TRUMBULL PUBLIC SCHOOLS
TRUMBULL, CONNECTICUT

Curriculum Committee of the
Trumbull Board of Education

Regular Meeting
Via Audio Conferencing*

Thursday, May 20th, 2021, 8:00 a.m.
*For Public Access to the Regular Meeting via telephone at 8:00a.m.:
Phone Numbers (US)
(US) +1 747-231-0440 PIN: 576 251 645#

AGENDA

I.   Call to Order/Introduction

II.   Correspondence / Public Comment (The public can send comments via e-mail to siwanick@trumbullps.org; comments will be summarized as Correspondence received.)

III.   Approval/Minutes – Regular Meeting 03/18/20201

IV.   New Business

    a.   Creative Writing Curriculum Guide Update

    b.   Algebra Extended Year 2 Curriculum Guide Update

    c.   Math Workshop II Curriculum Guide Update

    d.   Introduction to College Mathematics Curriculum Guide Update

    e.   Practical Applications in Mathematics Curriculum Guide Update

TRUMBULL PUBLIC SCHOOLS
TRUMBULL, CONNECTICUT

Curriculum Committee of the
Trumbull Board of Education

Regular Meeting
Live and Via Video/Audio Conferencing*

Thursday, March 18, 2021, 11:00 a.m.

MINUTES

I.   Call to Order/Introduction. The meeting was called to order by Mr. Ward at 11:05.

Members present

M.Ward, chair
L. Timpanelli
M. Petitti
S.Iwanicki, Ed.D., ex officio

Others Present:

N.Banks
J.Evans
Adeline Marzialo

II.   Correspondence / Public Comment
Dr. Iwanicki noted that the public comment was invited to send any comments via email, and that none had been received.

III. Approval/Minutes -- Regular Meeting 01/21/20201
Ms. Timpanelli moved to approve the Minutes as presented. Ms. Petitti seconded. The motion was unanimously agreed to.

IV.   New Business
   a. Report, Assistant Superintendent
      Dr. Iwanicki shared that she presented to the Board and provided an update regarding curriculum. She introduced the English Department as they were the first to update their courses during her time in Trumbull.

   b. Honors Journalism Curriculum Guide Update
      Mr. Evans outlined the ways in which the Honors Journalism has been revised to truly be a course in Media Literacy in which students can write and understand all of the journalistic modes and elements of media. Mr. Ward supported course and noted the trend towards electronic resources. Mr. Banks shared they explore a host of highly credible sources within the course. Ms. Petitti noted she was glad to see a balance in stories being explored. Ms. Timpelli made a motion to present the Honor's Journalism Curriculum Guide to the Board of Education at the next meeting. Ms. Petitti seconded. The motion was unanimously agreed to.

   c. Creative Writing Curriculum Guide Update
      Dr. Iwanicki shared that Creative Writing Curriculum Guide is also in the process of being rewritten and modernized. It is almost ready to be presented.

d. AP English Language and Composition Curriculum Guide Update
   Ms. Marzialo explained that the course has been updated by teachers trained in the College Board requirements. The teachers used the College Board architecture to fully align our Trumbull Public Schools course with the current standards and texts needed for this college credit course. Ms. Petitti made a motion to present the AP English Language and Composition Curriculum Guide to the full Board of Education. Ms. Timpanelli seconded. The motion was unanimously agreed to.

Ms. Timpanelli moved to adjourn the meeting at 11:40 and Ms. Pettiti seconded. The motion was unanimously agreed to.

TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

Creative Writing
Grade 12
2021

Last revision date: May 2003

Curriculum Writing Team

Adeline Marzialo	English Department Chair
Kristen Kravecs	Teacher

Susan C. Iwanicki, Ed.D.   **Assistant Superintendent**

Creative Writing

Grade 12
Table of Contents

The Trumbull Board of Education will continue to take Affirmative Action to ensure that no persons are discriminated against in its employment.

CORE VALUES AND BELIEFS

The Trumbull High School community engages in an environment conducive to learning which believes that all students will **read** and **write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

In the traditional English classroom students work on expository writing skills, analyzing and connecting to literature as readers. In this Creative Writing course, students work on creative writing skills, analyzing and creating nonfiction and literature, reading and observing as writers. In keeping with the English Department's overall philosophy of developing lifelong learners, a goal of this course is that students become life-long writers and lovers of the written word. Students are asked to take writing risks and reflect on their choices and accomplishments. For many this course provides the opportunity to break new ground in some way, developing their writing voices and, hopefully, the confidence to let it be heard, on paper and aloud.

This course focuses on the craft of writing and provides students with experiences in a variety of genres including creative nonfiction (engaging in such focuses as personal narrative, reviews, and reflection) and creative fiction (engaging in such focuses as children's literature, screenplay, and short story). While freewriting is an important part of the writing process, and it is built into the curriculum, because the only way to get our ideas *flowing* is to keep our pens or fingers *moving*, we will follow a set plan for learning to develop the craft and art of writing. The curriculum units are designed to be sequential, but the teacher should feel free to blend elements from different units as the needs of the class and student dictate.

Within these larger units, students will focus on different aspects of the creative process including idea generation, incorporating sensory experiences and details; style and genre criteria; sentence, tense, and point of view variation; developing authentic dialogue; characterization; setting; creating mood; and storyboarding. Students work in a writing workshop setting, creating several short pieces each week and developing larger, more substantive works for incorporation into their digital writing portfolios. What students come to understand very early in the course is that, in order to be a writer, one must write. Because of this they participate in daily habitual writing, gathering material to be used later to inspire their creativity and larger pieces. Students must come prepared to write every single day (in and out of class) and learn to take chances, make mistakes, share their writing with others, welcome critique, start from scratch, and rebuild and polish ideas, through revision and editing, to their best possible versions. In essence, they work out daily and build their writing muscles so that they can move from short exercises to longer sustained pieces, from a scene

or character sketch to a fully developed short story. First drafts are creative sparks, but true creative writing requires taking a step back to give one's ideas time to breathe before jumping back in to revise with new eyes. At the end of the course, the hope is that they will have the inclination and the stamina to sit down and craft a piece and refine it until they are satisfied with and proud of their results.

As writers are also readers and observers, students will read many short works and different creative media as mentor texts to aid in studying their craft. The course teaches students that, in order to be a writer, one must read to study the writing choices of other writers. With each genre they explore they read selections in that area. A list of suggested readings appears in the Scope and Sequence portion of the curriculum guide and highlights possible choices in each genre. The purpose of reading in the course is not to analyze the work for the sake of comprehension and literary analysis but to use the pieces as a lesson from the author on writing choices and moves, amassing a "bag of tricks," the skills and habits a writer develops and utilizes over time.

As part of a community of writers, students will share their own work aloud in small and larger groups of their peers. Together, students and teachers create a positive and constructive, open learning and sharing environment where we can all grow as writers by giving and receiving commentary and critique. Students are not permitted to keep their creativity and writing to themselves for the entire semester. Continuing to broaden their audiences, students are also encouraged to try to publish their work not only in the digital writing portfolios but to submit their work to a number of contests including PTSA Reflections, regional and national publications and contests to which they can submit their work for consideration. Their work is submitted, with their permission, to Trumbull High School's literary and arts magazine *Creative Minds*.

This course is for both the beginning and experienced creative writer, but it is strongly recommended that students have a developing passion for language and creating. To succeed, students simply need to insert and tap into their creativity, let go of their fears, trust one another, and know that we all have stories worth telling. Even the most published writers remain forever in the realm of "continuous improvement" of their work.

Major goals are for each student to develop a writing voice and creative lens. The course gives students the freedom to express themselves and practice the skills of writing. Hopefully, once discovered, their inner writers will journey with them after the semester ends.

COURSE GOALS

CCSS.ELA-LITERACY.W.11-12.2	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.
CCSS.ELA-LITERACY.W.11-12.2.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.
CCSS.ELA-LITERACY.W.11-12.2.D	Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
CCSS.ELA-LITERACY.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.
CCSS.ELA-LITERACY.W.11-12.3.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.
CCSS.ELA-LITERACY.W.11-12.3.B	Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.
CCSS.ELA-LITERACY.W.11-12.3.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).
CCSS.ELA-LITERACY.W.11-12.3.D	Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.
CCSS.ELA-LITERACY.W.11-12.3.E	Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.
CCSS.ELA-Literacy.W.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CCSS.ELA-Literacy.W.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.

CCSS.ELA-Literacy.W.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.
CCSS.ELA-Literacy.W.11-12.10	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 discipline-specific tasks, purposes, and audiences.
CCSS.ELA-Literacy.RL.11-12.3	Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).
CCSS.ELA-LITERACY.RL.11-12.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)
CCSS.ELA-LITERACY.RL.11-12.5	Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.
CCSS.ELA-LITERACY.RL.11-12.6	Analyze a case in which grasping a point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).
CCSS.ELA-LITERACY.RI.11-12.5	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.
CCSS.ELA-LITERACY.RI.11-12.6	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.
CCSS.ELA-LITERACY.L.11-12.3	Apply knowledge of language to understand how

CCSS.ELA-LITERACY.SL.11-12.1	language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
	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.
CCSS.ELA-LITERACY.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.
CCSS.ELA-LITERACY.SL.11-12.3	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.

COURSE ENDURING UNDERSTANDINGS

Students will understand that . . .

- they are writers who can come to better understand themselves and their craft through developing discipline as a writer through regular practice and participating in the writing and creative process.
- writing is a process in which they must engage from the drafting stage through publication and reflection in order to grow as writers and thinkers.
- they must, in order to produce effective written pieces for audience and purpose, reason critically.
- choosing, evaluating, reading, analyzing, and synthesizing a variety of sources, creative media, and publications as mentor texts is important to developing one's own style and writing "bag of tricks."
- by reading, modeling, and writing in many genres, one can develop a writing voice.
- a variety of organizational patterns exist for different forms of written texts, and that audience and purpose play a role in students' authorial choices.
- there are key differences between informal writing and academic writing, personal and public writing, and creative nonfiction and fiction writing.
- mistakes provide opportunities for growth.
- sharing writing with others and welcoming critique and commentary provide opportunities for growth.

COURSE ESSENTIAL QUESTIONS

- What is creativity?
- What forms can creativity take in writing?
- What is a writer's craft?
- How do writers generate their ideas and craft their pieces?
- What moves and choices can writers make to achieve their purpose and enhance meaning, and how do these moves influence writing and reading of pieces?
- What are the differences between public and private, informal and academic, and nonfiction and fiction writing?
- Why is storytelling an essential part of being human?
- How can we contribute to the greater collection of the human narrative?

COURSE KNOWLEDGE & SKILLS

Students will know . . .
- a writer's voice relates to their style and utilization of writing moves and choices.
- key terms to identify and analyze writing choices.
- writing choices/moves: syntax and sentence variation; sensory detail and figurative language (metaphor, simile, imagery, symbolism); organization, shifts, and structure; punctuation; tone and mood; form and mode; diction; motif and theme; dialogue; repetition; characterization, plot development and other literary devices and terms studied and mastered in previous years' English courses that students will now apply as writers rather than readers.
- an author's point of view and purpose in a text.
- how writers effectively use writing conventions and rhetorical techniques to communicate ideas.
- how to generate ideas from their experiences and observations, building writing inventories.
- "read like writers," choosing and evaluating sources and creative media as mentor texts.
- by reading, modeling, and writing in many genres, one can develop a writing voice.
- How to evaluate the effectiveness of an author's creative choices and how they contribute to the overall impact of text.
- audience awareness and purpose when making writing choices such as structure, point of view, tone, and conventions is important.
- the key differences between informal writing and academic writing, personal and public writing, and creative nonfiction and fiction writing.
- different modes of writing are tailored to different audiences and purposes.
- mistakes provide opportunities for growth.
- sharing writing with others and welcoming critique and commentary provide opportunities for growth.

Students will be able to . . .
- follow the steps of the writing process: drafting, revising, editing, publishing.
- appropriately organize their ideas when writing and speaking for genre, audience, purpose, meaning and/or task.
- read texts closely to gain a deeper understanding of the ideas contained within the art of masterful writing.
- identify modes of creative writing based on their distinct qualities.
- analyze pieces of creative writing based on their structure, craft, and target audience.
- utilize creative writing to further their understanding of themselves and the world.
- participate meaningfully in discussions to display and/or enhance insight into a text or idea.
- collaborate with others and extend collaboration via technology to gain insight, improve writing techniques, and realize their own writing style and voice in comparison to others.
- generate ideas using techniques modeled in class such as prompts, environment, mentor texts, writing inventories.
- provide and receive critique and commentary to further improve written expression, style, voice, and skill identification, usage, and development.

COURSE SYLLABUS

Course Name
Creative Writing
Level
Advanced College Placement

Prerequisites
Successful completion of grades 9, 10, and 11 English

General Description of the Course
This course focuses on the craft of writing and provides students with experiences in a variety of genres including creative non-fiction (personal narrative, reviews, and reflection, and creative fiction), children's literature, screenplay, and short story. Within these larger units, students will focus on different aspects of the creative process, including idea generation, sensory experiences, sentence variation, developing dialogue, characterization, and storyboarding. Students work in a writer's workshop setting, creating several short pieces each week and developing larger, more substantive works for incorporation into their digital writing portfolios.

As writers are also readers, students will read many short works as mentor texts to aid in studying their craft. A part of a community of writers, they will share their own work aloud in small and larger groups of their peers. The major goal is for each student to develop a writing voice and creative lens. This course is for both the beginning and experienced creative writer, but it is strongly recommended that students have a passion and the stamina for habitual writing.

Assured Assessments
Formative Assessments:
- Idea Generation Quick-Write Writing Prompts
- Commenting on Writer's Moves with Mentor Texts
- Reading Reviews and Forming Criteria

Summative Assessments:
- o Scene Sketch
- o Nonfiction Narrative Writing
- o Reading Reviews and Formulating Criteria
- o What is a Short Story? Short Film Analysis
- o Food/Film/Music Review Writing
- o Short Story Writing

Supplemental Texts

- o Dicks, Matthew, and Dan Kennedy. *Storyworthy Engage, Teach, Persuade, and Change Your Life through the Power of Storytelling*. New World Library, 2018.
- o Kittle, Penny. *Write beside Them: Risk, Voice, and Clarity in High School Writing*. Portsmouth, NH, Heinemann, 2008.
- o Miller, Brenda, and Suzanne Paola. *Tell It Slant: Writing and Shaping Creative Nonfiction*. McGraw Hill, 2004.
- o *The New York Times*. The New York Times. Web. <http://www.nytimes.com/>. A great source for high quality nonfiction.

UNIT 1
Crash Course in Creativity:
Tapping into Your Creative Self and Seeing the World as a Writer

This shorter unit is an introduction to the course and generally formative in itself. Much of the work from this unit will both lay the foundation and become the inspiration for later writings. This initial unit is meant to be a crash course in creativity to prove to students that they can be creative and that they have unique ideas and voices that should be shared. We start the course revving our creative engines, compiling ideas that touch on a range of creative nonfiction and fictional strategies, forms, and topics. Bouncing between nonfiction and fiction before studying each genre independently of one another blurs the line between the two domains and allows for students to practice drawing on techniques from both sides in their work. Students will also begin constructing their digital writing portfolios at the start of this course so that they can add to these portfolios with each piece they produce.

Unit 1 Goals
*Bolded goals denote **primary** unit goals*

At the completion of this unit students will:

CCSS.ELA-LITERACY.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.
CCSS.ELA-LITERACY.W.11-12.3.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.
CCSS.ELA-LITERACY.W.11-12.3.B	Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.
CCSS.ELA-LITERACY.W.11-12.3.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).
CCSS.ELA-LITERACY.W.11-12.3.D	Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.
CCSS.ELA-Literacy.W.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate

CCSS.ELA-Literacy.W.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.
CCSS.ELA-Literacy.W.11-12.10	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.
CCSS.ELA-LITERACY.SL.11-12.1	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.
CCSS.ELA-LITERACY.RL.11-12.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)

(Note: the top of the page continues "to task, purpose, and audience." which belongs to the row above W.11-12.6)

Unit 1 Essential Questions

- What is creativity?
- What forms can creativity take in writing?
- Why do we write?
- How do writers create?
- How can one generate ideas?
- How does one utilize writing choices to achieve purpose and enhance meaning?
- How do point of view and sensory details impact the telling of a story?

Unit 1 Scope and Sequence

- Students will reflect on their previous writing and creative experiences throughout their educational careers.
- Students will set writing goals for the semester.
- Students will practice daily habitual writing through prompt responses and free writing opportunities.
- Students will examine how authors write using choices and moves.
- Students will develop a writing notebook or document to organize idea generating prompts and pieces.
- Students will participate in and follow the steps of the writing process: idea generating, drafting, revising, editing, publishing.
- Students will participate in collaborative writings through Google Suite.

- Students will add to their writing portfolios.

