



MISSISSIPPI  
DEPARTMENT OF  
EDUCATION

## 2024 Multimedia Core

Program CIP: 50.0102 — Digital Arts

Direct inquiries to:

Instructional Design Specialist  
Research and Curriculum Unit  
P.O. Drawer DX  
Mississippi State, MS 39762  
662.325.2510  
[helpdesk@rcu.msstate.edu](mailto:helpdesk@rcu.msstate.edu)

Program Supervisor  
Office of Career and Technical Education  
Mississippi Department of Education  
P.O. Box 771  
Jackson, MS 39205  
601.359.3974

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The Research and Curriculum Unit (RCU), located in Starkville, as part of Mississippi State University (MSU), was established to foster educational enhancements and innovations. In keeping with the land-grant mission of MSU, the RCU is dedicated to improving the quality of life for Mississippians. The RCU enhances the intellectual and professional development of Mississippi students and educators while applying knowledge and educational research to the lives of the people of the state. The RCU works within the contexts of curriculum development and revision, research, assessment, professional development, and industrial training.

# Table of Contents

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Acknowledgments.....	3
Standards.....	5
Preface.....	6
Mississippi Teacher Professional Resources .....	7
Executive Summary .....	8
Course Outline .....	9
Career Pathway Outlook.....	10
Professional Organizations .....	13
Using This Document .....	14
Unit 1: Introduction, Safety, and Orientation .....	15
Unit 2: Principles of Design.....	16
Unit 3: Basic Photo and Video Editing.....	17
Unit 4: Basic Camera Operations .....	18
Unit 5: Content Creation.....	19
Unit 6: Career Exploration.....	20
Student Competency Profile .....	21
Appendix A: Industry Standards.....	23
Appendix B: 21st Century Skills .....	25
Appendix C: College and Career Ready Standards .....	28
Appendix D: Common Core State Standards for Mathematics .....	37
Appendix E: International Society for Technology in Education Standards (ISTE).....	39

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# Standards

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Standards and alignment crosswalks are referenced in the appendices. Depending on the curriculum, these crosswalks should identify alignment to the standards mentioned below, as well as possible related academic topics as required in the Subject Area Testing Program in Algebra I, Biology I, English II, and U.S. History from 1877, which could be integrated into the content of the units. Mississippi's CTE multimedia core is aligned to the following standards:

## **Information Technology Cluster**

- Web & Digital Communications Career Pathway (IT-WD)

## **Arts, A/V Technology & Communications Cluster**

- Printing Technology Career Pathway (AR-PRT)
- A/V Technology & Film Career Pathway (AR-AV)
- Visual Arts Career Pathway (AR-VIS)

These standards were extensively researched and reviewed by leaders in the industry, secondary and postsecondary instructors, and university specialists. For each content standard, performance elements representing major topic areas with accompanying performance indicators were developed. Measurements of assessment of the performance elements and performance indicators were developed at the basic, intermediate, and advanced levels. A complete copy of the standards can be accessed <http://www.careertech.org/career-technical-education/cctc/>.

## **International Society for Technology in Education Standards (ISTE)**

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## **College- and Career-Readiness Standards**

College- and career-readiness standards emphasize critical thinking, teamwork, and problem-solving skills. Students will learn the skills and abilities demanded by the workforce of today and the future. Mississippi adopted Mississippi College- and Career-Readiness Standards (MCCRS) to provide a consistent, clear understanding of what students are expected to learn and so teachers and parents know what they need to do to help them. [mdek12.org/oea/college-and-career-readiness-standards](http://mdek12.org/oea/college-and-career-readiness-standards)

## **Framework for 21st Century Learning**

In defining 21st-century learning, the Partnership for 21st Century Skills has embraced key themes and skill areas that represent the essential knowledge for the 21st century: global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; environmental literacy; learning and innovation skills; information, media, and technology skills; and life and career skills. [battelleforkids.org/networks/p21/frameworks-resources](http://battelleforkids.org/networks/p21/frameworks-resources)

# Preface

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Secondary CTE programs in Mississippi face many challenges resulting from sweeping educational reforms at the national and state levels. Schools and teachers are increasingly being held accountable for providing applied learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments. This document provides information, tools, and solutions that will aid students, teachers, and schools in creating and implementing applied, interactive, and innovative lessons. Through best practices, alignment with national standards and certifications, community partnerships, and a hands-on, student-centered concept, educators will be able to truly engage students in meaningful and collaborative learning opportunities.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, *Mississippi Code of 1972*, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, Ch. 487, §14; Laws, 1991, Ch. 423, §1; Laws, 1992, Ch. 519, §4 eff. from and after July 1, 1992; Strengthening Career and Technical Education for the 21st Century Act, 2019 [Perkins V]; and Every Student Succeeds Act, 2015).

# Mississippi Teacher Professional Resources

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The following are resources for Mississippi teachers:

Curriculum, Assessment, Professional Learning

Program resources can be found at the RCU's website, [rcu.msstate.edu](http://rcu.msstate.edu).

