in emerging and evolving computer technologies and their influence on IT practices.	8.1.1-8.1.3, 8.2.1-8.2.2 8.3.1-8.3.3
7. Perform standard computer backup and restore procedures to protect IT information.	
8. Recognize and analyze potential IT security threats to develop and maintain security requirements.	7.2.3
9. Describe quality assurance practices and methods employed in producing and providing quality IT products and services.	
10. Describe the use of computer forensics to prevent and solve information technology crimes and security breaches.	7.2.1, 7.2.2
11. Demonstrate knowledge of the hardware components associated with information systems.	
12. Compare key functions and applications of software and determine maintenance strategies for computer systems.	

Programming and Software Development Career Pathway	Performance Indicators
1. Analyze customer software needs and requirements.	6.6.11
2. Demonstrate the use of industry standard strategies and project planning to meet customer specifications.	3.4.4, 4.1.5, 4.3.7
3. Analyze system and software requirements to ensure maximum operating efficiency.	6.1.5, 6.2.1-6.2.5
4. Demonstrate the effective use of software development tools to develop software applications.	6.1.6, 6.1.7
5. Apply an appropriate software development process to design a software application.	
6. Program a computer application using the appropriate programming language.	5.1.1-5.1.10, 5.2.1-5.2.1 5.3.1-5.3.8, 6.3.3, 6.3.4

7. Demonstrate software testing procedures to ensure quality products.	4.4.5
8. Perform quality assurance tasks as part of the software development cycle.	5.3.8
9. Perform software maintenance and customer support functions.	
10. Design, create, and maintain a database.	