Unit 1 Assured Assessments

Formative Assessment: Idea Generation Quick-Write Writing Prompts

Students will engage in informal, habitual writing where they respond to teacher-provided prompts for 5 minutes or more in a notebook or document where they will organize their daily responses. The assignment's purpose is as a brainstorming activity to formulate and generate student ideas, scaffold learning, check for understanding, and connect students to the idea of creativity. In addition, teachers can capture information about individual and class understandings, skills, and interests to inform instruction.

Teachers will select additional formative activities based on student skills from the following examples or other creative writing activities as suggested by the NCTE or College Board:

Five-Minute Writing Prompt Response Log
Prompts
A-Z lists
First, Last, Best Worst Memory Generator
Add a Sentence Class Story
Creative Vision Boards
Writing History
Writing History Rubric
Synesthesia & Sensory Details
Point of View Notes and Samples
Thrift Store item story
Note for Random Person
Creating Digital Portfolios with Google Sites

Summative Assessment: Scene Sketch

Students will develop one of their short pieces initially inspired by a Idea Generation Quick-Write Writing Prompts into a formal, revised piece. The student must expand the initial piece into a scene that effectively utilizes writing choices discussed during the introductory unit such as point of view and/or sensory details. One of the possible formats is a song story scene where students choose a song that lends itself to narrative, brainstorm the story they imagine while listening to the song, and then produce a short descriptive story scene inspired by the song, selecting an effective point of view and crafting sensory details. The assignment will assess students' idea generation, revision skills, and writing choices. This assignment will be a part of the marking period grade.

Teachers will select summative activities based on student skills from the following examples or other creative writing activities as suggested by the NCTE or College Board:

<u>Song Scene Story</u>

Unit 1 Resources

<u>Supplemental</u>
- "<u>Homework for Life</u>" from the <u>TedxTalk by Matthew Dicks</u>
- Excerpts from *Tell it Slant* by Brenda Miller and Suzanne Paola
- Teacher selected prompts
- Student selected prompts

Unit 1 Time Allotment

- Approximately ~2-3 weeks

Unit 2 Goals
*Bolded goals denote **primary** unit goals*

At the completion of this unit students will:

CCSS.ELA-LITERACY.W.11-12.2	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.
CCSS.ELA-LITERACY.W.11-12.2.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.
CCSS.ELA-LITERACY.W.11-12.2.D	Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
CCSS.ELA-LITERACY.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.**
CCSS.ELA-LITERACY.W.11-12.3.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.
CCSS.ELA-LITERACY.W.11-12.3.B	**Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.**
CCSS.ELA-LITERACY.W.11-12.3.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).**
CCSS.ELA-LITERACY.W.11-12.3.D	Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.
CCSS.ELA-LITERACY.W.11-12.3.E	**Provide a conclusion that follows from and**

	reflects on what is experienced, observed, or resolved over the course of the narrative.
CCSS.ELA-Literacy.W.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CCSS.ELA-LITERACY.RI.11-12.5	**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.**
CCSS.ELA-LITERACY.RI.11-12.6	**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.**
CCSS.ELA-LITERACY.SL.11-12.1	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.
CCSS.ELA-LITERACY.SL.11-12.3	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.

Unit 2 Essential Questions

- What is creative nonfiction?
- What are the criteria of the nonfiction genre?
- What is the tradition of the personal narrative?
- How does one utilize writing choices to achieve purpose and enhance meaning?

Unit 2 Scope and Sequence

- Students will study creative nonfiction genres, developing genre criteria.
- Students will examine their own identities and contemplate the formation of that identity in writing.
- Students will practice daily habitual writing.
- Students will examine how authors write using choices and moves.
- Students will make writing choices and moves within their own pieces to achieve purpose and enhance meaning.

- Students will participate in peer critique and feedback sessions.
- Students will reflect on their choices and final pieces.
- Students will participate in and follow the steps of the writing process: idea generating, drafting, revising, editing, publishing.
- Students will participate in collaborative writings and peer review through Google Docs and other platforms such as Padlet and Jamboard.
- Students will participate in a variety of writing assignments ranging from short, informal responses (on-line and/or in class), to extended, formal pieces which have gone through many drafts and revisions.
- Students will add to their writing portfolios.

Unit 2 Assured Assessments

Formative Assessment: Commenting on Writer's Moves with Mentor Texts

Students will read a series of mentor texts, personal narratives and other creative nonfiction, *as writers* to identify, evaluate, and then practice the writing moves/choices the authors make to advance and tell their stories. The assignment's purpose is to expose students to writing choices and moves, the skills and habits a writer develops and utilizes over time. Students will work to amass a "bag of tricks" to aid in studying their craft. Teachers can capture information about individual and class understandings, skills, and interests to inform instruction.

Teachers will select additional formative activities based on student skills from the following examples or other creative writing activities as suggested by the NCTE or College Board:

Reading Like a Writer - Writer's Moves
Commenting on Writer's Moves
Rating Narrative Openings
Opening Line Peer Feedback Padlet
Crafting 5 Second Stories
Reading College Essays and Personal Narratives
Mentor Text Mad-Libs

Summative Assessment: Nonfiction Narrative Writing

Students will engage in a form of narrative writing (personal narrative, narrative essay, gonzo journalism, etc.) where they employ writing moves/choices to form a final piece that showcases student learning and skill development from mentor text review in their choices in form and organization; incorporating sensory experiences and details; adherence to style and genre criteria; sentence and tense variation; and development of compelling moments within the narrative that speak to the meaning and focus of the piece. The assignment will assess students' skills, use of details, and mechanics. This assignment will be a major part of the marking period grade.

Teachers will select summative activities based on student skills from the following examples or other creative writing activities as suggested by the NCTE or College Board:

College Essay and/or Personal Narrative
       a. <u>Personal Narrative</u>
       b. <u>Personal Narrative Reflection Summative Assessment</u>
       c. <u>Personal Narrative Reflective Commentary</u>
       d. <u>Self-Assessment</u>

Unit 2 Resources

<u>Supplemental</u>

- Excerpts from *Storyworthy* by Matthew Dicks
- <u>Narrative Writing from The New York Times</u>
- <u>TED Talk "The Power of Personal Narrative" by J. Christian Jensen</u>
- <u>TED Talk "Pain & Art: Write What You Honestly Know" by Ryan Gattis</u>
- <u>Humans of New York</u>
- Teacher selected personal narratives
- Student selected personal narratives

Unit 2 Time Allotment

- Approximately ~4-6 weeks

UNIT 3
Creative Nonfiction: Review Writing

Unit 3 Goals
*Bolded goals denote **primary** unit goals*

At the completion of this unit students will:

CCSS.ELA-LITERACY.W.11-12.2	**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.**
CCSS.ELA-LITERACY.W.11-12.2.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.
CCSS.ELA-LITERACY.W.11-12.2.D	Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
CCSS.ELA-LITERACY.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.**
CCSS.ELA-LITERACY.W.11-12.3.D	**Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.**
CCSS.ELA-LITERACY.W.11-12.3.E	Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.
CCSS.ELA-LITERACY.RI.11-12.5	**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.**
CCSS.ELA-LITERACY.RI.11-12.6	**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.**
CCSS.ELA-LITERACY.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.

Unit 3 Essential Questions

- What are the criterias of review writing?
- How might review criteria vary by topic (food, film, music)?
- How do writers structure their reviews?
- How does one utilize writing choices to achieve purpose, convey information, and enhance meaning?
- How can writers craft credible reviews?

Unit 3 Scope and Sequence

- Students will examine published and student sample reviews to identify and evaluate how authors write reviews using choices and moves.
- Students will make writing choices and moves within their own pieces to achieve purpose and enhance meaning.
- Students will participate in peer critique and feedback sessions.
- Students will reflect on their choices and final pieces.
- Students will participate in and follow the steps of the writing process: idea generating, drafting, revising, editing, publishing.
- Students will participate in collaborative writings and peer review through Google Docs and other platforms such as Padlet and Jamboard.
- Students will participate in a variety of writing assignments ranging from short, informal responses (on-line and/or in class), to extended, formal pieces which have gone through many drafts and revisions.
- Students will add to their writing portfolios.

Unit 3 Assured Assessments

Formative Assessment: Reading Reviews and Formulating Criteria

Students will read a series of published reviews and student sample reviews as mentor texts, *as writers* to notice the writing moves/choices the authors make to sequence, develop and convey a purpose for their reviews. Students will collaborate to develop criteria for review writing by topic and across the genre through group discussions, Padlet or Jamboard activities, or The assignment's purpose is to expose students to genre specific writing choices and moves, the skills and habits a writer develops and utilizes over time. Students will continue to add to their

"bag of tricks" as they deepen the study of their craft. Teachers can capture information about individual and class understandings, skills, and interests to inform instruction.

Teachers will select additional formative activities based on student skills from the following examples or or other creative writing activities as suggested by the NCTE or College Board:

Review Packets - Food and Film
Sensory Description Prompts
Class Padlets:
  Taste and Food Words
  Tasteless Descriptions
  Film/TV Review Criteria
  Food/Restaurant Review Criteria
  Film/TV Show Idea Pitches
  Boring or Awesomely Terrible Film/Show Descriptions

Summative Assessment: Food/Film/Music Review Writing

After a close study of published and student sample reviews and developing the criteria for review writing, students will produce a review within one of the following categories: food, film/TV, or music where they employ writing moves/choices to form a final piece that showcases student choices in form and organization, incorporating sensory experiences and details; adherence to style and genre criteria; sentence and tense variation; and the development of compelling moments within the narrative that speak to the meaning of the piece. The assignment will assess students' skills, use of details, and mechanics. This assignment will be a major part of the marking period grade.

Teachers will select summative activities based on student skills from the following examples or other creative writing activities as suggested by the NCTE or College Board:

Food or Film Review Assignment and Graphic Organizer

Unit 3 Resources

Supplemental

- *Tell it Slant* by Brenda Miller and Suzanne Paola
- TedxTalk by Matthew Dicks
- Review Packets - Food and Film
- Teacher selected reviews
- Student selected reviews

Unit 3 Time Allotment

- Approximately ~3-4 weeks

UNIT 4
Creative Fiction: The Short Story

Unit 4 Goals
*Bolded goals denote **primary** unit goals*

At the completion of this unit students will:

CCSS.ELA-LITERACY.W.11-12.2.D	Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
CCSS.ELA-LITERACY.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.
CCSS.ELA-LITERACY.W.11-12.3.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.**
CCSS.ELA-LITERACY.W.11-12.3.B	**Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.**
CCSS.ELA-LITERACY.W.11-12.3.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).
CCSS.ELA-LITERACY.W.11-12.3.D	**Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.**
CCSS.ELA-LITERACY.W.11-12.3.E	Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.
CCSS.ELA-Literacy.W.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.
CCSS.ELA-Literacy.RL.11-12.3	Analyze the impact of the author's choices regarding how to develop and relate elements of a story or

	drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).
CCSS.ELA-LITERACY.RL.11-12.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)
CCSS.ELA-LITERACY.RL.11-12.5	Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.
CCSS.ELA-LITERACY.RL.11-12.6	Analyze a case in which grasping a point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).
CCSS.ELA-LITERACY.L.11-12.3	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.
CCSS.ELA-LITERACY.SL.11-12.1	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.

Unit 4 Essential Questions

- What is creative fiction?
- What is a short story?
- What are the criteria of the short story genre?
- What are the elements of a story?
- How does one create believable dialogue?
- How does one build authentic characters?
- How does one utilize sensory details, POV, and other writing choices to achieve purpose and enhance meaning?

Unit 4 Scope and Sequence

- Students will study short pieces in the creative genre, developing genre criteria.
- Students will practice daily habitual writing.
- Students will examine how authors write using choices and moves.
- Students will make writing choices and moves within their own pieces to achieve purpose and enhance meaning.
- Students will participate in peer critique and feedback sessions.
- Students will reflect on their choices and final pieces.
- Students will participate in and follow the steps of the writing process: idea generating, drafting, revising, editing, publishing.
- Students will participate in collaborative writings and peer review through Google Docs and other platforms such as Padlet and Jamboard.
- Students will participate in a variety of writing assignments ranging from short, informal responses (on-line and/or in class), to extended, formal pieces which have gone through many drafts and revisions.
- Students will add to their writing portfolios.

Unit 4 Assured Assessments

Formative Assessment: What is a Short Story? Short Film Analysis

Students will watch a series of short films and take notes that will help them write a response that answers the prompt: "Based on the short films, what is a short story? These are film representations of short stories, so what are the criteria involved in a short story? What do these shorts have in common? Think about structure/composition, story arc, point of view, characters, setting, style, plot, time span, etc." Teachers can capture information about individual and class understandings, skills, and interests to inform instruction.

Teachers will select additional formative activities based on student skills from the following examples or or other creative writing activities as suggested by the NCTE or College Board:

Topic generations
Children's book review
Mini screenplay creation
Postcard Fiction
Dialogue Exercises: Are We Really Still Talking About the Dishes? and Tell Me How You Really Feel
Dialogue Exercise Formative Assessment
Log lines
Story ladders
Sensory Details to Build Setting and Character
Characterization and POV: Speed Date Your Main Character and Character Mad Libs

Summative Assessment: Short Story Writing

Students will produce a complete short story in the genre of their choosing, where they employ writing moves/choices related to structure and organization; incorporating sensory experiences and details; adherence to style and genre criteria; authentic dialogue creation; plot and story arc; sentence, tense, and point of view variation; characterization; time span and setting; mood development, etc. all related to the purpose of their piece. The assignment will assess students' cumulative skills and mechanics over the course. This assignment will be a major part of the marking period grade.

Teachers will select summative activities based on student skills from the following examples or other creative writing activities as suggested by the NCTE or College Board:

Visual Plot Diagramming/Storyboarding Slides (assignment is explained at the end)
Short Story
Short Story Rubric
Digital Portfolio

Unit 4 Resources

Supplemental

Animated Short Films:
- "Hair Love"
- "The Present"
- "Piper"
- "Purl"

Live Action:
- "Cautionary Tales"
- "Stutterer"
- "The Lunch Date"
- "Hot Dog"

- Pixar in a Box: Story Structure
- Learn Plot Diagram Using Disney and Pixar Movie Clips
- Plot Video 1 and Plot Video 2
- Teacher selected short stories
- Student selected short stories

Unit 4 Time Allotment

- Approximately ~6-8 weeks

One-half credit in English
One class period daily for a half year

PREREQUISITES

Twelfth grade students must have successfully completed grade 11 English. Eleventh grade students must have successfully completed grade 10 English. While students of all levels - 200, 300 and 400 - can take the course, students must have a strong interest in writing. The course is challenging in terms of the breadth and scope of the writing work and students must be willing to write all the time.

CURRENT REFERENCES

Dicks, Matthew, and Dan Kennedy. *Storyworthy Engage, Teach, Persuade, and Change Your Life through the Power of Storytelling*. New World Library, 2018.

Kittle, Penny. *Write beside Them: Risk, Voice, and Clarity in High School Writing*. Portsmouth, NH, Heinemann, 2008.

Miller, Brenda, and Suzanne Paola. *Tell It Slant: Writing and Shaping Creative Nonfiction*. McGraw Hill, 2004.

The New York Times. The New York Times. Web. <http://www.nytimes.com/>. A great source for high quality nonfiction.