Learning Management System: An Online Resource

Learning management system information can be found at the RCU's website, under Professional Learning.

Should you need additional instructions, contact the RCU at 662.325.2510 or [helpdesk@rcu.msstate.edu](mailto:helpdesk@rcu.msstate.edu).

# Executive Summary

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## Pathway Description

The multimedia core pathway offers a robust introduction to the multimedia production realm, equipping students with key principles of design, digital citizenship, and 21st-century skills crucial for industry success. Students engage in practical learning through photo and video editing, camera operations, and targeted content creation, culminating in the publication of their work on diverse multimedia platforms. This course lays a strong foundation for digital literacy, ethical media production, and career readiness, fostering both technical proficiency and adaptability to the ever-changing multimedia landscape.

## Grade Level and Class Size Recommendations

It is recommended that students enter this program as freshman. Exceptions to this are a district-level decision based on class size, enrollment numbers, student maturity, and CTE delivery method. This is a hands-on, lab- or shop-based course. This is a classroom-based course. Therefore, a maximum of 25 students is recommended for each class, and only one class with the teacher at a time.

## Student Prerequisites

For students to experience success in the program, the following student prerequisites are suggested:

1. C or higher in English (the previous year)
  2. C or higher in high school-level math (last course taken or the instructor can specify the level of math instruction needed)
  3. Instructor approval and Test of Adult Basic Education (TABE) reading score (eighth grade or higher)
- or**
1. TABE reading and math score (eighth grade or higher)
  2. Instructor approval
- or**
1. Instructor approval

## Assessment

The latest assessment blueprint for the curriculum can be found at [rcu.msstate.edu/curriculum](http://rcu.msstate.edu/curriculum).

## Applied Academic Credit

The latest academic credit information can be found at [mdek12.org/ese/approved-course-for-the-secondary-schools](http://mdek12.org/ese/approved-course-for-the-secondary-schools).

## Teacher Licensure

The latest teacher licensure information can be found at [mdek12.org/oel/apply-for-an-educator-license](http://mdek12.org/oel/apply-for-an-educator-license).

## Professional Learning

If you have specific questions about the content of any training sessions provided, please contact the RCU at 662.325.2510 or [helpdesk@rcu.msstate.edu](mailto:helpdesk@rcu.msstate.edu).



# Course Outline

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## Option 1—One 1-Carnegie Unit Course

This curriculum consists of one 1-credit course.

### Multimedia Core

<b>Unit</b>	<b>Title</b>	<b>Hours</b>
1	Introduction, Safety, and Orientation	10
2	Principles of Design	20
3	Basic Photo and Video Editing	30
4	Basic Camera Operations	25
5	Content Creation	30
6	Career Exploration	25
<b>Total</b>		<b>140</b>

# Career Pathway Outlook

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## Overview

The Multimedia pathway, integral to the arts, A/V technology, and communications cluster, offers applied instruction aligning with Mississippi’s community and junior college programs. It emphasizes foundational design and creativity, leveraging diverse platforms for artistic expression. This course nurtures essential 21st-century design skills and digital citizenship. Geared towards careers in broadcasting, graphic design, media, and more, it includes layout creation, product illustration, and software training in CAD and desktop publishing. This pathway prepares students for advanced courses like digital design and video production, leading to opportunities in advertising, publishing, motion picture, and design services. It also positions students well for associate degrees and higher education, catering to careers ranging from technical writing to executive roles in multimedia-related fields.

## Needs of the Future Workforce

The U.S. Bureau of Labor Statistics forecasts a steady growth in arts and design occupations from 2022 to 2032, mirroring the average across all fields. Annually, approximately 95,800 new openings are expected due to growth and turnover. As of May 2022, the average wage in these fields was \$51,150, surpassing the median for all jobs. In 2021, the majority of fine and performing arts graduates specialized in commercial art, graphic design, and fine arts. A significant 64% of these graduates found roles in related fields. Notably, in Mississippi, graphic design ranks third in employment within this cluster. Art director roles, needing a bachelor's degree, are projected to grow by 6% from 2022 to 2023, outpacing graphic designers and managers at 3%. High-earning positions like art directors, special effects artists, and animators average around \$100,000 nationally, while fashion and industrial designers earn about \$75,000, and interior and graphic designers approximately \$60,000. For detailed data on current and future multimedia core-related jobs, consult Table 1. 1.

Table 1.1: Current and Projected Occupation Report

Description	Jobs, 2014	Projected Jobs, 2024	Change (Number)	Change (Percent)	Average Hourly Earnings, 2023
Arts, Design, Entertainment, Sports, and Media Occupation	12,100	12,730	630	5.2%	\$25.44
Graphic Designers	1,160	1,190	30	2.6%	\$22.19
Audio and Video Technicians	230	280	50	21.7%	\$21.70
Actors	50	70	20	40%	\$40.12
Producers and Directors	280	290	10	3.6%	\$29.21

Source: Mississippi Department of Employment Security; [mdes.ms.gov](https://mdes.ms.gov) (2023).