ASSURED STUDENT PERFORMANCE RUBRICS

Final Exam Rubric CW - Portfolio & Author's Note

	Writer demonstrates consistent success and a complex understanding of the impact of writing choices.	Writer demonstrates consistent success in displaying a general understanding of the impact of writing choices.	Writer demonstrates inconsistent success in displaying an understanding of the impact of writing choices due to uneven utilization.	Attempts to demonstrate an understanding of the impact of writing choices are irrelevant, missing, incoherent, and/or consistently unsuccessful.	Score:
Google Sites Portfolio: Creator adheres to the instructions, creating a complete, single-page website to showcase the semester's summative assessments. All links to required semester documents are present.	4 All documents present and all instructions followed.		2 1-2 documents are missing or incomplete. Some instructions are not followed or misunderstood.	1 3+ documents are missing or incomplete. Most instructions are not followed or misunderstood.	
Content: (x2) Writer addresses provided questions by discussing writing identity, short story, and learning, making claims, and explaining and elaborating on support.	4 synthesis	3 analysis	2 uneven or undeveloped analysis	1 summary or missing content	x2
Support: (x2) Writer includes experiences and excerpts from own notes, drafts, and final pieces to support content. Writer may incorporate additional outside material.	4	3	2	1	x2
Style: Writer adheres to guidelines, utilizing appropriate perspective, structure, syntax, diction, formality, visuals, and/or wordiness appropriate for task.	4	3	2	1	
Writing Mechanics: Product is clearly proofread for universal errors; any remaining errors do not detract from meaning or fluency of piece.	4	3	2	1	
				TOTAL:	

28-24   A range   23-18 B range   17-12 C range   11-7 D range   6-0 F

Short Story Rubric - *Creative Writing*

	Ready to Submit to a Publisher 5	Accomplished Draft 4	Working Draft 3	Early Stages 2	Basic notes 1
Plot Structure and Conflict	The writer develops and controls captivating rising tension and events with resolution within the story. Events show careful consideration and thought, tying events together from various plot points that lead to stronger conflict and climactic moments. Conflict is not overly explicit but is embedded in character and dialogue.	The writer develops mindful rising and falling events and resolution within the story. Events show consideration and thought. Conflict is not overly explicit but mainly comes through in character and dialogue.	The writer displays rising, falling events but may lack in areas such as climax and resolution. Events may not show careful consideration. Conflict is sometimes apparent in dialogue, characterization, and narration and needs to be more implied. Tension may not be present in scenes.	The writer does not follow a thoughtful or complete structure. Conflict does not show in dialogue or characterization or is too explicitly stated.	Story fails to touch upon climax, conflict or resolution.
Characterization	Characters are dynamic, three-dimensional and lend themselves naturally to the conflict in the story. Elaborative descriptive details are provided through direct and indirect characterization for the reader to gain a strong sense of each key character. Minor characters are placed mindfully in the story to enhance plot.	Characters are three-dimensional and lend themselves to conflict in story. Developed descriptive details are provided for the reader to gain a sense of each key character through indirect and direct characterization. Minor characters are placed in story.	Characters may not show a "roundness" to them. More detail is needed to gain a sense of the character or conflict. Minor characters are in the story but may not serve a purposeful role.	Characters lack detail, reader sees major characters as mainly "flat", not lending to the conflict of the story. Minor characters are either not present or not purposeful.	Story fails to succeed in characters beyond the "flat" status.
Point of View	Story's point of view maximizes the conflict and characters with mindfulness to plot and genre. POV remains consistent.	Story's point of view enhances the conflict, plot, and genre. POV remains consistent.	Story's point of view may not support conflict, plot, or genre. POV is mainly consistent.	Story's point of view is inconsistent, ineffective, confusing, and/or requires reconsideration for conflict, plot, genre.	Story fails to employ one distinguished and thoughtful point of view.
Dialogue	Dialogue is realistic, balanced, and purposeful to enhance conflict, mood, and character.	Dialogue is realistic and necessary, not clichéd or over-informative, to enhance conflict, mood, and character.	Dialogue may not be realistic and/or punctuated correctly, or may be overly informative to link plot points together too easily (summarize).	Dialogue is inappropriately punctuated, or used as filler rather than to enhance conflict, mood, and character	Dialogue is not used correctly or at all. Dialogue detracts from multiple areas.
Setting	Setting is clever, unique, rich in detail. Setting is used to the advantage of the plot and characters, and enhances or establishes the mood of the story or the tone of the author.	Setting is rich in detail. Setting is used to aid the plot, interact with characters, and establish the mood of the story.	Setting provides some details that may not aid in the advancement of plot or characters. Setting's detail lacks mood. Setting locations are somewhat hackneyed.	Setting lacks in detail or purpose, setting locations are somewhat clichéd/hackneyed.	Story fails to establish setting.
Diction/Detail	Clever use of diction to indicate mood and tone of piece. Detail is vivid, added descriptors for imagery and well thought out use of adjectives to complete the piece. Diction/detail is consistent and appropriate for genre and characters.	Diction lends itself to mood or tone, detail is used to enhance imagery of setting/characters. Diction/detail is consistent and appropriate for genre and characters.	Diction may not be well considered for the mood or tone of the piece. Descriptive detail is lacking in variety. Diction/detail is mainly consistent and appropriate for genre and characters.	Diction is weak, not lending to mood or tone appropriately, descriptions are weak and do not provide a mental picture for the reader throughout the story. Diction/detail is inconsistent and inappropriate for genre and characters.	Story fails to meet success in this area, insufficient.
Writing Conventions and Mechanics	Demonstrates sophistication and a complex understanding of the impact of syntax and grammar. Product is clearly proofread for universal errors. Tense is consistent and chosen purposefully.	Errors in syntax and grammar <u>do not</u> detract from meaning and fluency of argument. Product is clearly proofread for universal errors. Tense is consistent.	Errors in syntax and grammar detract at times from meaning and fluency of story. Product has been proofread for some universal errors. Tense shifts are minimal.	Errors in syntax and grammar detract from meaning and fluency of argument. Product is not clearly proofread for universal errors. Tense shifts are abrupt and many.	Too many errors to consider for review. Product is not proofread for universal errors. Tense is mostly inconsistent.

Scoring for 2nd Full Draft of Short Story

	93-100	Exemplary - the majority of focus areas fall in **accomplished draft categories category or higher**, as the writer clearly **evaluated** the effectiveness of and **designed** their writing choices purposely. The **thoughtfully constructed story** includes **cohesive examples of consistently nuanced** writing choices.
	83-92	Goal - the majority of focus areas fall in **working draft categories or higher**, as the writer clearly **analyzed** the effectiveness of and **developed** their writing choices. The **developed story** includes **mostly thoughtful examples of consistent writing choices** that generally work together.
	73-82	Working Towards Goal - the majority of focus areas fall in **early stage categories or higher**, as the writer **applied some** effective writing choices. Although the story has **some examples of thoughtful and consistent writing choices**, the author **needs more elaboration to develop** the piece.
	63-72	Needs Support - the majority of focus areas fall in **early stage categories or lower**, as the writer **inconsistently applied few** effective writing choices. The outlined story includes **isolated examples of writing choices that** are **incohesive** and **inconsistent**.
	0-62	Unacceptable - the majority of the focus areas fall in **basic notes categories**, as the writer **rarely applied writing choices**. The **notes** includes **undeveloped ideas**.

Scoring for Final Draft of Short Story

	94-100	Exemplary - the majority of focus areas fall in **ready to submit category**, as the writer clearly **evaluated** the effectiveness of and **designed** their writing choices purposely. The **thoughtfully constructed story** includes **cohesive examples of consistently nuanced** writing choices.
	83-93	Goal - the majority of focus areas fall in **accomplished draft categories or higher**, as the writer clearly **analyzed** the effectiveness of and **developed** their writing choices. The **developed story** includes **mostly thoughtful examples of consistent writing choices** that generally work together.
	73-82	Working Towards Goal - the majority of focus areas fall in **working draft categories or higher**, as the writer **applied some** effective writing choices. Although the story has **some examples of thoughtful and consistent writing choices**, the author **needs more elaboration to develop** the piece.
	63-72	Needs Support - the majority of focus areas fall in **early stage categories or higher**, as the writer **inconsistently applied few** effective writing choices. The outlined story includes **isolated examples of writing choices that** are **incohesive** and **inconsistent**.
	0-62	Unacceptable - the majority of the focus areas fall in **early stage categories or lower**, as the writer **rarely applied writing choices**. The **notes** include **undeveloped ideas**.

OTHER RESOURCES

"The Art and Craft of Storytelling." The Moth, www.themoth.org/.

Snap Judgment. Web. <http://snapjudgment.org/>. NPR's spoken word podcast. Audio and video performances which will inspire.

TED: Ideas worth Spreading. Web. <http://www.ted.com/>. Thought-provoking videos covering a variety of topics.

The New York Times. The New York Times. Web. <http://www.nytimes.com/>. A great source for high quality nonfiction.

"The Online Writing Lab at Purdue (OWL)." Web. <https://owl.english.purdue.edu/>. Online resource for all MLA related questions.

"VlogBrothers." Web. <http://www.youtube.com/user/vlogbrothers>. Thought-provoking and at times irreverent view of the world around us.

Creative Writing - Final Exam
"Writing and learning and thinking are the same process." - William Zinner

For your final exam, after finalizing your digital writing portfolio over the last week of class, **produce an author's note** to accompany it. An author's note is an opportunity for you to communicate directly with your readers about your writing. In it, you explain and elaborate on your writing processes, your choices and craft, revisions, what you have learned, and how you have grown as a writer.

Answer the following questions as you compose your author's note, combining your insight about your experiences and direct evidence from your own writing. Quote yourself, excerpts from your notes, drafts, and final written pieces, and then discuss what these pieces reveal about you as a writer.

Content of Author's Note:

- Writing Identity:

    - What type of writer were you when you started this class?
    - How have you grown/changed?
    - Why did you (or didn't you) grow/change?

"The best part of writing is really to educate yourself. I don't want to be anybody's expert. I came in to learn."
— Ta-Nehisi Coates, NY Times

- Short Story Writing Process:

    - Outline the genesis (creation) of your short story project from conception to revision to the final draft you recently submitted
    - (include discussion of class activities, inspirations, assignments, visual story map/plot structure outline, guided meditation, feedback, research, setbacks, successes, etc.);

- Learning:

    - What have you learned about writing through writing and the semester? How?
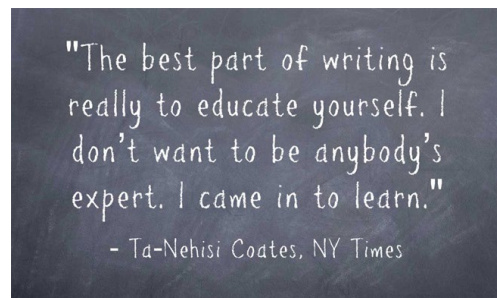
- You could discuss: characterization, personality, setting, perspective, sensory details, dialogue, word choice, verb tense, reflection, narrative writing, plot, pacing, conflict, tension, etc.
    - What have you learned about yourself through writing and the semester? How?
    - Describe your take-aways as a writer, learner, and thinker.

Style:

- 1st person point-of-view (I, me, my, mine);
- Writing is <u>formal</u> in terms of proper capitalization, punctuation, varied sentence structure, paragraphing, and diction. Contractions are allowed, but avoid incomplete sentences and slang without purpose.
- You can include visuals you find or create in your piece to represent yourself as a writer or the characters you developed. Be sure to reference the visuals you include in your note.

Format:

- Minimum two (2) pages, double-spaced;
- Times New Roman, size 12, double-spaced, 1-inch margins.

Creating a Single Page Writing Portfolio with Google Sites:

Using your trumbullps.net account, you will create a NEW Google Site to showcase your summative writing assessments this semester.

1. Go to www.google.com

2. In the upper right corner, click on the Google Apps widget

3. Select 'Sites'

4. On the Google Sites page, select 'Create in NEW sites'

5. Create a Name: Student Name's Writing Portfolio   ex. Mrs. Kravecs' Writing Portfolio

6. Choose a 'Theme' on the right side of the page editor, selecting colors and fonts

7. Add Documents to the main page one at a time, shrinking them to fit. *You can line them up in rows as on my sample site.

    *9 total documents to add:

    a. Writing History Reflection

    b. College Essay Revision with Reflective Commentary

    c. Enneagram Initial Reflection

    d. Food or Film Review

    e. Short Story Guided Meditation (Day 1)

    f. Opening Lines Critique Revision and Reflection

    g. Guided Meditation Day 2

    h. Final Draft of Short Story

    i. Author's Note (once completed)

8. Share your site with me: kkravecs@trumbullps.net using the feature in the upper right corner

9. After you finish adding all of the required documents and making it visually pleasing, select 'Publish' in the upper right corner.

10. Submit both your Author's Note and your Digital Writing Portfolio to Google Classroom (via link or attachment).

For an example, visit my site: https://sites.google.com/trumbullps.net/mrskravecscw/home

Excerpts from Author's Notes:

"One of the most interesting things to me about narrative time is how it tends not to work in the ways people delineate time; very few stories account for the seconds and minutes of a day. But it does mimic the way the brain tends to process things. Small, inconsequential moments move quickly, often in phrases if they need to be noted in the story, sometimes not even worth making it onto the page. But the moments where a character and the reader pause and consider are heavier. They expand and take up more of the story's space."

—Megan Giddings, "Vacations"

"The story would go cold for months or a year, then I'd hear or see or read or remember something that would spur (ahem) me to trot (ahem) it out again. With each new vignette, I would print the story and lay it out on my office floor, rearranging the sections in a way that seemed most likely to engage and reward the reader. I never thought it would be finished, let alone published."

—Bret Anthony Johnston, "Half of What Atlee Rouse Knows About Horses"

"But I don't want to suggest I was conscious of these craft choices in the drafting of the story. It's not unlike the art of getting dressed, which is informed by daily practice, rules long internalized (experience rendering some broken, others sacred), so that you can visualize what would work before ever putting it on, and yet there is still room for surprise, shapes that do not come together as they did in the mind, or combinations that absolutely should not work, but are transformed on the body."

—Melissa Yancy, "Dog Years"

"It is a story about conflicts between two characters, within one character, and with the environment. Maren and Jeff's relationship directly maps onto the landscape they are lost in: increasingly uncertain, without a way forward, no means of returning to what was, and ultimately resulting in separation …One of my favorite examples of a story's use of place is John Cheever's "The Swimmer." The landscape is at once richly realized and also highly subjective, symbolic, and increasingly surreal. I wanted to explore something similar here, with the landscape a real physical place and also a purely subjective experience, at first between two characters and then within only one."

—Michael Sheehan, "Cathedral"

"The state of being afraid weirdly connects Americans across the spectrum right now – people who otherwise think they don't share anything in common. Everyone is anxious, and this universal state of fear puts people into situations where they can be manipulated more easily. The horror genre is a double-edged sword in this regard, since it contributes to the climate of fear but also can offer the chance to confront and challenge our worst fears in a fictional space that makes it safer, perhaps, or more distanced, at least."

—J.M. Tyree, "Parenthood"

TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

ACP ALGEBRA I Extended Year Two
Grade 9
Mathematics Department
2021

Curriculum Writing Team

Elizabeth Capobianco	**Teacher**
Brian Darrow Jr.	**Teacher**
Allison DelBene	**Teacher**
Nicole Trommelen	**Teacher**
Beth Wilock	**Teacher**
Katie Laird	**Mathematics Department Chairperson**
Susan Iwanicki, Ed.D.	**Assistant Superintendent**

Algebra 1 Extended Year Two
Table of Contents

The Trumbull Board of Education will continue to take Affirmative Action to ensure that no persons are discriminated against in its employment.

CORE VALUES AND BELIEFS

The Trumbull School Community engages in an environment conducive to learning which believes that all students will **read** and **write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

Algebra 1 Extended Year Two is a prerequisite for all high school and college mathematics and thus provides a necessary foundation for higher-level mathematics. Students develop abstract reasoning and critical thinking skills, develop a better understanding of the world in which they live, and become better able to correctly apply mathematical knowledge when required. The focus areas of Algebra 1 Extended Year Two help students gain strong foundations, including a solid understanding of concepts, a high degree of procedural skill and fluency, and the ability to apply the math they know to solve problems inside and outside the classroom.

The *Algebra 1* textbook by Pearson (2015) offers a blended print and digital curriculum that is built on a foundation of problem solving and visual learning. This curriculum guide has been updated to reflect the new resources provided by the textbook, including technology. Additionally, some topics within the course have been reordered. Based upon student and teacher feedback from upper-level courses, student performance, and the requirements of the redesigned SAT, topics have been added to increase the rigor of Algebra 1 Year Two.

Students should have completed Algebra 1 Extended Year One prior to Algebra 1 Extended Year Two. After successful completion of Algebra 1 Extended Year Two, students will be prepared to take Geometry and Algebra II.

Algebra 1 Extended Year Two is only offered at Trumbull High School for students whose performance suggests that they are cognitively ready to attain the standards.

COURSE GOALS

Algebra 1 Extended Year Two takes a balanced instructional approach to promote the understanding of important mathematical concepts, skills, procedures, and ways of thinking and reasoning.

The following course goals derive from the 2010 Connecticut Core Standards for Mathematical Content.

N-RN   The Real Number System
Extend the properties of exponents to radical exponents. Use properties of rational and irrational numbers.

N-Q   Quantities
Reason quantitatively and use units to solve problems.

A-SSE   Seeing Structure in Expressions
Interpret the structure of expressions. Write expressions in equivalent forms to solve problems.

A-APR   Arithmetic with Polynomials and Rational Expressions
Perform arithmetic operations on polynomials. Understand the relationship between zeros and factors of polynomials.

A-CED   Creating Equations
Create equations that describe numbers or relationships.

A-REI   Reasoning with Equations and Inequalities
Understand solving equations as a process of reasoning and explain the reasoning. Solve equations and inequalities in one variable. Solve systems of equations. Represent and solve equations and inequalities graphically.

F-IF   Interpreting Functions
Understand the concept of a function and use function notation. Interpret functions that arise in applications in terms of the context. Analyze functions using different representations.

F-BF   Building Functions
Build a function that models a relationship between two quantities. Build new functions from existing functions.

F-LE   Linear, Quadratic, and Exponential Models
Construct and compare linear, quadratic, and exponential models and solve problems. Interpret expressions for functions in terms of the situation they model.

S-ID   Interpreting Categorical and Quantitative Data
Summarize, represent, and interpret data on a single count or measurement variable. Summarize, represent, and interpret data on two categorical and quantitative variables. Interpret linear models.

S-IC   Making Inferences and Justifying Conclusions
Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

S-CP   Conditional Probability and the Rules of Probability
Understand independence and conditional probability and use them to interpret data.

The following course goals derive from the 2010 Connecticut Core Standards for Mathematical Practices, which describe varieties of expertise that all teachers of mathematics will develop in their students. These practices rest on important "processes and proficiencies" that have long been valued in mathematics education.

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved.

Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples.

They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is.

4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.

Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and the tools' limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects.

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

The following course goals derive from the 2014 International Society for Technology in Education Standards.

1. Creativity and Innovation – Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
2. 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.
3. Research and Information Fluency – Students apply digital tools to gather, evaluate, and use information.
4. 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.
5. Digital Citizenship – Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

COURSE ENDURING UNDERSTANDINGS

Students will understand that . . .
· linear, exponential, and quadratic equations can be used to model real-life situations, develop inferences, and make informed decisions.

· technology can help them analyze, organize, and display data to support their conclusions.

COURSE ESSENTIAL QUESTIONS

· How can we take real-life data and model it mathematically?

· How can linear, exponential, and quadratic equations help us make informed decisions about the world around us?

· How can we use graphing calculators to translate real-life data into mathematical models?

COURSE KNOWLEDGE & SKILLS

Students will understand . . .
- the key vocabulary of algebraic mathematics;
- algebraic expression, coefficient, constant, distributive property, linear inequalities, real numbers, variable;
- dependent variable, domain, function, function notation, independent variable, linear function, mapping diagram, non-linear function, parabola, range, relation, vertical line test;
- causation, correlation, correlation coefficient, extrapolation, initial value, interpolation, line of best fit, linear model, parameter, point-slope form, rate of change, scale, scatterplot, slope, slope-intercept form, standard form, regression expression, regression line, trend line, unit rate, velocity, x-intercept, y-intercept;
- break-even point, elimination method for solving systems of equations, fixed cost, graphing method for solving systems of equations, profit, revenue, solution of a system of linear equations, substitution method for solving systems, system of linear equations, system of linear inequalities;
- compound interest, decay factor, doubling time, exponential decay, exponential function, exponential growth, growth factor, half-life, laws of exponents, radical expressions, rate of change;
- ascending order, axis of symmetry, binomial, degree, descending order, difference of two squares, discriminant, expanded form, factored form, factoring by grouping, leading coefficient, maximum, minimum, monomial, perfect square trinomial, quadratic, quadratic formula, quadratic function, quadratic equation, root, standard form of a quadratic equation, trinomial, vertex, zero product property; and
- box-and-whisker plot, interquartile range (IQR), mean, measures of central tendency, median, mode, outlier, quartile, range.

Students will be able to . . .
- solve multi-step equations and linear inequalities with and without the use of a calculator.
- use graphing and statistical functions of a graphing calculator.
- represent functions using tables, equations, and graphs.
- use function notation.
- write linear equations.
- find the line of best fit, analyze trend lines, and make scatterplots.
- solve systems of inequalities by graphing.
- learn the rules of exponents and use them to simplify expressions.
- identify the parameters of exponential functions and how they affect the graph of a function.
- apply exponential functions to real-world situations.
- add, subtract, and simplify radicals.
- rationalize the denominator of radicals.
- add, subtract, and multiply polynomials.
- factor polynomials.

- solve quadratic equations.
- graph a parabola using the intercepts and vertex.
- describe a data set using measures of central tendency.
- organize data in displays such as frequency tables, histograms, and box-and-whisker plots.
- identify outliers and explain how they affect the spread of data

COURSE SYLLABUS

Course Name
> Algebra 1 Extended Year Two

Level
> Advanced College-Preparatory

Prerequisites
> Completion of Algebra 1 Extended Year One

Materials Required
> TI-84 graphing calculator

General Description of the Course
> Algebra 1 Extended Year Two is designed to develop the eight standards of mathematical practice in students. The course is broken into fourteen units of study. Students will solve linear equations and inequalities. They will explore functions and derive linear models in order to analyze situations, make predictions, and solve problems. Students will study scatterplots and trend lines as well as measures of central tendency. They will solve systems of equations graphically, numerically, and algebraically and make choices between competing situations in real-world contexts. Exponents and exponential equations are investigated. Students will study quadratic equations and functions. They will apply them to real life applications. The course concludes with the study of one-variable statistics.

Assured Assessments
> Students will be evaluated by their performance on formative assessments (reflection/journal entries, exit slips, formative performance tasks) as well as summative assessments (common end-of-unit assessments), and departmental midterm and final examinations.

Core Text
Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.

UNIT 1
Solving Linear Equations

Time Allotment: Approximately 2 Weeks

Unit Goals: At the completion of this unit, students will:

A-SSE   Seeing Structure in Expressions
Interpret the structure of expressions.
　　　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.*

A-CED   Creating Equations
Create equations that describe numbers or relationships.
　　　1.　　Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

　　　4.　　Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law $V = IR$ to highlight resistance R.*

A-REI   Reasoning with Equations and Inequalities
Understand solving equations as a process of reasoning and explain the reasoning.
　　　1.　Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Solve equations and inequalities in one variable.
　　　3.　Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

N-RN   The Real Number System
Use properties of rational and irrational numbers.
　　　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.

N-Q   Quantities
Reason quantitatively and use units to solve problems.

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.

Unit Essential Questions
- How can I use linear equations to solve real-world problems?
- What is a solution set for a linear equation?

- Students will write, simplify, evaluate, and model situations involving linear equations.
- Students will then examine the concept of equality and use linear equations to model and solve real-world problems.

Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

·   Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  o Sections 2-1, 2-2, 2-3, 2-4, 2-5

UNIT 2
Solving Linear Inequalities & Ratios, Proportions & Percents

Time Allotment: Approximately 2 Weeks

Unit Goals: At the completion of this unit, students will:

A-SSE   Seeing Structure in Expressions
Interpret the structure of expressions.
      2.   Interpret expressions that represent a quantity in terms of its context.

            c.   Interpret parts of an expression, such as terms, factors, and coefficients.

            d.   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.*

A-CED   Creating Equations
Create equations that describe numbers or relationships.
      2.   Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

      5.   Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law $V = IR$ to highlight resistance R.*

A-REI   Reasoning with Equations and Inequalities
Understand solving equations as a process of reasoning and explain the reasoning.
      2.   Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Solve equations and inequalities in one variable.
      4.   Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

N-RN   The Real Number System
Use properties of rational and irrational numbers.
      4.   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.

N-Q   Quantities
Reason quantitatively and use units to solve problems.

4.   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.

5.   Define appropriate quantities for the purpose of descriptive modeling.

6.   Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Unit Essential Questions
- How can I use linear inequalities to solve real-world problems?
- What is a solution set for linear inequality?
- What kinds of relationships can proportions represent?

Scope and Sequence
- Students will write, simplify, evaluate, and model situations involving linear inequalities.
- Students will then examine the concept of linear inequalities to model and solve real-world problems.
- Students will determine unknowns in problems involving ratios and percents.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

<u>Core</u>

·   Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
   o   Sections 2-7, 2-9, 3-1, 3-2, 3-3, & 3-4

UNIT 3
Functions

Time Allotment: Approximately 2.5 weeks

Unit Goals

At the completion of this unit, students will:

N-Q   Quantities
Reason quantitatively and use units to solve problems.
      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.

A-SSE   Seeing Structure in Expressions
Interpret the structure of expressions.
      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.*

A-CED   Creating Equations
Create equations that describe numbers or relationships.
      2.   Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A-REI   Reasoning with Equations and Inequalities
Represent and solve equations and inequalities graphically.
      10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

Unit Essential Questions

- What is a function?
- What are the different ways in which functions may be represented?
- How can functions be used to model real-world situations, make predictions, and solve problems?

Scope and Sequence

- Students will be introduced to the concept of a function.
- After identifying relationships that are not functions, students will learn how to define the domain and range of a discrete function.
- Students will organize and analyze data in tables and graphs and use the information to describe relationships.
- Students will be introduced to function notation and will evaluate functions.
- Students will be exposed to a variety of functions, with emphasis on distinguishing between linear functions and nonlinear functions.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

- Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  - Sections 4-1, 4-2, 4-3, 4-4, 4-5, & 4-6 (set builder notation)

UNIT 4
Linear Functions

Time Allotment: Approximately 3-4 weeks

Unit Goals

At the completion of this unit, students will:

N-Q   Quantities
Reason quantitatively and use units to solve problems.

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.

A-SSE <u>Seeing Structure in Expressions</u>
Interpret the structure of expressions.
1. Interpret expressions that represent a quantity in terms of its context.

   a. Interpret parts of an expression, such as terms, factors, and coefficients.

2. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

A-CED <u>Creating Equations</u>
Create equations that describe numbers or relationships.
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

F-IF <u>Interpreting Functions</u>
Interpret functions that arise in applications in terms of the context.
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*

6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Analyze functions using different representations.
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

   a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

   b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

F-LE <u>Linear, Quadratic, and Exponential Models</u>
Interpret expressions for functions in terms of the situation they model.
5. Interpret the parameters in a linear or exponential function in terms of a context.

Unit Essential Questions

- What are the different ways in which linear functions may be represented?

- What is the significance of a linear function's slope and *y*-intercept?
- How can linear functions model real-world situations?
- How can linear functions help analyze real-world situations and solve practical problems?

Scope and Sequence

- Students will derive linear models of real-world situations in order to analyze situations, make predictions, and/or solve problems.
- Analyzing situations will often take the form of identifying the real-world meaning of the slope and the *x*- and *y*-intercepts of a linear model.
- Making predictions will involve evaluating models for a given independent variable (given *x*, find *y*) and solving equations for the independent variable given the dependent variable (given *y*, find *x*).
- Problem-solving will occur through the use of various representations: algebraic, tabular, graphic, and numeric.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

- Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  - Sections 5-1, 5-3, 5-4, 5-5, 5-6

UNIT 5
Systems of Linear Equations

Time Allotment: Approximately 2 weeks

Unit Goals

At the completion of this unit, students will:

N-Q   <u>Quantities</u>
Reason quantitatively and use units to solve problems.
> 2.   Define appropriate quantities for the purpose of descriptive modeling.
>
> 3.   Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A-CED   <u>Creating Equations</u>
Create equations that describe numbers or relationships.
> 3.   Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

A-REI   <u>Reasoning with Equations and Inequalities</u>
Solve systems of equations.
> 5.   Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
>
> 6.   Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Represent and solve equations and inequalities graphically.
> 11. Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make table of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
>
> 12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Unit Essential Questions
- What does the number of solutions (none, one, or infinite) of a system of linear equations represent?

- What are the advantages and disadvantages to solving a system of linear equations graphically versus algebraically?

Scope and Sequence
- Students will represent, compare, and analyze two linear equations, look for common solutions, and use this information to make choices between competing situations in real-world contexts.
- Students will solve systems of equations graphically, and algebraically.
- Students will explain what the solution of a system of linear equations represents in the contexts of various applications.
- Students will explore the special cases of parallel lines (no solution) and identical lines (infinite solutions).

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

- Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  - Sections 6-1, 6-2, 6-3, 6-4

UNIT 6
System of Linear Equalities

Time Allotment: Approximately 1 week

Unit Goals

At the completion of this unit, students will:

N-Q   Quantities
Reason quantitatively and use units to solve problems.
4.   Define appropriate quantities for the purpose of descriptive modeling.

5.	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A-CED	Creating Equations

Create equations that describe numbers or relationships.

4.	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

A-REI	Reasoning with Equations and Inequalities

Solve systems of equations.

7.	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

8.	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Represent and solve equations and inequalities graphically.

13. Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make table of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

14. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Unit Essential Questions
- What does a solution to a linear inequality look like?
- What does the number of solutions of a system of linear inequalities represent?

Scope and Sequence
- Students will graph linear inequalities.
- Students will represent, compare, and analyze two linear inequalities, and look for common solutions.
- Students will explore the special cases of linear inequalities.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

> ·   Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
> o   Sections 6-5, 6-6

Unit 7

Exponent Properties

Time Allotment: Approximately 1-2 weeks

Unit Goals

At the completion of this unit, students will:

8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.

N-RN   The Real Number System
Extend the properties of exponents to rational exponents.
1.   Explain how the definition of the meaning of radical exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.*

2.   Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Unit Essential Questions

- How can you simplify expressions using exponents?

Scope and Sequence
- Students will investigate properties of exponents including multiplying and dividing monomials.
- Students will explore the meaning of negative and zero exponents.
 Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

<u>Core</u>

· Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  o Sections 7-1, 7-2, 7-3, 7-4

Unit 8

Exponential Functions

Time Allotment: Approximately 1-2 week

Unit Goals

At the completion of this unit, students will:

A-SSE   <u>Seeing Structure in Expressions</u>
Interpret the structure of expressions.
  1.   Interpret expressions that represent a quantity in terms of its context.

  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.*

Write expressions in equivalent forms to solve problems.
  3.   Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

  c.   Use the properties of exponents to transform expressions for exponential functions. *For example, the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*

A-CED   <u>Creating Equations</u>

Create equations that describe numbers or relationships.

      2.   Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

      3.   Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

A-REI   Reasoning with Equations and Inequalities

Represent and solve equations and inequalities graphically.

      10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

F-BF   Building Functions

Build new functions from existing functions.

      3.   Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graph. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

F-LE   Linear, Quadratic, and Exponential Models

Interpret expressions for functions in terms of the situation they model.

      7.   Interpret the parameters in a linear or exponential function in terms of a context.

Unit Essential Questions

- What characterizes exponential growth and decay?
- What are real-world models of exponential growth and decay?
- What are the limitations of exponential growth models?
- How can I differentiate an exponential model from a linear model given a real-world data set?

Scope and Sequence

- Students will derive exponential models of real-world situations in order to analyze situations, make predictions, and/or solve problems.
- Analyzing situations will often take the form of identifying the real-world meaning of the initial value and the growth/decay factor.
- Making predictions will involve evaluating models for a given independent variable (given x, find y).

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

<u>Core</u>

·	Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
    o	Sections 7-6, 7-7

UNIT 9
Polynomials

Time Allotment: Approximately 2 weeks

Unit Goals

<p align="center">At the completion of this unit, students will:</p>

A-SSE	<u>Seeing Structure in Expressions</u>
Interpret the structure of expressions.
　　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.	Use the structure of an expression to identify ways to rewrite it. *For example, see* $x^4 - y^4$ *as* $(x^2)^2 - (y^2)^2$, *thus recognizing it as a difference of squares that can be factored as* $(x^2 - y^2)(x^2 + y^2)$.

A-APR	<u>Arithmetic with Polynomials and Rational Expressions</u>
Perform arithmetic operations on polynomials.
　　1.	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Unit Essential Questions
- Can two algebraic expressions that appear to be different be equivalent?

Scope and Sequence
- Students will identify polynomials by number of terms and degree.
- Students will learn to add, subtract, and multiply polynomials.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

     ·   Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
           o   Sections 8-1, 8-2, 8-3, 8-4

UNIT 10
Factoring

Time Allotment: Approximately 3 weeks

Unit Goals

At the completion of this unit, students will:

A-SSE   <u>Seeing Structure in Expressions</u>
Interpret the structure of expressions.
     3.   Interpret expressions that represent a quantity in terms of its context.

          c.   Interpret parts of an expression, such as terms, factors, and coefficients.

          d.   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.*

4.   Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

Write expressions in equivalent forms to solve problems.
5.   Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

A-APR   Arithmetic with Polynomials and Rational Expressions
Perform arithmetic operations on polynomials.
2.   Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Unit Essential Questions
- How is the factoring of polynomials related to the multiplication of polynomials?

Scope and Sequence
- Students will identify and factor the GCF from polynomials.
- Students will factor specials cases including binomials (difference of squares)
- Students will factor trinomials.
- Students will factor by grouping.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

- Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  - Sections 8-2, 8-5, 8-6, 8-7, 8-8

<div align="center">

Unit 11
Radicals

</div>

Time Allotment: Approximately 2.5 weeks

Unit Goals

<div align="center">

At the completion of this unit, students will:

</div>

N-RN   The Real Number System
Extend the properties of exponents to rational exponents.
> 3.   Explain how the definition of the meaning of radical exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3$ = $5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.*

> 4.   Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Unit Essential Questions
   * How can I simplify a radical expression?

Scope and Sequence
   * Students will simplify radical expressions involving square roots.
   * Students will simplify radical expressions, including those with variables.
   * Students will add, subtract and multiply radical expressions.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

 Resources

 Core

   ·   Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
         o   Sections 10-2, 10-3

UNIT 12
Solving Quadratics

Time Allotment: Approximately 3 weeks

Unit Goals

<p align="center">At the completion of this unit, students will:</p>

A-SSE <u>Seeing Structure in Expressions</u>
Interpret the structure of expressions.
  6. Interpret expressions that represent a quantity in terms of its context.

    e. Interpret parts of an expression, such as terms, factors, and coefficients.

    f. 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.*

  7. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

Write expressions in equivalent forms to solve problems.
  8. 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.

A-APR <u>Arithmetic with Polynomials and Rational Expressions</u>
Perform arithmetic operations on polynomials.
  3. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Understand the relationship between zeros and factors of polynomials.
  3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

Unit Essential Questions

- How do I choose the best method for solving a quadratic equation?