## Perkins V Requirements and Academic Infusion

The multimedia core curriculum meets Perkins V requirements of introducing students to and preparing them for high-skill, high-wage occupations within an arts, a/v technology and communications field. It also offers students a program of study, including secondary, postsecondary, and institutions of higher learning courses, that will further prepare them for arts,

a/v technology and communications- related careers. Additionally, this curriculum is integrated with academic college- and career-readiness standards. Lastly, it focuses on ongoing and meaningful professional development for teachers as well as relationships with industry.

### **Transition to Postsecondary Education**

The latest articulation information for secondary to postsecondary can be found at the Mississippi Community College Board website, [mccb.edu](http://mccb.edu).

## **Best Practices**

### *Innovative Instructional Technologies*

Classrooms should be equipped with tools that will teach today’s digital learners through applicable and modern practices. The multimedia core educator’s goal should be to include teaching strategies that incorporate current technology. To make use of the latest online communication tools—wikis, blogs, podcasts, and social media platforms, for example—the classroom teacher is encouraged to use a learning management system that introduces students to education in an online environment and places more of the responsibility of learning on the student.

### *Differentiated Instruction*

Students learn in a variety of ways, and numerous factors—students’ background, emotional health, and circumstances, for example—create unique learners. By providing various teaching and assessment strategies, students with various learning preferences can have more opportunities to succeed.

### *CTE Student Organizations*

Teachers should investigate opportunities to sponsor a student organization. There are several here in Mississippi that will foster the types of learning expected from the multimedia core curriculum. SkillsUSA, TSA, MECA and FBLA are examples of student organizations. Student organizations provide participants and members with growth opportunities and competitive events. They also open the doors to the world of multimedia careers and scholarship opportunities.

### *Cooperative Learning*

Cooperative learning can help students understand topics when independent learning cannot. Therefore, you will see several opportunities in the multimedia core curriculum for group work. To function in today’s workforce, students need to be able to work collaboratively with others and solve problems without excessive conflict. The multimedia core curriculum provides opportunities for students to work together and help each other complete complex tasks. There are many field experiences within the multimedia core curriculum that will allow and encourage collaboration with professionals currently in the multimedia field.

### *Work-Based Learning*

Work-based learning is an extension of understanding competencies taught in the multimedia core classroom. This curriculum is designed in a way that necessitates active involvement by the students in the community around them and the global environment. These real-world connections and applications link all types of students to knowledge, skills, and professional dispositions. Work-based learning should encompass ongoing and increasingly more complex involvement with local companies and multimedia industry professionals. Thus, supervised collaboration and immersion into the multimedia industry around the students are keys to students’ success, knowledge, and skills development.

# Professional Organizations

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Association for Career and Technical Education (ACTE)

[acteonline.org](http://acteonline.org)

Future Business Leaders of America (FBLA)

[fbla-pbl.org](http://fbla-pbl.org)

Mississippi Association for Career and Technical Education (MSACTE)

[mississippiacte.com](http://mississippiacte.com)

Mississippi Educational Computing Association (MECA)

[ms-meca.org](http://ms-meca.org)

SkillsUSA

[skillsusa.org](http://skillsusa.org)

Technology Student Association (TSA)

[tsaweb.org](http://tsaweb.org)

# Using This Document

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## **Competencies and Suggested Objectives**

A competency represents a general concept or performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to receive instruction on all competencies. The suggested objectives represent the enabling and supporting knowledge and performances that will indicate mastery of the competency at the course level.

## **Teacher Resources**

All teachers should request to be added to the Canvas Resource Guide for their course. For questions or to be added to the guide, send a Help Desk ticket to the RCU by emailing [helpdesk@rcu.msstate.edu](mailto:helpdesk@rcu.msstate.edu).

## **Perkins V Quality Indicators and Enrichment Material**

Some of the units may include an enrichment section at the end. This material will greatly enhance the learning experiences of students. If the multimedia core program is using a national certification, work-based learning, or another measure of accountability that aligns with Perkins V as a quality indicator, this material could very well be assessed on that quality indicator. It is the responsibility of the teacher to ensure all competencies for the selected quality indicator are covered throughout the year.

# Unit 1: Introduction, Safety, and Orientation

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<b>Competencies and Suggested Objectives</b>	
1. Identify course expectations, school policies, program policies, safety procedures, and jobs related to Multimedia Core. <sup>DOK1</sup>	
a. Identify course expectations, school policies, and program policies related to Multimedia Core.	
b. Apply safety procedures in the classroom, lab, and for all equipment.	
c. Explore career opportunities related to the multimedia industry.	
2. Explore 21 <sup>st</sup> century skills in relation to the classroom environment. <sup>DOK1</sup>	
a. Identify potential influences that shape personality development, including personality traits, heredity, and environment.	
b. Develop a report on how personality traits affect teamwork and leadership skills.	
c. Develop effective leadership, decision-making, and communication skills.	
d. Create a working résumé with a portfolio and continue to update throughout the course.	
e. Describe the purpose of student organizations as it relates to personality, leadership, and teamwork development.	
3. Identify legal requirements for participation in the occupation. <sup>DOK1</sup>	
a. Describe ways to avoid legal liability problems in the occupation.	
b. Discuss digital citizenship.	