Scope and Sequence
- Students will explore the zero product property.
- Students will solve quadratics by factoring, the quadratic formula, and the square root property.
- Students will understand how to leave solutions in exact and approximated forms.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

- Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  - Sections 9-3, 9-4, & 9-6

UNIT 13
Graphing Quadratic Functions

Time Allotment: Approximately 2 weeks

Unit Goals

At the completion of this unit, students will:

A-SSE   <u>Seeing Structure in Expressions</u>
Interpret the structure of expressions.
     9.   Interpret expressions that represent a quantity in terms of its context.

         g.   Interpret parts of an expression, such as terms, factors, and coefficients.

         h.   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.*

     10. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

Write expressions in equivalent forms to solve problems.
     11. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

         c.   Factor a quadratic expression to reveal the zeros of the function it defines.

         d.   Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

A-APR   <u>Arithmetic with Polynomials and Rational Expressions</u>
Perform arithmetic operations on polynomials.
     4.   Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Understand the relationship between zeros and factors of polynomials.
     4.   Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

A-CED   <u>Creating Equations</u>
Create equations that describe numbers or relationships.
     1.   Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

2.   Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

3.   Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

4.   Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*

F-IF   Interpreting Functions
Interpret functions that arise in applications in terms of the context.
     4.   For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*

5.   Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*

F-LE   Linear, Quadratic, and Exponential Models
Construct and compare linear, quadratic, and exponential models and solve problems.
     1.   Distinguish between situations that can be modeled with linear functions and with exponential functions.

          a.   Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

          b.   Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

          c.   Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

2.   Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

3.   Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

4.   For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.

Unit Essential Questions

- What can the intercepts, vertex (maximum or minimum) and other features of a quadratic function tell me about real-world relationships?
- How can technology support investigation of and experimentation with the ways that parameters affect functions?

Scope and Sequence

- Students will graph quadratics
- Students will find x-intercepts of quadratics algebraically and graphically.
- Students will find the vertex and axis of symmetry algebraically and graphically.
- Students will utilize their graphing calculators to graph quadratic equations.
- Students will explore the many applications of quadratics in everyday life.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

<u>Core</u>

- Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.
  - Sections 9-1, 9-2, 9-3

UNIT 14
Statistics

Time Allotment: Approximately 2 weeks (time permitting)

Unit Goals

At the completion of this unit, students will:

N-Q   <u>Quantities</u>
Reason quantitatively and use units to solve problems.
    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.

S-ID   <u>Interpreting Categorical and Quantitative Data</u>
Summarize, represent, and interpret data on a single count or measurement variable.
    1.   Represent data with plots on the real number line (dot plots, histograms, and box plots).

    2.   Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

    3.   Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

    4.   Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

Interpret linear models.
    7.   Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
    8.   Compute (using technology) and interpret the correlation coefficient of a linear fit.
    9.   Distinguish between correlation and causation.

Summarize, represent, and interpret data on two categorical and quantitative variables.
    5.   Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

Unit Essential Questions

- How can I make predictions and informed decisions based on current numerical information?
- What are the advantages and disadvantages to analyzing data by hand versus by using technology?
- What is the potential impact of making a decision from data that contains one or more outliers?

Scope and Sequence
- Students will explore measures of central tendency and spread and displays of one-variable data, including box-and-whisker plots.
- Students will use the five-number summary to create box-and-whisker plots and identify outliers.
- Students will be introduced to using the STAT menu on the graphing calculator.

Assured Assessments

Formative Assessment:

Each student will participate in at least one reflection/journal entry, exit slip, or formative performance task common to all Algebra 1 Extended Year Two teachers.

Summative Assessment:

Each student will take an end-of-unit assessment common to all teachers at the grade level.

Resources

Core

· Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.

o Sections 12-2, 12-3,12-4, 5-7

COURSE CREDIT
One credit in Mathematics

One class period daily for a full year

PREREQUISITES
Completion of Algebra 1 Extended Year One.

TEXT
Charles, Randall I., et al. *Algebra 1*. New York: Pearson, 2015. Print.

SUPPLEMENTARY MATERIALS/RESOURCES/TECHNOLOGY
Department and teacher prepared materials
TI-84 Plus graphing calculators

CURRENT REFERENCES
2010 Connecticut Core Standards for Mathematics

http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

TEACHER GUIDE

Unit 1 – Solving Linear Equations

Approximately 2 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
2-1 Solving One-Step Equations	0.5 day
2-2 Solving Two-Step Equations	0.5 day
2-3 Solving Multi-Step Equations	2 days
2-4 Solving Equations with Variables on Both Sides	2 days
2-5 Literal Equations	2 days

Unit 2 – Rates, Ratios, Proportions, Percents, Inequalities

Approximately 2 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
2-7 Solving Proportions	2 days
2-9 Percents	2 days
3-1 Inequalities & Their Graphs	1 day
3-2 Solving Inequalities Using Addition or Subtraction	0.5 day
3-3 Solving Inequalities Using Multiplication or Division	0.5 day
3-4 Solving Multi-Step Inequalities	1 day

Unit 3 – Functions

Approximately 2.5 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
4-1 Using Graphs to Relate Two Quantities	1 day
4-2 Patterns and Linear Functions	1 day
4-3 Patterns and Nonlinear Functions	1 day
4-4 Graphing a Function Rule	1 day
4-5 Writing a Function Rule	1 day
4-6 Formalizing Relations & Functions	3 days

Unit 4 – Linear Functions

Approximately 3-4 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
5-1 Rate of Change & Slope	1 day
5-3 Slope-Intercept Form	2 days
5-4 Point-Slope Form	2 days
5-5 Standard Form	3 days

5-6 Parallel and Perpendicular Lines   2 days

Unit 5 – Systems
Approximately 2 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
6-1 Solving Systems by Graphing	1 day
6-2 Solving Systems using Substitution	2 days
6-3 Solving Systems using Elimination	2 days
6-4 Applications of Linear Systems	2 days

Unit 6 – Two Variable Inequalities
Approximately 1 week (including end-of-unit review & assessment)

Text Section/Topic	Estimated Time
6-5 Linear Inequalities	2 days
6-6 Systems of Linear Inequalities	2 days

Unit 7 – Exponent Properties
Approximately 1-2 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
7-1 Zero and Negative Exponents	1 day
7-2 Multiplying Powers with the Same Base	1 day
7-3 More Multiplication Properties of Exponents	1 day
7-4 Division Properties of Exponents	1 day

*Midterm review & exam (3-4 days)

Unit 8 – Exponential Functions
Approximately 1-2 week (end-of-unit review & assessment)

Text Section/Topic	Estimated Time
7-6 Exponential Functions	2 days
7-7 Exponential Growth & Decay	2 days

Unit 9 – Polynomials
Approximately 2 weeks (end-of-unit review & assessment)

Text Section/Topic	Estimated Time
8-1 Adding and Subtracting Polynomials	2 days
8-2 Multiplying & Factoring	1 day
8-3 Multiplying Binomials	1 day
8-4 Multiplying Special Cases	1 day

Unit 10 – Factoring
Approximately 3 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
8-2 Multiplying & Factoring	1 day
8-5 Factoring $x^2 + bx + c$	3 days
8-6 Factoring $ax^2 + bx + c$	3 days
8-7 Factoring Special Cases	2 days
8-8 Factoring by Grouping	2 days

Unit 11 – Radicals
Approximately 2.5 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
10-2 Simplifying Radicals	4 days
10-3 Operations with Radical Expressions	4 days

Unit 12 – Solving Quadratics
Approximately 3 weeks (including mid-unit assessment and end-of-unit review & assessment)

Text Section/Topic	Estimated Time
9-3 Solving Quadratic Equations	1 day
9-4 Factoring to Solve Quadratic Equations	2 days
9-6 The Quadratic Formula and the Discriminant	4 days

Unit 13 – Quadratic Functions
Approximately 2 weeks (including end-of-unit review & assessment)

Text Section/Topic	Estimated Time
9-1 Quadratic Graph and Their Properties	2 days
9-2 Quadratic Functions	2 days
9-3 Solving Quadratic Functions	1 day

Unit 14 – Statistics
Approximately 2 weeks (including end-of-unit review & assessment)

Text Section/Topic	Estimated Time
12-2 Frequency and Histograms	1 day
12-3 Measures of Central Tendency and Dispersion	1 day
12-4 Box-and-Whisker Plots	1 day
5-7 Scatter Plots and Trend Lines	2 days

*Final review & exam (3-4 days)

ASSURED STUDENT PERFORMANCE RUBRICS

Rubric 2: Write Effectively

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	• Establishes and maintains a clear purpose • Demonstrates an insightful understanding of audience and task	• Establishes and maintains a purpose • Demonstrates an accurate awareness of audience and task	• Establishes a purpose • Demonstrates an awareness of audience and task	• Does not establish a clear purpose • Demonstrates limited/no awareness of audience and task
Organization X_____	• Reflects sophisticated organization throughout • Demonstrates logical progression of ideas • Maintains a clear focus • Utilizes effective transitions	• Reflects organization throughout • Demonstrates logical progression of ideas • Maintains a focus • Utilizes transitions	• Reflects some organization throughout • Demonstrates logical progression of ideas at times • Maintains a vague focus • May utilize some ineffective transitions	• Reflects little/no organization • Lacks logical progression of ideas • Maintains little/no focus • Utilizes ineffective or no transitions
Content X_____	• Is accurate, explicit, and vivid • Exhibits ideas that are highly developed and enhanced by specific details and examples	• Is accurate and relevant • Exhibits ideas that are developed and supported by details and examples	• May contain some inaccuracies • Exhibits ideas that are partially supported by details and examples	• Is inaccurate and unclear • Exhibits limited/no ideas supported by specific details and examples
Use of Language X_____	• Demonstrates excellent use of language • Demonstrates a highly effective use of standard writing that enhances communication • Contains few or no errors. Errors do not detract from meaning	• Demonstrates competent use of language • Demonstrates effective use of standard writing conventions • Contains few errors. Most errors do not detract from meaning	• Demonstrates use of language • Demonstrates use of standard writing conventions • Contains errors that detract from meaning	• Demonstrates limited competency in use of language • Demonstrates limited use of standard writing conventions • Contains errors that make it difficult to determine meaning

Rubric 3: Problem Solving through Critical Thinking

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	Student demonstrates clear understanding of the problem and the complexities of the task	Student demonstrates sufficient understanding of the problem and most of the complexities of the task	Student demonstrates some understanding of the problem but requires assistance to complete the task	Student demonstrates limited or no understanding of the fundamental problem after assistance with the task
Research X_____	Student gathers compelling information from multiple sources including digital, print, and interpersonal	Student gathers sufficient information from multiple sources including digital, print, and interpersonal	Student gathers some information from few sources including digital, print, and interpersonal	Student gathers limited or no information
Reasoning and Strategies X_____	Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies	Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies	Student demonstrates some critical thinking skills to develop a plan integrating some strategies	Student demonstrates limited or no critical thinking skills and no plan
Final Product and/or Presentation X_____	Solution shows deep understanding of the problem and its components. Solution shows extensive use of 21st Century Technology Skills.	Solution shows sufficient understanding of the problem and its components. Solution shows sufficient use of 21st Century Technology Skills.	Solution shows some understanding of the problem and its components. Solution shows some use of 21st Century Technology Skills.	Solution shows limited or no understanding of the problem and its components. Solution shows limited or no use of 21st Century Technology Skills.

Rubric 5: Independent Learners And Thinkers

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work.	Student demonstrates initiative by generating appropriate questions, creating original projects/work.	Student demonstrates some initiative by generating questions, creating appropriate projects/work.	Student demonstrates limited or no initiative by generating few questions and creating projects/work.
Independent Research & Development X_____	Student is analytical, insightful, and works independently to reach a solution.	Student is analytical, and works productively to reach a solution.	Student reaches a solution with direction.	Student is unable to reach a solution without consistent assistance.
Presentation of Finished Product X_____	Presentation shows compelling evidence of an independent learner and thinker. Solution shows deep understanding of the problem and its components. Solution shows extensive and appropriate application of 21st Century Skills.	Presentation shows clear evidence of an independent learner and thinker. Solution shows adequate understanding of the problem and its components. Solution shows adequate application of 21st Century Skills.	Presentation shows some evidence of an independent learner and thinker. Solution shows some understanding of the problem and its components. Solution shows some application of 21st Century Skills.	Presentation shows limited or no evidence of an independent learner and thinker. Solution shows limited or no understanding of the problem. Solution shows limited or no application of 21st Century Skills.

TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

MATH WORKSHOP II
Grades 11-12
Mathematics Department

2021

Curriculum Writing Team

Katie Laird	**Department Chair**
Nancy Ciborowski	**Teacher**
Susan C. Iwanicki, Ed.D	**Assistant Superintendent**

Math Workshop II
Grades 11-12
Table of Contents

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The Trumbull Board of Education will continue to take Affirmative Action to ensure that no persons are discriminated against in its employment.

CORE VALUES AND BELIEFS

The Trumbull High School community engages in an environment conducive to learning which believes that all students will **read and write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

Math Workshop II is designed for students who have an academic need identified through a variety of testing data. Students focus on organizational and algebraic support systems for CP Algebra II, in which they are enrolled concurrently.

This course supports students by identifying and filling in gaps in prerequisite knowledge necessary for students in CP Algebra II and beyond. It also helps to reinforce the topics of the CP Algebra II curriculum and reflect back upon topics previously learned throughout the year.

Students will be supported in their organizational skills as they relate to CP Algebra II, including, but not limited to, note-taking, study techniques, homework completion, and test preparedness.

COURSE GOALS

Supporting CP Algebra II, Math Workshop II takes a balanced instructional approach to promote the understanding of important mathematical concepts, skills, procedures, and ways of thinking and reasoning.

The following course goals derive from the 2010 Connecticut Core Standards for Mathematical Content.

N-RN   The Real Number System
Extend the properties of exponents to radical exponents. Use properties of rational and irrational numbers.

N-Q   Quantities
Reason quantitatively and use units to solve problems.

A-SSE   Seeing Structure in Expressions
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Interpret the structure of expressions. Write expressions in equivalent forms to solve problems.

A-APR   Arithmetic with Polynomials and Rational Expressions
Perform arithmetic operations on polynomials. Understand the relationship between zeros and factors of polynomials.

A-CED   Creating Equations
Create equations that describe numbers or relationships.

A-REI   Reasoning with Equations and Inequalities
Understand solving equations as a process of reasoning and explain the reasoning. Solve equations and inequalities in one variable. Solve systems of equations. Represent and solve equations and inequalities graphically.

F-IF   Interpreting Functions
Understand the concept of a function and use function notation. Interpret functions that arise in applications in terms of the context. Analyze functions using different representations.

F-BF   Building Functions
Build a function that models a relationship between two quantities. Build new functions from existing functions.

F-LE   Linear, Quadratic, and Exponential Models
Construct and compare linear, quadratic, and exponential models and solve problems. Interpret expressions for functions in terms of the situation they model.

S-ID   Interpreting Categorical and Quantitative Data
Summarize, represent, and interpret data on a single count or measurement variable. Summarize, represent, and interpret data on two categorical and quantitative variables. Interpret linear models.

S-IC   Making Inferences and Justifying Conclusions
Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

S-CP   Conditional Probability and the Rules of Probability
Understand independence and conditional probability and use them to interpret data.

The following course goals derive from the 2010 Connecticut Core Standards for Mathematical Practices, which describe varieties of expertise that all teachers of mathematics will develop in their students. These practices rest on important "processes and proficiencies" that have long been valued in mathematics education.

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1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved.

Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is.

4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.

Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry

software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and the tools' limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects.

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

The following standards derive from the 2016 International Society for Technology in Education Standards.

ISTE Digital Citizen (Standard 2)	Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.
	2a. Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
	2b. Students engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.
	2c. Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

	2d. Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.
ISTE Knowledge Constructor (Standard 3)	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.
	3a. Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
	3b. Students evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.
	3c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
	3d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

COURSE ENDURING UNDERSTANDINGS

Students will understand that . . .
- strong organizational and study skills enhance learning mathematics.
- number sense and order of operation give rise to solving algebraic equations.
- linear, exponential, quadratic and logarithmic equations can be used to model real-life situations, trigonometric functions, and make informed decisions.
- technology can help them analyze, organize, and display data to support their conclusions.

COURSE ESSENTIAL QUESTIONS

- How can I use strong organizational and study skills, and reflections on previous learning, to enhance learning mathematics?
- How can I use order of operation to solve algebraic equations?
- How does number sense help to assess derived answers in context of given problem?
- How can we take real-life data and model it mathematically?
- How can linear, exponential, quadratic and logarithmic equations help us make informed decisions about the world around us?
- How are trigonometric functions used in real-world applications?
- How can we use graphing calculators to translate real-life data into mathematical models?