**Note:** Safety is to be taught as an ongoing part of the program. Students are required to complete a written safety test with 100% accuracy before entering the shop for lab simulations and projects. This test should be documented in each student's file.

**Note:** This unit will be ongoing throughout the year. Time allotted for this unit will be distributed over the entire year.

## Unit 2: Principles of Design

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<b>Competencies and Suggested Objectives</b>	
1. Identify and apply the principles of design. <sup>DOK1</sup>	
a. Identify the core elements of design such as line, shape, color, texture, space, and form, and demonstrate their application in multimedia content.	
b. Explain the principles of balance, contrast, emphasis, unity, and space, and use these principles to analyze and critique multimedia designs.	
2. Evaluate the influence of design principles on audience engagement and the effectiveness of multimedia content. <sup>DOK2</sup>	
a. Evaluate how design choices affect audience perception and engagement, considering factors such as cultural, age, and contextual relevance.	
b. Create design solutions for defined audiences by employing principles that cater to their preferences and expectations.	
3. Integrate design principles into multimedia projects to enhance visual communication and audience engagement. <sup>DOK2</sup>	
a. Apply principles of design cohesively to produce multimedia content that is visually appealing and coherent.	
b. Utilize industry-standard design software to create layouts, select color schemes, and integrate typography that supports the content's message.	
c. Design and organize multimedia elements in a hierarchy that naturally guides the audience through the content, emphasizing key information.	



## Unit 3: Basic Photo and Video Editing

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<b>Competencies and Suggested Objectives</b>
1. Define basic terminology related to photo and video editing, including pre-production, production, and post-production. <sup>DOK1</sup>
2. Navigate and utilize editing software interfaces for media management and project setup. <sup>DOK1</sup> <ol style="list-style-type: none"><li>Identify and operate various components within the software interface.</li><li>Practice importing, exporting, and saving media with proficiency.</li></ol>
3. Employ artificial intelligence (AI) tools in photo and video editing to enhance creative and technical processes. <sup>DOK2</sup> <ol style="list-style-type: none"><li>Identify and explore AI-based features within photo and video editing software.</li><li>Apply AI tools for automated image and video enhancements, such as color correction, object removal, and composition analysis.</li><li>Evaluate the effectiveness of AI-enhanced edits in improving the quality and creativity of multimedia projects.</li></ol>
4. Apply photo editing techniques to enhance visual elements. <sup>DOK2</sup> <ol style="list-style-type: none"><li>Utilize photo editing tools to select and manipulate image portions for desired visual effects.</li><li>Employ cropping and scaling transformations to fit the compositional needs of the project.</li><li>Implement color correction to achieve consistency and mood, using brightness, hue, and contrast adjustments.</li></ol>
5. Implement video editing skills for storytelling and post-production enhancement. <sup>DOK2</sup> <ol style="list-style-type: none"><li>Apply crop, scale, and trim techniques to enhance the visual storytelling elements.</li><li>Perform color grading to establish a visual style and consistency across clips.</li><li>Integrate and adjust audio levels to complement the visual content and improve overall production quality.</li><li>Organize clips on the timeline to construct the project's sequence effectively.</li><li>Export the completed project to meet the required technical specifications for various distribution channels.</li></ol>

## Unit 4: Basic Camera Operations

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<b>Competencies and Suggested Objectives</b>	
1. Identify and understand the functions of various camera components. <sup>DOK1</sup>	
a. Recognize the different parts of a camera and articulate their specific roles in the operation of the camera.	
2. Distinguish between diverse camera types and their specific applications. <sup>DOK2</sup>	
a. Compare various types of cameras and determine their suitability for different photography and videography scenarios.	
3. Analyze and select lenses based on their characteristics and the requirements of the production. <sup>DOK2</sup>	
a. Practice the correct methods for mounting and dismounting camera lenses to prepare for various shooting conditions.	
b. Execute basic camera operations including handheld and tripod-based filming techniques to capture stable and clear footage.	
c. Implement appropriate procedures for the installation and storage of removable memory and batteries to ensure the longevity and readiness of the camera.	
4. Analyze and select lenses based on their characteristics and the requirements of the production. <sup>DOK2</sup>	
a. Evaluate the properties of different lenses and their impact on image quality and composition.	
b. Choose the appropriate lens for a given project, considering factors such as focal length, depth of field, and the intended visual effect.	

## Unit 5: Content Creation

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<b>Competencies and Suggested Objectives</b>
1. Identify the target audience for media content. <sup>DOK1</sup> a. Analyze and determine the demographics, interests, and preferences of the intended audience for tailored content creation.
2. Determine the content format for various multimedia platforms. <sup>DOK2</sup> a. Categorize different multimedia platforms by their primary functions and audience engagement strategies to set clear content goals.
3. Plan and develop the concept for multimedia content. <sup>DOK2</sup> a. Generate creative ideas and draft preliminary scripts as the foundational work for multimedia projects. b. Discuss and prepare for budgetary requirements to support the production process. c. Develop storyboards and construct detailed shot lists to guide the content creation phase.
4. Create and tailor projects for specific multimedia platforms. <sup>DOK3</sup> a. Design and produce platform-specific multimedia content, considering the technical and audience engagement criteria.
5. Review and edit content to enhance quality and adhere to technical standards. <sup>DOK2</sup> a. Conduct thorough proofreading to eliminate grammatical errors and refine the content for clarity and impact. b. Ensure the multimedia project is visually appealing and conforms to the prescribed technical specifications.
6. Publish and promote content on suitable platforms. <sup>DOK2</sup> a. Execute the publication of multimedia content across appropriate platforms and strategize its promotion to maximize reach and engagement.
7. Analyze and optimize content based on performance metrics and feedback. <sup>DOK3</sup> a. Critically assess multimedia projects through peer reviews and performance data to identify areas for improvement. b. Revise and enhance content based on evaluative feedback and performance analytics to ensure continual improvement and effectiveness.

## Unit 6: Career Exploration

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### Competencies and Suggested Objectives

1. Explore the nuances of digital citizenship as it pertains to ethical behavior, information credibility, and personal responsibilities in both classroom and professional environments. <sup>DOK3</sup>
  - a. Evaluate the ethical, cultural, and societal implications of using digital media in various contexts.
  - b. Demonstrate an understanding of personal and organizational responsibilities related to digital privacy and security.
  - c. Assess the credibility and relevance of information sourced from various digital platforms.
2. Cultivate media literacy skills with an emphasis on understanding diverse media formats and their impact on different audiences. <sup>DOK4</sup>
  - a. Compare and contrast the effectiveness of different media formats for specific target audiences.
  - b. Apply critical thinking skills to interpret and analyze media messages for bias and intent.
  - c. Produce media content that adheres to ethical standards and legal guidelines.
3. Enhance employability by focusing on effective digital communication and adaptability to emerging trends and technologies. <sup>DOK3</sup>
  - a. Communicate effectively using various digital tools and platforms in a professional setting.
  - b. Reflect on the impact of one's digital footprint on career opportunities and employability.
  - c. Investigate and adapt to emerging trends and technologies relevant to careers in the multimedia field.

# Student Competency Profile

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Student's Name: \_\_\_\_\_

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student, and it can serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

<b>Unit 1: Introduction, Safety, and Orientation</b>		
	1.	Identify course expectations, school policies, program policies, safety procedures, and jobs related to Multimedia Core.
	2.	Explore 21 <sup>st</sup> century skills in relation to the classroom environment.
	3.	Identify legal requirements for participation in the occupation.
<b>Unit 2: Principles of Design</b>		
	1.	Identify and Apply the Principles of Design.
	2.	Evaluate the influence of design principles on audience engagement and the effectiveness of multimedia content.
	3.	Integrate design principles into multimedia projects to enhance visual communication and audience engagement.
<b>Unit 3: Basic Photo and Video Editing</b>		
	1.	Define basic terminology related to photo and video editing, including pre-production, production, and post-production.
	2.	Navigate and utilize editing software interfaces for media management and project setup.
	3.	Employ artificial intelligence (AI) tools in photo and video editing to enhance creative and technical processes.
	4.	Apply photo editing techniques to enhance visual elements.
	5.	Implement video editing skills for storytelling and post-production enhancement.
<b>Unit 4: Basic Camera Operations</b>		
	1.	Identify and understand the functions of various camera components.
	2.	Distinguish between diverse camera types and their specific applications.
	3.	Analyze and select lenses based on their characteristics and the requirements of the production.
	4.	Analyze and select lenses based on their characteristics and the requirements of the production.
<b>Unit 5: Content Creation</b>		
	1.	Identify the target audience for media content.
	2.	Determine the content format for various multimedia platforms.

	3.	Plan and develop the concept for multimedia content.
	4.	Create and tailor projects for specific multimedia platforms.
	5.	Review and edit content to enhance quality and adhere to technical standards.
	6.	Publish and promote content on suitable platforms.
	7.	Analyze and optimize content based on performance metrics and feedback.
<b>Unit 6: Career Exploration</b>		
	1.	Explore the nuances of digital citizenship as it pertains to ethical behavior, information credibility, and personal responsibilities in both classroom and professional environments.
	2.	Cultivate media literacy skills with an emphasis on understanding diverse media formats and their impact on different audiences.
	3.	Enhance employability by focusing on effective digital communication and adaptability to emerging trends and technologies.