COURSE KNOWLEDGE & SKILLS

Students will understand . . .
- the key vocabulary of algebraic mathematics:
  - place value and rounding rules, order of operations, solving multi-step equations including fractions, solving and graphing inequalities, relations of functions, domain and range, slope of lines, deriving and graphing linear equations, modeling real-world data using scatterplots, scatterplots on graphing calculator, solving and graphing systems of linear equations (Unit 1);
  - simplifying monomials expressions using the rules for exponents, adding and subtracting polynomials, factoring polynomials using GCF, grouping method, difference of squares, guess and check, sum and difference of cubes (Unit 2);
  - solving and graphing absolute value and square root equations, graphing special functions. (Unit 3)
  - operations with functions, inverse functions and relations, composite functions. (unit 4);
  - Dividing polynomial expressions, finding roots of real numbers and radical expressions. (unit 5)
  - operations with complex numbers, simplifying complex expressions, Solving quadratic equations by factoring, graphing, completing the square and Quadratic Formula. (Unit 6)
  - graphing quadratic equations by finding vertex and picking points and by putting equation into vertex form to graph, applying various methods to solve real-world applications of quadratic equations (Unit 7);
  - graph linear inequalities and systems of linear inequalities (Unit 8);
  - multiply and divide rational expressions and complex fractions, determine LCM, add and subtract rational expressions, solve rational equations, graph rational equations. (Unit 9);
  - find values of trigonometric functions for acute angles, solving real-world applications of trigonometric functions, change radians to degrees, degrees to radians, identify co-terminal angles in degrees and radians, find values of trigonometric functions for general angles, use reference angles (unit circle) to find values of trigonometric functions. (Unit 10)
  - graphing exponential functions, deriving equation for exponential function, solve exponential functions, evaluate logarithmic expressions, solve logarithmic equations, simplify and evaluate expressions using properties of logarithms, solve logarithmic equations using properties of logarithms, solve real-world applications of logarithmic and exponential problems (Unit 11)

Students will be able to . . .
- recognize place value for numbers and be able to round numbers properly using place value.
- Use order of operations to solve multi-step equations including those with fractions.
- Solve and graph one-variable inequalities.
- Identify domain and range of a function.
- write linear, quadratic, exponential and logarithmic equations from given information.

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- rewrite linear equations and inequalities for a given variable.
- use graphing functions of a graphing calculator.
- represent functions using tables, equations, and graphs.
- use function notation.
- find, analyze, and describe the meaning of slope.
- write linear equations.
- find the line of best fit, analyze trend lines, and make scatterplots.
- solve systems of equations by graphing, substitution, and elimination.
- solve systems of inequalities by graphing.
- learn the rules of exponents and use them to simplify expressions.
- learn to factor using GCF, difference of squares, sum and difference of cubes, grouping and guess and check.
- solve quadratic equations by factoring, completing the square and quadratic formula.
- identify the parameters of exponential functions and how they affect the graph of a function.
- apply exponential and logarithmic functions to real-world situations.
- add, subtract, multiply, divide and simplify radicals.
- solve radical equations and rationalize the denominator of radicals.
- add, subtract, and multiply and divide polynomials.
- factor polynomials.
- solve rational equations.
- graph rational equations.
- graph a parabola using the intercepts and vertex as well as vertex form.
- find the 6 trigonometric values from a right triangle.
- use right triangle trigonometry to solve real-world applications.
- convert from radians to degree, degrees to radians.
- identify circular angles.
- find co-terminal angles.
- use properties of logarithms to simplify and solve logarithmic equations.

COURSE SYLLABUS

Course Name
Math Workshop II

Level
College-Preparatory

Prerequisites
Concurrent enrollment in CP Algebra II

Materials Required
TI-84 graphing calculator

General Description of the Course
Math Workshop is designed to strengthen students' algebraic skills in preparation for success in Algebra II and future mathematics courses at Trumbull High School. Students will also strengthen and develop problem-solving strategies and organizational and study skills to enhance their mathematics practices.

Assured Assessments
Formative Assessments:
Formative assessments can include, but are not limited to:
- Diagnostic assessments
- Notebook checks
- Daily warm-ups
- Exit slips
- Classwork assignments

Summative Assessments:
- Practice tests
- Midterm review assessments
- Final review assessments

Core Text
Berchie HollidayEdD., et al. *Algebra 2*. New York: Glencoe Mathematics, 2003. Print.

UNIT 1
Introduction, Organization, CP Algebra II Unit 1 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:
- Complete a diagnostic assessment of foundational skills
- Learn organizational skills as they apply to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 1: Relations of Functions, Slope and Linear Equations

Unit Essential Questions

- How do I use the notes I've taken in class to prepare for an assessment?
- What are place values and how are they used to round numbers?
- How are fractions added, subtracted, multiplied and divided without a calculator?
- What is order of operations and how is it used to solve multi-step equations?
- How are inequalities solved and graphed?
- What is relations of functions?
- How is slope and linear equations be found?
- What methods can be used to solve a system of linear equations?
- How is the graphing calculator used to create scatter plots and model real world linear data?

Scope and Sequence

- Students will organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will use place values to round numbers correctly.
- Students will simplify expressions containing fractions.
- Students will apply the rules of order of operations to solve multi-step equations.
- Students will solve and graph inequalities with one variable.
- Students will write and graph linear equations.
- Students will solve systems of linear equations using different methods.
- Students will use their graphing calculator to create a scatter plot of data and derive a linear model of the data.

Assured Assessments

Formative Assessment:

Students will complete a diagnostic assessment to measure overall understanding of prerequisite skills. Students will then participate in tasks including, but not limited to, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

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Summative Assessment:
A summative practice test will be given in preparation for the Unit 1 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5

<u>Supplemental</u>

Time Allotment

- Approximately 35 days, with later reinforcement as needed

UNIT 2
Organization and Study Skills, CP Algebra II Unit 2 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Further develop organizational skills as they apply to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 2: Monomials, Polynomials and Factoring

Unit Essential Questions

- How can I build on my success from Unit 1 to better prepare for assessments?
- How do I factor quadratic functions and polynomials?
- How can I use the rules for exponents to multiply and divide monomials and polynomials?

Scope and Sequence

- Students will organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will factor, simplify and evaluate quadratic functions and polynomial expressions.

Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 2 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
Core
- Algebra 2 Glencoe Mathematics
- Sections 5.1, 5.2, 5.4

Time Allotment

- Approximately 8 days, with later reinforcement as need

UNIT 3
Organization and Study Skills, CP Algebra II Unit 3 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Further develop organizational skills and test-taking strategies as they apply to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 3: Solving and Graphing Absolute Value and Special Functions

Unit Essential Questions

- How can I build on my success from the previous units to better prepare for assessments?
- How are absolute value equations solved and graphed?
- How are special functions graphed?

Scope and Sequence

- Students will continue to organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will solve and graph absolute value equations.
- Students will graph special functions.

Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 3 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 1.4, 2.6, 9.5

Time Allotment

- Approximately 8 days, with later reinforcement as needed

UNIT 4

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Independent Study Skills, CP Algebra II Unit 4 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:
- Independently apply the previously learned skills and strategies to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 4: Operations with Functions

Unit Essential Questions

- How can I build on my success from the previous units to better prepare for assessments?
- What is a function?
- What are the different ways in which functions may be represented?
- How can functions be added, subtracted, multiplied and divided?
- What is an inverse function and relation?
- How are inverse functions found?
- What is a composite function?
- How is a composite function found?

Scope and Sequence

- Students will independently organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will be introduced to the concept of a function, identify relations and functions, and define the domain and range of a function.
- Students will be introduced to function notation and will perform operations on functions.
- Students will derive inverse functions.
- Students will derive composite functions from given functions.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:

A summative practice test will be given in preparation for the Unit 4 end-of-unit assessment in CP Algebra II.

Resources

Core
- Algebra 2 Glencoe Mathematics
- Sections 7.7, 7.8, 7.9

Time Allotment

- Approximately 15 days, with later reinforcement as needed

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UNIT 5
Semester 1 Review, CP Algebra II Unit 5 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 5: Dividing Polynomials, Roots of Real Numbers and Radical Expressions

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II to independently prepare for assessments including the CP Algebra II midterm examination?
- How do I divide a polynomial by a monomial?
- How do I divide polynomial expressions using long and synthetic division?
- How do I find the roots of real numbers with and without a calculator?
- How do I find the roots of radical expressions?

Scope and Sequence

- Following a midterm review, students will independently prepare for the CP Algebra II midterm examination using previously completed notes and study guides.
- Students will divide a polynomial by a monomial using their knowledge of factoring.
- Students will divide polynomials using long division.
- Students will divide polynomials using synthetic division.
- Students will find the roots of real numbers by using their calculator and by means of a factor tree.
- Student will simplify radical expressions.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:

A summative practice test will be given in preparation for the Unit 5 end-of-unit assessment in CP Algebra II. This, along with midterm review assessments, will count as 20% of the marking period grade.

Resources

Core
- Algebra 2 Glencoe Mathematics

- Sections 5.3, 5.5, 5.6

Time Allotment

- Approximately 8 days, with later reinforcement as needed

UNIT 6
Organizational and Study Skills, CP Algebra II Unit 6 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 6: Complex Numbers and Solving Quadratic Equations

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II?
- What is a complex number?
- How do I perform operations on complex numbers?
- What methods exist to solve quadratic equations?
- What is the quadratic formula and how does it work?
- How do I solve a quadratic equation using completing the square?

Scope and Sequence

- Students will add, subtract, multiply and divide complex numbers.
- Students will use their factoring skills from Unit 2 to factor and solve quadratic equations.
- Students will use the quadratic formula or completing the square to solve non-factorable quadratic equations.

Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 6 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 5.9, 6.3, 6.4, 6.5

Time Allotment

- Approximately 15 days, with later reinforcement as needed

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UNIT 7
Organization and Study Skills, CP Algebra II Unit 7 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 7: Graphing Quadratic Functions & Quadratic Real-World Applications.

Unit Essential Questions

- How can I make connections to material previously learned in ACP Algebra II?
- How do I find the axis of symmetry and vertex?
- How do I find the x and y-intercepts?
- How do I plot the axis of symmetry, vertex and intercepts?
- How do I use symmetry to complete the graph of a quadratic function?
- How do I use completing the square to put a quadratic equation into vertex form?
- How do I graph a quadratic equation in vertex form?
- What are the key phrases in quadratic word problems that will help me determine how to solve the problem?
- How do I decide if the answer I got makes sense in the context of the problem given?

Scope and Sequence

- Students will use $-\dfrac{b}{2a}$ and $f\left(-\dfrac{b}{2a}\right)$ to find the axis of symmetry, vertex, then plot them on the graph.
- Students will factor the quadratic equation and solve for the x-intercepts, then plot them on the graph.
- Students will find $f(0)$, the y-intercept, then plot that on the graph.
- Students will use symmetry to complete the graph of the quadratic equation.
- Students will apply information learned in Unit 2 to complete the square of a quadratic equation in order to put the equation into vertex form.
- Students will identify the vertex of a quadratic equation from the vertex form and graph the equation.
- Students will read the quadratic word problem, identify key words or phrases, write an equation from the given information; solve the equation to find the answer.
- Students will evaluate the solution to the quadratic word problem to be sure it make sense in the context of the given problem.

Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments
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related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 7 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
Core
- Algebra 2 Glencoe Mathematics
- Sections 6.2, 6.3, 6.6

Time Allotment

- Approximately 15 days, with later reinforcement as needed

UNIT 8
Independent Study Skills, CP Algebra II Unit 8 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 8: Graphing Linear Inequalities, Graphing Systems of Linear Inequalities, and Solving Radical Equations

Unit Essential Questions

- How do I graph a linear inequality?
- How do I graph a system of linear inequalities?
- Why do I have to shade the graph of linear inequalities?
- What does this shaded area represent?
- How do I solve a radical equation?
- What is an extraneous solution and why does it matter?

Scope and Sequence

- Students will review graphing of linear equations from Unit 1.
- Students will graph linear inequalities and systems of linear inequalities.
- Students will learn how to shade linear inequalities and why that shading is done.
- Students will evaluate radical equations.
- Students will check their solutions to radical equations to be sure the answers are not extraneous.

Assured Assessments
Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade. Summative Assessment:

A summative practice test will be given in preparation for the Unit 8 end-of-unit assessment in CP Algebra II. This, along with final review assessments, will count as 20% of the marking period grade.

Resources
Core
- Algebra 2 Glencoe Mathematics
- Sections 2.7, 3.3, 5.8

Time Allotment

- Approximately 8 days, with later reinforcement as needed

UNIT 9
Independent Study Skills, CP Algebra II Unit 9 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 9: Multiplying and Dividing Rational Expressions, Graphing Rational Expressions and Solving Rational Equations.

Unit Essential Questions

- How can I use everything I have learned in CP Algebra II to be successful on the final examination?
- How do I apply the rules of exponents from Unit 2 to help me multiply and divide rational expressions?
- How do I apply the factoring skills learned in Unit 2 to help me multiply and divide rational expressions?
- How do I solve a rational equation?
- Why is a common denominator needed to solve a rational equation?
- Why do I have to check the solution of a rational equation?

Scope and Sequence

- Students will review rules for exponents as well as factoring from Unit 2.
- Students will simplify multiplication and division of rational expressions.
- Students will solve rational equations and check their solutions.

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Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 9 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 9.1, 9.3, 9.6

Time Allotment

- Approximately 15 days, with later reinforcement as needed

UNIT 10
Semester 2 Review, CP Algebra II Unit 10 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 10: Right Triangle Trigonometry, Circular Angles and Measures, Trigonometric Functions of General Angles.

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II to independently prepare for assessments including the CP Algebra II final examination?
- How do I find values of trigonometric functions for acute angles?
- How do I solve problems involving right triangle?
- How do I solve real-world applications of right triangle trigonometry?
- What is a radian angle measure?
- How do I convert from degree to radians and visa-versa?
- What is a co-terminal angle and how do I find and draw them?
- How do I find values of trigonometric functions for general angles?
- What is a reference angle?
- How do I use reference angles to find values of trigonometric functions?

Scope and Sequence

- Following a final review, students will independently prepare for the CP Algebra II final examination using previously completed notes and study guides.
- Students will learn to evaluate the six trigonometric functions in terms of opposite, adjacent and hypotenuse.
- Students will learn to find sides and angles of right triangles using their calculator.
- Students will learn the ratios of special right triangles and how to apply these ratios.
- Students will read the trigonometric word problem, identify key words or phrases, write an equation from the given information; solve the equation to find the answer.
- Students will assess their solution to determine if it makes sense in the context of the given equation.
- Students will convert angle measures from degrees to radians and radians to degrees.
- Students will identify and draw co-terminal angles.
- Students will determine if co-terminal angles are positive or negative.
- Students will find values of trigonometric functions for general angles on the xy coordinate plane.
- Students will find the reference angle for a circular angle and use the reference angle to find the six trigonometry functions.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:

A summative practice test will be given in preparation for the Unit 10 end-of-unit assessment in CP Algebra II. This, will count as 20% of the marking period grade.

Resources

Core

- Algebra 2 Glencoe Mathematics
- Sections 13.1, 13.2, 13.3

Time Allotment

- Approximately 15 days, with later reinforcement as needed

Math Workshop II   23

UNIT 11
Semester 2 Review, CP Algebra II Unit 11 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 11: Exponential and Logarithmic Functions and Properties of Logarithms.

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II to independently prepare for assessments including the CP Algebra II final examination?
- What characterizes exponential growth and decay?
- What are real-world models of exponential growth and decay?
- How do I convert from logarithmic equations to exponential equations and visa-versa?
- Why is a common base needed to solve an exponential equation?
- Why are the rules for exponents (Unit 2) important for exponential equations?
- How do I evaluate a logarithmic expression?
- How do I solve a logarithmic equation?
- What are the properties of logarithms and why do I need them?
- How do I apply the properties of logarithms to solve more complex logarithmic equations?

Scope and Sequence

- Following a final review, students will independently prepare for the CP Algebra II final examination using previously completed notes and study guides.
- Students will graph exponential growth and decay models?
- Students will identify exponential growth and decay from a model and graph.
- Students will read and interpret real-world problems in order to write and solve exponential growth / decay applications.
- Student will convert exponential equations to logarithmic equations and logarithmic equations to exponential equations.
- Student will understand when to convert an equation for the purposes of solving.
- Students will solve logarithmic and exponential equations.
- Students will understand and apply the properties of logarithms to solve more complex logarithmic equations.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook

checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 11 end-of-unit assessment in CP Algebra II. This, along with a final exam review assessment will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 10.1, 10.2, 13.3

Time Allotment

- Approximately 10 days, with later reinforcement as needed

- Following a final review, students will independently prepare for the CP Algebra II final examination using previously completed notes and study guides.

COURSE CREDIT

One credit in Mathematics
One class period every other day for a full year?