## Appendix A: Industry Standards

	Units	1	2	3	4	5	6
<b>Standards</b>							
WDC1		X	X	X	X	X	X
WDC2		X	X	X	X	X	X
WDC3		X	X	X	X	X	X
WDC4		X	X	X	X	X	X
WDC5		X	X	X	X	X	X
WDC6		X	X	X	X	X	X
WDC7		X	X	X	X	X	X
WDC8		X	X	X	X	X	X
WDC9		X	X	X	X	X	X
WDC10		X	X	X	X	X	X
PRT1		X	X	X	X	X	X
PRT2		X	X	X	X	X	X
PRT3		X	X	X	X	X	X
AVT1		X	X	X	X	X	X
AVT2		X	X	X	X	X	X
AVT3		X	X	X	X	X	X
AVT4		X	X	X	X	X	X
VIS1		X	X	X	X	X	X
VIS2		X	X	X	X	X	X

### Information Technology Career Cluster™ (IT)

#### **WDC Web & Digital Communications Career Pathway**

1. Analyze customer requirements to design and develop a Web or digital communication product.
2. Apply the design and development process to produce user-focused Web and digital communications solutions.
3. Write product specifications that define the scope of work aligned to customer requirements.
4. Demonstrate the effective use of tools for digital communication production, development, and project management.
5. Develop, administer, and maintain Web applications.
6. Design, create and publish a digital communication product based on customer needs.
7. Evaluate the functionality of a digital communication product using industry accepted techniques and metrics.
8. Implement quality assurance processes to deliver quality digital communication products and services.
9. Perform maintenance and customer support functions for digital communication products.
10. Comply with intellectual property laws, copyright laws and ethical practices when creating Web/digital communications.

### Arts, A/V Technology & Communications Career Cluster™ (AR)

**PRT Printing Technology Career Pathway**

1. Manage the printing process, including customer service and sales, scheduling, production, and quality control.
2. Demonstrate the production of various print, multimedia, or digital media products.
3. Perform finishing and distribution operations related to the printing process.

**AV A/V Technology & Film Career Pathway**

1. Describe the history, terminology, occupations and value of audio, video, and film technology.
2. Demonstrate the use of basic tools and equipment used in audio, video, and film production.
3. Demonstrate technical support skills for audio, video and/or film productions.
4. Design an audio, video and/or film production.

**VIS Visual Arts Career Pathway**

1. Describe the history and evolution of the visual arts and its role in and impact on society.
2. Analyze how the application of visual arts elements and principles of design communicate and express ideas.
3. Analyze and create two and three-dimensional visual art forms using various media.



## Appendix B: 21st Century Skills

	Units	1	2	3	4	5	6
Standards							
CS1		X	X	X	X	X	X
CS2		X	X	X	X	X	X
CS3		X	X	X	X	X	X
CS4		X	X	X	X	X	X
CS5		X	X	X	X	X	X
CS6		X	X	X	X	X	X
CS7		X	X	X	X	X	X
CS8		X	X	X	X	X	X
CS9		X	X	X	X	X	X
CS10		X	X	X	X	X	X
CS11		X	X	X	X	X	X
CS12		X	X	X	X	X	X
CS13		X	X	X	X	X	X
CS14		X	X	X	X	X	X
CS15		X	X	X	X	X	X
CS16		X	X	X	X	X	X

### CSS1-21st Century Themes

#### CS1 Global Awareness

- Using 21st century skills to understand and address global issues.
- Learning from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts
- Understanding other nations and cultures, including the use of non-English languages

#### CS2 Financial, Economic, Business, and Entrepreneurial Literacy

- Knowing how to make appropriate personal economic choices.
- Understanding the role of the economy in society
- Using entrepreneurial skills to enhance workplace productivity and career options.

#### CS3 Civic Literacy

- Participating effectively in civic life through knowing how to stay informed and understanding governmental processes.
- Exercising the rights and obligations of citizenship at local, state, national, and global levels
- Understanding the local and global implications of civic decisions

#### CS4 Health Literacy

- Obtaining, interpreting, and understanding basic health information and services and using such information and services in ways that enhance health.
- Understanding preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance, and stress reduction
- Using available information to make appropriate health-related decisions.
- Establishing and monitoring personal and family health goals
- Understanding national and international public health and safety issues.

#### CS5 Environmental Literacy

- Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water, and ecosystems.

2. Demonstrate knowledge and understanding of society’s impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.).
3. Investigate and analyze environmental issues and make accurate conclusions about effective solutions.
4. Take individual and collective action toward addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).