PREREQUISITES

Concurrent enrollment in CP Algebra II

TEXT

- Algebra 2 Glencoe Mathematics

SUPPLEMENTARY MATERIALS/RESOURCES/TECHNOLOGY

Department- and teacher-prepared materials

TI-84 Plus graphing calculators

CURRENT REFERENCES

2010 Connecticut Core Standards for Mathematics
http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

ASSURED STUDENT PERFORMANCE RUBRICS

- Trumbull High School School-Wide Writing Rubric
- Trumbull High School School-Wide Problem-Solving Rubric
- Trumbull High School School-Wide Independent Learning and Thinking Rubric

SCHOOL-WIDE RUBRICS

Rubric 2: Write Effectively

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	• Establishes and maintains a clear purpose • Demonstrates an insightful understanding of audience and task	• Establishes and maintains a purpose • Demonstrates an accurate awareness of audience and task	• Establishes a purpose • Demonstrates an awareness of audience and task	• Does not establish a clear purpose • Demonstrates limited/no awareness of audience and task
Organization X_____	• Reflects sophisticated organization throughout • Demonstrates logical progression of ideas • Maintains a clear focus • Utilizes effective transitions	• Reflects organization throughout • Demonstrates logical progression of ideas • Maintains a focus • Utilizes transitions	• Reflects some organization throughout • Demonstrates logical progression of ideas at times • Maintains a vague focus • May utilize some ineffective transitions	• Reflects little/no organization • Lacks logical progression of ideas • Maintains little/no focus • Utilizes ineffective or no transitions
Content X_____	• Is accurate, explicit, and vivid • Exhibits ideas that are highly developed and enhanced by specific details and examples	• Is accurate and relevant • Exhibits ideas that are developed and supported by details and examples	• May contain some inaccuracies • Exhibits ideas that are partially supported by details and examples	• Is inaccurate and unclear • Exhibits limited/no ideas supported by specific details and examples
Use of Language X_____	• Demonstrates excellent use of language • Demonstrates a highly effective use of standard writing that enhances communication • Contains few or no errors. Errors do not detract from meaning	• Demonstrates competent use of language • Demonstrates effective use of standard writing conventions • Contains few errors. Most errors do not detract from meaning	• Demonstrates use of language • Demonstrates use of standard writing conventions • Contains errors that detract from meaning	• Demonstrates limited competency in use of language • Demonstrates limited use of standard writing conventions • Contains errors that make it difficult to determine meaning

Rubric 3: Problem Solving through Critical Thinking

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	Student demonstrates clear understanding of the problem and the complexities of the task	Student demonstrates sufficient understanding of the problem and most of the complexities of the task	Student demonstrates some understanding of the problem but requires assistance to complete the task	Student demonstrates limited or no understanding of the fundamental problem after assistance with the task
Research X_____	Student gathers compelling information from multiple sources including digital, print, and interpersonal	Student gathers sufficient information from multiple sources including digital, print, and interpersonal	Student gathers some information from few sources including digital, print, and interpersonal	Student gathers limited or no information
Reasoning and Strategies X_____	Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies	Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies	Student demonstrates some critical thinking skills to develop a plan integrating some strategies	Student demonstrates limited or no critical thinking skills and no plan
Final Product and/or Presentation X_____	Solution shows deep understanding of the problem and its components. Solution shows extensive use of 21st Century Technology Skills.	Solution shows sufficient understanding of the problem and its components. Solution shows sufficient use of 21st Century Technology Skills.	Solution shows some understanding of the problem and its components. Solution shows some use of 21st Century Technology Skills.	Solution shows limited or no understanding of the problem and its components. Solution shows limited or no use of 21st Century Technology Skills.

Rubric 5: Independent Learners And Thinkers

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work.	Student demonstrates initiative by generating appropriate questions, creating original projects/work.	Student demonstrates some initiative by generating questions, creating appropriate projects/work.	Student demonstrates limited or no initiative by generating few questions and creating projects/work.
Independent Research & Development X_____	Student is analytical, insightful, and works independently to reach a solution.	Student is analytical, and works productively to reach a solution.	Student reaches a solution with direction.	Student is unable to reach a solution without consistent assistance.
Presentation of Finished Product X_____	Presentation shows compelling evidence of an independent learner and thinker. Solution shows deep understanding of the problem and its components. Solution shows extensive and appropriate application of 21st Century Skills.	Presentation shows clear evidence of an independent learner and thinker. Solution shows adequate understanding of the problem and its components. Solution shows adequate application of 21st Century Skills.	Presentation shows some evidence of an independent learner and thinker. Solution shows some understanding of the problem and its components. Solution shows some application of 21st Century Skills.	Presentation shows limited or no evidence of an independent learner and thinker. Solution shows limited or no understanding of the problem. Solution shows limited or no application of 21st Century Skills.

TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

ACP AND CP INTRODUCTION TO COLLEGE MATHEMATICS
Grades 11-12
Mathematics Department
2021

Curriculum Writing Team

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Susan Iwanicki, Ed.D   **Assistant Superintendent**

ACP and CP Introduction to College Mathematics
Table of Contents

CORE VALUES AND BELIEFS

The Trumbull High School community engages in an environment conducive to learning which believes that all students will **read** and **write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

The primary goal of College Mathematics is to have students develop mathematical proficiency in order to solve real-world problems. The students will build upon previous mathematical knowledge learned in Algebra II and apply these skills in future situations. College mathematics provides an alternative senior mathematics course for students who do not intend to study calculus in college. This course reinforces necessary math skills and introduces new topics to prepare them adequately not only for college, but for real-world situations.

Topics covered in this course include: algebra, graphs and functions, systems of equations and inequalities, sets, sequences and series, and probability. Each of these topics will

be explored and students will be applying skills learned in these units to solve problems involving real-world data.

College Mathematics is designed to preview and prepare students for a standard non-calculus first-year college math course. Students will receive further instruction in previously studied Algebra II topics while also gaining an introduction to new topics such as sets, sequences and series, and probability. Students will be given instruction in reading and writing the notation, as well as vocabulary, associated with the various topics. Particular attention will be given to the understanding of the processes involved and the students' ability to communicate these procedures both orally and in written form.

COURSE GOALS

The following Course Goals derive from the 2010 Connecticut Core Standards for Mathematical Practice, which describe varieties of expertise that all teachers of mathematics will develop in their students. These practices rest on important "processes and proficiencies" that have long been valued in mathematics education.

At the completion of this course, students will:

1. Make sense of problems and persevere in solving them.
Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.

2. Reason abstractly and quantitatively.
Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize – to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents – and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects

3. Construct viable arguments and critique the reasoning of others.
Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples.

They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and – if there is a flaw in an argument – explain what it is.

4. Model with mathematics.
Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and the tools' limitations.

6. Attend to precision.
Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context.

7. Look for and make use of structure.
Mathematically proficient students look closely to discern a pattern or structure. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects.

8. Look for and express regularity in repeated reasoning.
Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

The following Course Goals derive from the 2016 International Society for Technology in Education Standards.

Standard 5: Computational Thinker
Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

5b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision making.
5c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem solving.

COURSE ENDURING UNDERSTANDINGS

Students will understand that...
- Algebra can be useful in solving everyday problems
- Systems of equations can be used to determine cost-effectiveness
- Putting elements into sets helps order and arrange the world
- Probability can be applied to help us make informed decisions in our lives

COURSE ESSENTIAL QUESTIONS

- How can we use Algebra concepts in everyday life?
- How can organizing and analyzing information be useful in our understanding of the world and the decisions we make?

COURSE KNOWLEDGE & SKILLS

Students will know…
- Basic algebraic vocabulary
- The order of operations
- How to solve and apply linear, quadratic, and exponential equations
- The process of graphing equations and functions
- The variety of methods used in solving systems of linear equations
- Methods to indicate sets, equal sets, and equivalent sets
- The meaning and differences between empirical, theoretical, compound, conditional, and binomial probability

Students will be able to…
- Solve linear and quadratic equations in one variable
- Evaluate a formula
- Solve application problems dealing with variation

- Solve systems of linear inequalities
- Solve application problems using linear programming
- Perform set operations such as complement, intersection, union, difference, and Cartesian product
- Apply Venn diagrams to represent data and solve problems
- Calculate odds against and event and odds in favor of an event
- Apply expected value to real life situations
- Calculate probabilities of events using tree diagrams
- Determine outcomes and probabilities of an event occurring using counting principle, permutations, and combinations

COURSE SYLLABUS

Course Name: Introduction to College Mathematics

Course Level: College Preparatory/Advanced College Preparatory

Prerequisites:
Students enrolled in Introduction to College Math should have successfully completed Advanced College Preparatory Algebra II with a B+ or better or College Preparatory Algebra II with a teacher recommendation.

General Description of Course Content:
Introduction to College Math is a course designed for students who have completed Algebra II and are not planning to take calculus in college. It is designed as preparation for the first year of non-calculus college math courses. Students will learn about the following topics: algebra, graphs, functions, systems of equations and inequalities, sets, and probability. Real world applications and connections between topics are stressed. This class is intended for students who have not taken PreCalculus.

Assessment:
Students are evaluated by their performance on classroom problem sets, journal tasks, tests,quizzes, projects, and departmental midyear and final exams.

Text and Supplementary Materials:
1. A Survey of Mathematics with Applications, Pearson Education, Inc., by Angel, Abbott, and Runde, 2009.
2. TI-84 plus calculators
3. Microsoft Word, Excel

UNIT 1
Algebra, Graphs, and Functions

Unit Goal
At the completion of this unit students will be able to:

The following Unit Goals align with the 2010 Connecticut Core Standards for Mathematics.
A-CED   **Creating Equations**
Create equations that describe numbers or relationships
1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
 2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
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. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R.

A-REI Reasoning with Equations and Inequalities
Understand solving equations as a process of reasoning and explain the reasoning
1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
Solve equations and inequalities in one variable
4. Solve quadratic equations in one variable.
b. Solve quadratic equations by inspection (e.g., for $x2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.

Unit Essential Questions
How do we use the language of algebra to solve real-world problems?

Focus Questions:
   1. How do we visually represent real-world problems?

2. How can we use quadratic equations to answer questions?
3. What are the differences between equations and inequalities?

Scope and Sequence

1. Order of Operations
2. Solving Linear Equations and Ratios
3. Using Formulas to solve for different variables
4. Writing Linear Equations to solve real-world applications
5. Using Direct, Inverse and Joint Variation to solve word problems
6. Solving and Graphing Linear Inequalities and Compound inequalities
7. Using graphs of Linear Equations to solve real-world examples
8. Solving Quadratic Equations using Factoring and the Quadratic Formula
9. Functions and their Graphs

Assured Assessments
Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources
Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde
Supplement- Khan Academy
Time Allotment
25 days

Unit 2
Systems of Linear Equations and Inequalities

Unit Goal
At the completion of this unit students will be able to:
The following Unit Goals align with the 2010 Connecticut Core Standards for Mathematics.
A-REI Reasoning with Equations and Inequalities

Solve systems of equations
 5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Represent and solve equations and inequalities graphically

10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). 11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★

12. Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Unit Essential Questions

What is the importance of the intersection of two lines?

Focus Questions:
1. How is a situation represented with a system of equations?
2. What does the solution of a system of two linear equations represent?
3. How do systems of linear functions model real-world data?
4. How is the solution to a system of linear inequalities represented?
5. What is the connection between the feasible region and the solution in linear programming? (ACP only)

Scope and Sequence
1. Solve systems of linear equations by graphing.
2. Solve systems of linear equations by substitution and elimination.
3. Solve systems of linear inequalities by graphing.
4. Use linear programming to determine a feasible region by graphing
5. Use linear programming to write a system and then solve a real-world problem by finding the minimum cost or maximum profit.

Assured Assessments

Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources

Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde
Supplement- Khan Academy
Multiple websites that offer Linear programming problems with solutions.
TI-84 Graphing calculator
Teacher resource package

Time Allotment
20 days

Unit 3
Sets

Unit Goal
At the completion of this unit students will be able to:
1. Determine the difference between sets, equal sets, equivalent sets and subsets.
2. Construct Venn diagrams given different sets of data.
3. Use set operations such as complement, intersection, union and the difference of two sets.
4. Solve real world applications using Venn diagrams.

Unit Essential Questions
How are sets used to sort and classify?

Focus Questions:
1. What is the difference between union and intersection?
2. What is the empty set and universal set?
3. What is the complement of a set?
4. What is a subset and proper subset?
5. How is the union and intersection represented symbolically?
6. How does a Venn diagram represent data?
7. How do Venn diagrams solve set logic problems?

Scope and Sequence
1. Set notation and vocabulary.
2. Elements of a set
3. Determine subsets and proper subsets from a Universal set
4. Null set/empty set
5. Complement of a set
6. Find the intersection, union and difference between sets
7. Use Venn diagrams to solve set logic problems
8. Apply sets to sort and classify data to solve real-world problems

Assured Assessments
Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources
Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by
Allen R. Angel, Christine D. Abbot, Dennis C. Runde
TI-84 Graphing calculator
Teacher resource package

Time Allotment
20 day

UNIT 4
Probability

Unit Goal
At the completion of this unit students will be able to:

The following Unit Goals align with the 2010 Connecticut Core Standards for Mathematics.
Conditional Probability and the Rules of Probability

S-CP Conditional Probability and the rules of Probabilty

Understand independence and conditional probability and use them to interpret data
1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
 2.Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
 3. Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.
Use the rules of probability to compute probabilities of compound events in a uniform probability model.
6. Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.
 7. Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.
8. Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model.
9. Use permutations and combinations to compute probabilities of compound events and solve problems.

S-MD Using Probability to Make Decisions

2. Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.

3. Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.

5. Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.

> a. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fastfood restaurant.

6. Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).

Unit Essential Questions

How does probability help to explain the world around us?

Focus Questions:
1. What is the difference between empirical and theoretical probability?
2. How is probability determined?
3. What is an equally likely outcome?
4. What is the difference between odds and probability?
5. What is the relationship between odds against and odds in favor?
6. How is probability used to determine expected value?
7. How is an "or" probability problem calculated?
8. How is an "and" probability problem calculated?
9. What makes two events independent?

Scope and Sequence
1. Calculate and distinguish between empirical and theoretical probability.
2. Define equally likely outcomes and determine the probability of simple events.
3. Determine the odds of an event in favor or against.
4. Calculate the expected value of an event.
5. Use Tree diagrams to calculate probabilities of events occurring.
6. Apply formulas for "or" and "and" probabilities.
7. Determine probability given a certain event has already occurred.
8. Use Combinations and Permutations to determine the number of possible outcomes.
9. Determining the probability of an event occurring using Combinations.

Assured Assessments

Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources

Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde
TI-84 Graphing calculator
Teacher resource package

Time Allotment
25 days

COURSE CREDIT

One-half credit in Mathematics
One class period daily for a half a year

PREREQUISITES

Successful completion of ACP Algebra II of Honors Algebra II, or a B+ or higher in CP Algebra II with teacher recommendation

TEXT

A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde

SUPPLEMENTARY MATERIALS/RESOURCES/TECHNOLOGY

Department and teacher prepared materials

TI-84 Plus graphing calculators

CURRENT REFERENCES

2010 Connecticut Core Standards for Mathematics

http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

ASSURED STUDENT PERFORMANCE RUBRICS

Rubric 2: Write Effectively

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	• Establishes and maintains a clear purpose • Demonstrates an insightful understanding of audience and task	• Establishes and maintains a purpose • Demonstrates an accurate awareness of audience and task	• Establishes a purpose • Demonstrates an awareness of audience and task	• Does not establish a clear purpose • Demonstrates limited/no awareness of audience and task
Organization X_____	• Reflects sophisticated organization throughout • Demonstrates logical progression of ideas • Maintains a clear focus • Utilizes effective transitions	• Reflects organization throughout • Demonstrates logical progression of ideas • Maintains a focus • Utilizes transitions	• Reflects some organization throughout • Demonstrates logical progression of ideas at times • Maintains a vague focus • May utilize some ineffective transitions	• Reflects little/no organization • Lacks logical progression of ideas • Maintains little/no focus • Utilizes ineffective or no transitions
Content X_____	• Is accurate, explicit, and vivid • Exhibits ideas that are highly developed and enhanced by specific details and examples	• Is accurate and relevant • Exhibits ideas that are developed and supported by details and examples	• May contain some inaccuracies • Exhibits ideas that are partially supported by details and examples	• Is inaccurate and unclear • Exhibits limited/no ideas supported by specific details and examples
Use of Language X_____	• Demonstrates excellent use of language • Demonstrates a highly effective use of standard writing that enhances communication • Contains few or no errors. Errors do not detract from meaning	• Demonstrates competent use of language • Demonstrates effective use of standard writing conventions • Contains few errors. Most errors do not detract from meaning	• Demonstrates use of language • Demonstrates use of standard writing conventions • Contains errors that detract from meaning	• Demonstrates limited competency in use of language • Demonstrates limited use of standard writing conventions • Contains errors that make it difficult to determine meaning

Rubric 3: Problem Solving through Critical Thinking

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	Student demonstrates clear understanding of the problem and the complexities of the task	Student demonstrates sufficient understanding of the problem and most of the complexities of the task	Student demonstrates some understanding of the problem but requires assistance to complete the task	Student demonstrates limited or no understanding of the fundamental problem after assistance with the task
Research X_____	Student gathers compelling information from multiple sources including digital, print, and interpersonal	Student gathers sufficient information from multiple sources including digital, print, and interpersonal	Student gathers some information from few sources including digital, print, and interpersonal	Student gathers limited or no information
Reasoning and Strategies X_____	Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies	Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies	Student demonstrates some critical thinking skills to develop a plan integrating some strategies	Student demonstrates limited or no critical thinking skills and no plan
Final Product and/or Presentation X_____	Solution shows deep understanding of the problem and its components. Solution shows extensive use of 21st Century Technology Skills.	Solution shows sufficient understanding of the problem and its components. Solution shows sufficient use of 21st Century Technology Skills.	Solution shows some understanding of the problem and its components. Solution shows some use of 21st Century Technology Skills.	Solution shows limited or no understanding of the problem and its components. Solution shows limited or no use of 21st Century Technology Skills.

Rubric 5: Independent Learners And Thinkers

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work.	Student demonstrates initiative by generating appropriate questions, creating original projects/work.	Student demonstrates some initiative by generating questions, creating appropriate projects/work.	Student demonstrates limited or no initiative by generating few questions and creating projects/work.
Independent Research & Development X_____	Student is analytical, insightful, and works independently to reach a solution.	Student is analytical, and works productively to reach a solution.	Student reaches a solution with direction.	Student is unable to reach a solution without consistent assistance.
Presentation of Finished Product X_____	Presentation shows compelling evidence of an independent learner and thinker. Solution shows deep understanding of the problem and its components. Solution shows extensive and appropriate application of 21st Century Skills.	Presentation shows clear evidence of an independent learner and thinker. Solution shows adequate understanding of the problem and its components. Solution shows adequate application of 21st Century Skills.	Presentation shows some evidence of an independent learner and thinker. Solution shows some understanding of the problem and its components. Solution shows some application of 21st Century Skills.	Presentation shows limited or no evidence of an independent learner and thinker. Solution shows limited or no understanding of the problem. Solution shows limited or no application of 21st Century Skills.

TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

Practical Applications in Mathematics
Grades 11-12
Mathematics Department
2021

Curriculum Writing Team

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Practical Application in Mathematics
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The Trumbull Board of Education will continue to take Affirmative Action to ensure that no persons are discriminated against in its employment.

CORE VALUES AND BELIEFS

The Trumbull High School community engages in an environment conducive to learning which believes that all students will **read** and **write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

The primary goal of Practical Applications in Mathematics is to have students apply mathematical concepts to solve real-world problems. The students will build upon previous mathematical knowledge learned in Algebra II and apply these skills in future situations such as car loans, installment buying,mortgages, and statistics. Practical Applications in Mathematics provides an alternative senior mathematics course for students who do not intend to study calculus in college. This course reinforces necessary math skills and introduces new topics to prepare them adequately not only for college, but for real-world situations.

Topics covered in this course include: personal loans, simple and compound interest, installment buying, investing in annuities, mortgages, and statistics. Each of these topics will be explored and students will be applying skills learned in these units to solve problems involving real-world data.

Practical Applications in Mathematics is designed to prepare students with an understanding of complex mathematics they will inevitably deal with in everyday life. Students will be given instruction in reading and writing the notation, as well as vocabulary, associated with the various topics. Particular attention will be given to the understanding of the processes involved and the students' ability to communicate these procedures both orally and in written form.

COURSE GOALS

The following Course Goals derive from the 2010 Connecticut Core Standards for Mathematical Practice, which describe varieties of expertise that all teachers of mathematics will develop in their students. These practices rest on important "processes and proficiencies" that have long been valued in mathematics education.

At the completion of this course, students will:

 1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.

2. Reason abstractly and quantitatively.
Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize – to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents – and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects

3. Construct viable arguments and critique the reasoning of others.
Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and – if there is a flaw in an argument – explain what it is.

4. Model with mathematics.
Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or

course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and the tools' limitations.

6. Attend to precision.
Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context.

7. Look for and make use of structure.
Mathematically proficient students look closely to discern a pattern or structure. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects.

8. Look for and express regularity in repeated reasoning.
Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

The following Course Goals derive from the 2016 International Society for Technology in Education Standards.

Standard 5: Computational Thinker
Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

     5b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision making.
     5c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem solving.

COURSE ENDURING UNDERSTANDINGS
Students will understand that...
- Paying for something with a loan has an added cost
- Interest can help in investing toward long-term goals
- There are financial obligations to consider prior to and after obtaining a home loan
- Statistics can be valuable, but also misinterpreted

COURSE ESSENTIAL QUESTIONS
- How can calculating interest help in planning for the future?
- How can statistics help inform the decisions we make?

COURSE KNOWLEDGE & SKILLS

Students will know…
- The difference between simple and compound interest
- That buying with a loan changes the total cost
- The costs involved in purchasing a home
- The breakdown of monthly loan payments to principal and interest
- The methods of sampling in statistics
- How to utilize graphs and central tendency in statistics

Students will be able to…
- Calculate simple and compound interest
- Calculate percentage yield and present value
- Determine the finance charge of an installment loan
- Compare total cost using different methods for calculating finance charge
- Calculate monthly payments to principal and interest
- Calculate the total interest paid on a mortgage
- Determine if a sample is biased and if statistics are being misused
- Construct a variety of graphs to display statistical data

COURSE SYLLABUS

Course Name: Practical Applications in Mathematics

Course Level: College Preparatory/Advanced College Preparatory

Prerequisites:
Students enrolled in Practical Applications in Mathematics should have successfully completed Advanced College Preparatory Algebra II with a B+or better or College Preparatory Algebra II with a teacher recommendation.

General Description of Course Content:
Practical Applications in Mathematics is a course designed for students who have completed Algebra II and are not planning to take calculus in college. It is designed as preparation for the first year of non-calculus college math courses. Students will learn about the following topics: personal loans, simple and compound interest, installment buying, mortgages, and statistics. Real world applications and connections between topics are stressed. This class is intended for students who have not taken PreCalculus.

Assessment:
Students are evaluated by their performance on classroom problem sets, journal tasks, tests, quizzes, projects, and departmental midyear and final exams.

Text and Supplementary Materials:
1. A Survey of Mathematics with Applications, Pearson Education, Inc., by Angel, Abbott, and Runde, 2009.
2. TI-84 plus calculators
3. Microsoft Word, Excel

UNIT 1
Personal Loans, Simple and Compound Interest

Unit Goals

At the completion of this unit, students will:
1. Be able to calculate real world percent problems.
2. Calculate the simple interest on a personal loan and the cost of obtaining a personal loan.
3. Determine the difference between simple and compound interest.
4. Calculate compound interest and show how it can be used to help with investing for some long-term goals.

Unit Essential Questions
How can mathematical analysis help while making important financial decisions?

Focus Questions:
1. How is percent change calculated?
2. How is percent markup used in solving real world problems?
3. How is the simple interest formula calculated?
4. How is the simple interest formula used to solve problems?
5. What is the difference between simple and compound interest?
6. What is the Annual Percentage Yield?
7. What is the present value and how it is calculated?
8. How is the compound interest formula used to solve real world problems?

Scope and Sequence

1. Calculate simple interest
2. Solve problems using the concept of percent change
3. Calculate the percent markup within a real world problem
4. Define the vocabulary used with respect to simple and compound interest
5. Calculate compound interest
6. Determine the annual percentage yield
7. Calculate present value

Assured Assessments
Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources
 Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde
TI-84 Graphing calculator
Teacher resource package

Time Allotment

- Approximately 10 days

Unit 2
Installment Buying, Ordinary Annuities and Retirement Investing

Unit Goals

At the completion of this unit, students will:

1. Be able to calculate the finance charge on an installment loan.
2. Be able to determine the Annual Percentage Rate given they know the monthly payment.
3. Be able to calculate the savings on the finance charge if the loan is paid off early.
4. Calculate the monthly payment on a credit card using either the unpaid balance method or the average daily balance method.
5. Calculate the amount of money saved over a period of time by investing in an Ordinary Annuity or a Sinking fund.

Unit Essential Questions
What is the actual cost of a loan?

Focus Questions:
1. How does the interest rate affect the true cost of the loan?
2. What is the actual price of an item bought on an installment plan?
3. What is the annual percentage rate (APR)?
4. What is a finance charge and how is it calculated?

5. What are the two methods used to determine the finance charge and how do they differ?
6. What is an open-end installment loan?
7. What is the unpaid balance method for calculating finance charge?
8. What is the average daily balance method for calculating a finance charge?
9. How can the understanding of installment help in the real world?
10. What is the difference between an ordinary annuity and a sinking fund?
11. Why does saving money on a regular basis lead to a comfortable retirement?

Scope and Sequence
1. Determine the finance charge on installment buying using a variety of methods and conditions.
2. Use the vocabulary associated with installment buying.
3. Understand how the down payment affects the total cost of the loan.
4. Use different methods to calculate the finance charge on open installment loans.
5. Use the Actuarial method to find the unearned interest when a loan is paid off early.
6. Use the two methods of saving for retirement by investing in an Ordinary Annuity and a Sink Fund.

Assured Assessments
Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources
 Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde
TI-84 Graphing calculator
Teacher resource package

Time Allotment

15 days

Unit 3
Mortgages

Unit goals

At the completion of this unit, students will:
1. Understand how to qualify for a mortgage and read a credit report.
2. Calculate the monthly payment of a conventional mortgage or a variable mortgage.
3. Create a budget for all the expenses of owning a home and all the expenses that go along with it.
4. Buy a house (virtually).

Unit Essential Questions

How much money are you really paying for that house?

Focus Questions:
1. How does the amount of a down payment affect the total cost of the mortgage?
2. What is the difference between an adjustable rate loan and a conventional loan?
3. What are points?
4. How do points affect the total cost of the amount mortgaged?
5. What is the adjusted monthly income?
6. How do I calculate my take home pay?
7. How does the bank determine if you qualify for a loan?
8. How much of your monthly mortgage payment goes to interest versus principal?
9. What is the process of buying a house?
10. How do I calculate a monthly budget with my take home pay?

Scope and Sequence

1. Use vocabulary associated with mortgages.
2. Know the difference between conventional loans and adjustable rate loans.
3. Read a credit report and understand what the number means.
4. Determine how to qualify for a mortgage.
5. Calculate the monthly payment on a mortgage.
6. Calculate the total cost of a house after the mortgage is paid off.
7. Determine the amount of principal and interest on the first payment of a mortgage.
8. Home Buying Project. (See Supplement)

Assured Assessments

Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources

Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde
TI-84 Graphing calculator
Teacher resource package

Supplement

The Home Buying Project is in the common drive under the Mathematics folder.

Time Allotment

18 days

Unit 4
Statistics

Unit Goals
The following Unit Goals align with the 2010 Connecticut Core Standards for Mathematics.

At the completion of this unit, students will:
Understand and evaluate random processes underlying statistical experiments
CCSS.MATH.CONTENT.HSS.IC.A.1
Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
CCSS.MATH.CONTENT.HSS.IC.A.2
Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.
Make inferences and justify conclusions from sample surveys, experiments, and observational studies
CCSS.MATH.CONTENT.HSS.IC.B.3
Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
CCSS.MATH.CONTENT.HSS.IC.B.4
Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
CCSS.MATH.CONTENT.HSS.IC.B.6
Evaluate reports based on data.
Summarize, represent, and interpret data on a single count or measurement variable
CCSS.MATH.CONTENT.HSS.ID.A.1
Represent data with plots on the real number line (histograms, and box plots).
CCSS.MATH.CONTENT.HSS.ID.A.2
Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
CCSS.MATH.CONTENT.HSS.ID.A.3

Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
CCSS.MATH.CONTENT.HSS.ID.A.4
Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

Unit Essential Questions
How are statistics used to make informed decisions?

Focus questions:
1. What are the methods of sampling?
2. How can the misuses of statistics be identified?
3. What is a frequency distribution?
4. What are the upper class and lower class limits?
5. How is the class width calculated?
6. What are the different statistical graphs?
7. How are the measures of central tendency calculated?
8. What are percentiles and quartiles?
9. What are measures of dispersion?
10. How do you find the percent of data that falls below a particular piece of data in the set of data?

Scope and Sequence

1. Distinguish between the different methods of sampling.
2. Explore the misuses of statistics.
3. Construct a frequency distribution.
4. Determine the class width and class limits of a set of data.
5. Construct a histogram, circle graph, frequency polygon and a stem and leaf display.
6. Calculate the measures of central tendency and which measure best represents the data being studied.
7. Find the percentiles and quartiles.
8. Calculate the standard deviation.
9. Find the percent of data that falls underneath the normal curve.

Assured Assessments
Homework, Classwork Problem Sets, Quizzes, and a Unit Test.

Resources
Core- Textbook: A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde
TI-84 Graphing calculator
Teacher resource package

Supplement

Create a survey, pick a sampling plan, use excel to create a frequency distribution and a circle graph.

Time Allotment
40 days

COURSE CREDIT
One-half credit in Mathematics

One class period daily for a half a year

PREREQUISITES
Successful completion of ACP Algebra II of Honors Algebra II, or a B+ or higher in CP Algebra II with teacher recommendation

TEXT
A Survey of Mathematics with Applications, Pearson Addison Wesley, by Allen R. Angel, Christine D. Abbot, Dennis C. Runde

SUPPLEMENTARY MATERIALS/RESOURCES/TECHNOLOGY
Department and teacher prepared materials
TI-84 Plus graphing calculators

CURRENT REFERENCES
2010 Connecticut Core Standards for Mathematics

http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

ASSURED STUDENT PERFORMANCE RUBRICS (see pages 14-16)

Rubric 2: Write Effectively

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	• Establishes and maintains a clear purpose • Demonstrates an insightful understanding of audience and task	• Establishes and maintains a purpose • Demonstrates an accurate awareness of audience and task	• Establishes a purpose • Demonstrates an awareness of audience and task	• Does not establish a clear purpose • Demonstrates limited/no awareness of audience and task
Organization X_____	• Reflects sophisticated organization throughout • Demonstrates logical progression of ideas • Maintains a clear focus • Utilizes effective transitions	• Reflects organization throughout • Demonstrates logical progression of ideas • Maintains a focus • Utilizes transitions	• Reflects some organization throughout • Demonstrates logical progression of ideas at times • Maintains a vague focus • May utilize some ineffective transitions	• Reflects little/no organization • Lacks logical progression of ideas • Maintains little/no focus • Utilizes ineffective or no transitions
Content X_____	• Is accurate, explicit, and vivid • Exhibits ideas that are highly developed and enhanced by specific details and examples	• Is accurate and relevant • Exhibits ideas that are developed and supported by details and examples	• May contain some inaccuracies • Exhibits ideas that are partially supported by details and examples	• Is inaccurate and unclear • Exhibits limited/no ideas supported by specific details and examples
Use of Language X_____	• Demonstrates excellent use of language • Demonstrates a highly effective use of standard writing that enhances communication • Contains few or no errors. Errors do not detract from meaning	• Demonstrates competent use of language • Demonstrates effective use of standard writing conventions • Contains few errors. Most errors do not detract from meaning	• Demonstrates use of language • Demonstrates use of standard writing conventions • Contains errors that detract from meaning	• Demonstrates limited competency in use of language • Demonstrates limited use of standard writing conventions • Contains errors that make it difficult to determine meaning

Rubric 3: Problem Solving through Critical Thinking

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	Student demonstrates clear understanding of the problem and the complexities of the task	Student demonstrates sufficient understanding of the problem and most of the complexities of the task	Student demonstrates some understanding of the problem but requires assistance to complete the task	Student demonstrates limited or no understanding of the fundamental problem after assistance with the task
Research X_____	Student gathers compelling information from multiple sources including digital, print, and interpersonal	Student gathers sufficient information from multiple sources including digital, print, and interpersonal	Student gathers some information from few sources including digital, print, and interpersonal	Student gathers limited or no information
Reasoning and Strategies X_____	Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies	Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies	Student demonstrates some critical thinking skills to develop a plan integrating some strategies	Student demonstrates limited or no critical thinking skills and no plan
Final Product and/or Presentation X_____	Solution shows deep understanding of the problem and its components. Solution shows extensive use of 21st Century Technology Skills.	Solution shows sufficient understanding of the problem and its components. Solution shows sufficient use of 21st Century Technology Skills.	Solution shows some understanding of the problem and its components. Solution shows some use of 21st Century Technology Skills.	Solution shows limited or no understanding of the problem and its components. Solution shows limited or no use of 21st Century Technology Skills.

Rubric 5: Independent Learners And Thinkers

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work.	Student demonstrates initiative by generating appropriate questions, creating original projects/work.	Student demonstrates some initiative by generating questions, creating appropriate projects/work.	Student demonstrates limited or no initiative by generating few questions and creating projects/work.
Independent Research & Development X_____	Student is analytical, insightful, and works independently to reach a solution.	Student is analytical, and works productively to reach a solution.	Student reaches a solution with direction.	Student is unable to reach a solution without consistent assistance.
Presentation of Finished Product X_____	Presentation shows compelling evidence of an independent learner and thinker. Solution shows deep understanding of the problem and its components. Solution shows extensive and appropriate application of 21st Century Skills.	Presentation shows clear evidence of an independent learner and thinker. Solution shows adequate understanding of the problem and its components. Solution shows adequate application of 21st Century Skills.	Presentation shows some evidence of an independent learner and thinker. Solution shows some understanding of the problem and its components. Solution shows some application of 21st Century Skills.	Presentation shows limited or no evidence of an independent learner and thinker. Solution shows limited or no understanding of the problem. Solution shows limited or no application of 21st Century Skills.