CSS2-Learning and Innovation Skills

**CS6 Creativity and Innovation**

1. Think creatively
2. Work creatively with others
3. Implement innovations

**CS7 Critical Thinking and Problem Solving**

1. Reason effectively
2. Use systems thinking
3. Make judgments and decisions
4. Solve problems

**CS8 Communication and Collaboration**

1. Communicate clearly
2. Collaborate with others

CSS3-Information, Media, and Technology Skills

**CS9 Information Literacy**

1. Access and evaluate information
2. Use and manage information

**CS10 Media Literacy**

1. Analyze media
2. Create media products

**CS11 ICT Literacy**

1. Apply technology effectively

CSS4-Life and Career Skills

**CS12 Flexibility and Adaptability**

1. Adapt to change
2. Be flexible

**CS13 Initiative and Self-Direction**

1. Manage goals and time
2. Work independently
3. Be self-directed learners

**CS14 Social and Cross-Cultural Skills**

1. Interact effectively with others
2. Work effectively in diverse teams

**CS15 Productivity and Accountability**

1. Manage projects

2. Produce results
- CS16 Leadership and Responsibility**
1. Guide and lead others
  2. Be responsible to others

# Appendix C: College and Career Ready Standards

	Units	1	2	3	4	5	6
<b>Standards</b>							
RI.11.1.		X	X	X	X	X	X
RI.11.2.		X	X	X	X	X	X
RI.11.3.		X	X	X	X	X	X
RI.11.4.		X	X	X	X	X	X
RI.11.5.		X	X	X	X	X	X
RI.11.6.		X	X	X	X	X	X
RI.11.7.		X	X	X	X	X	X
RI.11.8.		X	X	X	X	X	X
RI.11.9.							
RI.11.10.		X	X	X	X	X	X
W.11.1.		X	X	X	X	X	X
W.11.2.		X	X	X	X	X	X
W.11.3.		X	X	X	X	X	X
W.11.4.		X	X	X	X	X	X
W.11.5.		X	X	X	X	X	X
W.11.6.		X	X	X	X	X	X
W.11.7.		X	X	X	X	X	X
W.11.8.		X	X	X	X	X	X
W.11.9.		X	X	X	X	X	X
W.11.10.		X	X	X	X	X	X
SL.11.1.		X	X	X	X	X	X
SL.11.2.		X	X	X	X	X	X
SL.11.3.		X	X	X	X	X	X
SL.11.4.		X	X	X	X	X	X
SL.11.5.		X	X	X	X	X	X
SL.11.6.							
L.11.1.		X	X	X	X	X	X
L.11.2.		X	X	X	X	X	X
L.11.3.							
L.11.4.		X	X	X	X	X	X
L.11.5.		X	X	X	X	X	X
L.11.6.		X	X	X	X	X	X
RST.11.1.		X	X	X	X	X	X
RST.11.2.		X	X	X	X	X	X
RST.11.3.		X	X	X	X	X	X
RST.11.4.		X	X	X	X	X	X
RST.11.5.		X	X	X	X	X	X
RST.11.6.		X	X	X	X	X	X
RST.11.7.		X	X	X	X	X	X
RST.11.8.							
RST.11.9.		X	X	X	X	X	X
RST.11.10.							
WHST.11.1.							
WHST.11.2.		X	X	X	X	X	X
WHST.11.3.							
WHST.11.4.		X	X	X	X	X	X
WHST.11.5.		X	X	X	X	X	X
WHST.11.6.		X	X	X	X	X	X
WHST.11.7.		X	X	X	X	X	X
WHST.11.8.		X	X	X	X	X	X
WHST.11.9.							
WHST.11.10.							

Reading Standards for Informational Text (11-12) - College and Career Readiness Anchor

Standards for Informational Text

## RI.11 Key Ideas and Details

1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
2. Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.
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.

**RI.11 Craft and Structure**

4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
5. Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.
6. Determine an author’s point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.

**RI.11 Integration of Knowledge and Ideas**

7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.
8. Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).
9. Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln’s Second Inaugural Address) for their themes, purposes, and rhetorical features.

**RI.11 Range of Reading and Level of Text Complexity**

10. By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.

College and Career Readiness Anchor Standards for Writing

**W.11 Text Types and Purposes**

1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
  - a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create

- an organization that logically sequences claim(s), counterclaims, reasons, and evidence.
- b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience’s knowledge level, concerns, values, and possible biases.
  - c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
  - d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
  - e. Provide a concluding statement or section that follows from and supports the argument presented.
2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- a. Introduce a topic; 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.
  - b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.
  - c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.
  - d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
  - e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
  - f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.
- a. 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.
  - b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.
  - c. 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).

- d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.
- e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.

**W.11 Production and Distribution of Writing**

- 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- 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. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grades 11–12 on page 54.)
- 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.

**W.11 Research to Build and Present Knowledge**

- 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.
- 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 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.
- 9. Draw evidence from literary or informational texts to support analysis, reflection, and research.
  - a. Apply grades 11–12 Reading standards to literature (e.g., “Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics”).
  - b. Apply grades 11–12 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning [e.g., in U.S. Supreme Court Case majority opinions and dissents] and the premises, purposes, and arguments in works of public advocacy [e.g., The Federalist, presidential addresses]”).

**W.11 Range of Writing**

- 10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

College and Career Readiness Anchor Standards for Speaking and Listening  
**SL.11 Comprehension and Collaboration**

1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.
  - a. 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.
  - b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.
  - c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.
  - d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.
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.
3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.

**SL.11 Presentation of Knowledge and Ideas**

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.
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.
6. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.)

College and Career Readiness Anchor Standards for Language

**L.11 Conventions of Standard English**

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
  - a. Apply the understanding that usage is a matter of convention, can change over time, and is sometimes contested.



- b. Resolve issues of complex or contested usage, consulting references (e.g., Merriam-Webster’s Dictionary of English Usage, Garner’s Modern American Usage) as needed.
- 2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
  - a. Observe hyphenation conventions.
  - b. Spell correctly.

**L.11 Knowledge of Language**

- 3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
  - a. Vary syntax for effect, consulting references (e.g., Tufte’s Artful Sentences) for guidance as needed; apply an understanding of syntax to the study of complex texts when reading.

**L.11 Vocabulary Acquisition and Use**

- 4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies.
  - a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word’s position or function in a sentence) as a clue to the meaning of a word or phrase.
  - b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).
  - c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.
  - d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
- 5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
  - a. Interpret figures of speech (e.g., hyperbole, paradox) in context and analyze their role in the text.
  - b. Analyze nuances in the meaning of words with similar denotations.
- 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.

Reading Standards for Literacy in Science and Technical Subjects (11-12)

**RST.11 Key Ideas and Details**

- 1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

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.
3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

**RST.11 Craft and Structure**

4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

**RST.11 Integration of Knowledge and Ideas**

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.
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.
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.

**RST.11 Range of Reading and Level of Text Complexity**

10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects (11-12)

**WHST.11 Text Types and Purposes**

1. Write arguments focused on discipline-specific content.
  - a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
  - b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience’s knowledge level, concerns, values, and possible biases.
  - c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

- d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
  - e. Provide a concluding statement or section that follows from or supports the argument presented.
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
- a. 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.
  - b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.
  - c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.
  - d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
  - e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).
3. (Not applicable as a separate requirement)

**WHST.11 Production and Distribution of Writing**

- 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- 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.
- 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.

**WHST.11 Research to Build and Present Knowledge**

- 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.
- 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.

9. Draw evidence from informational texts to support analysis, reflection, and research.

**WHST.11 Range of Writing**

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.

# Appendix D: Common Core State Standards for Mathematics

	Units	1	2	3	4	5	6
<b>Standards</b>							
N-RN.1.			X	X			X
N-RN.2.			X	X			X
N-RN.3.			X	X			X
N-Q.1.			X	X	X	X	X
N-Q.2.			X	X	X	X	X
N-Q.3.			X	X	X	X	X
A-SSE.1.			X	X	X	X	X
A-SSE.2.			X	X	X	X	X
A-SSE.3.			X	X	X	X	X
A-SSE.4.			X	X	X	X	X

## Mathematics (High School) - Number and Quantity

### The Real Number System (N-RN)

1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.
3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

### Quantities (N-Q)

1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
2. Define appropriate quantities for the purpose of descriptive modeling.
3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

## Algebra

### Seeing Structure in Expressions (A-SSE)

1. Interpret expressions that represent a quantity in terms of its context.
  - a. Interpret parts of an expression, such as terms, factors, and coefficients.
  - b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret  $P(1+r)^n$  as the product of  $P$  and a factor not depending on  $P$ .
2. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
  - a. Factor a quadratic expression to reveal the zeros of the function it defines.
  - b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

- c. Use the properties of exponents to transform expressions for exponential functions.
4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.

## Appendix E: International Society for Technology in Education Standards (ISTE)

	Unit	1	2	3	4	5	6
<b>Standards</b>							
T1		X	X	X	X	X	X
T2		X	X	X	X	X	X
T3		X	X	X	X	X	X
T4		X	X	X	X	X	X
T5		X	X	X	X	X	X
T6		X	X	X	X	X	X

### International Society for Technology in Education Standards (ISTE)

#### **T1 Creativity and Innovation**

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students do the following:

- Apply existing knowledge to generate new ideas, products, or processes.
- Create original works as a means of personal or group expression.
- Use models and simulations to explore complex systems and issues.
- Identify trends and forecast possibilities.

#### **T2 Communication and Collaboration**

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students do the following:

- Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
- Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- Develop cultural understanding and global awareness by engaging with learners of other cultures.
- Contribute to project teams to produce original works or solve problems.

#### **T3 Research and Information Fluency**

Students apply digital tools to gather, evaluate, and use information. Students do the following:

- Plan strategies to guide inquiry.
- Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
- Process data and report results.

#### **T4 Critical Thinking, Problem Solving, and Decision Making**

Students use critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students do the following:

- Identify and define authentic problems and significant questions for investigation.

- b. Plan and manage activities to develop a solution or complete a project.
- c. Collect and analyze data to identify solutions and/or make informed decisions.
- d. Use multiple processes and diverse perspectives to explore alternative solutions.

**T5 Digital Citizenship**

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students do the following:

- a. Advocate and practice safe, legal, and responsible use of information and technology.
- b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
- c. Demonstrate personal responsibility for lifelong learning.
- d. Exhibit leadership for digital citizenship.

**T6 Technology Operations and Concepts**

Students demonstrate a sound understanding of technology concepts, systems, and operations. Students do the following:

- a. Understand and use technology systems.
- b. Select and use applications effectively and productively.
- c. Troubleshoot systems and applications.
- d. Transfer current knowledge to learning of new technologies.