

TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

Drafting and Design
Grade 9-12

2024

(Last revision date: 1993)

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Drafting and Design

Grade 9-12

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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

Drafting and Design introduces students to the way software is used in engineering and design to solve real world problems and create products. Students will start by learning the basics with pencil and paper mechanical drawing and will move on to 2-D CADD finally moving to 3-D CADD and 3-D printing.

COURSE GOALS

WM.04.05	Describe and identify fractional measurements from a basic plan and assembly drawings.
WM.04.08	Measure accurately to a sixteenth of an inch.
CADD.02	Analyze the use of current CADD design technology.
CADD.02.01	Apply conventional Computer Aided Drafting and Design process and procedures accurately, appropriately and safely.
CADD.02.04	Describe and demonstrate the use of graphic communication skills through sketching
CADD.02.05	Evaluate and select appropriate method of communication for a given problem.
CADD.02.07	Express a design of an object as a 3-D model
CADD.02.08	Export and import images/files in a variety of file formats
CADD.02.09	Evaluate the choice and placement of dimensions, notes and annotations to clearly communicate design intent.

CADD.02.11	Identify basic geometric elements (e.g., lines, circle, rectangle, sphere, and cube.)
CADD.03	Utilize measurement and annotation systems as they apply to CADD technology design.
CADD.03.01	Explain how the various measurement systems are used in CADD drawings.
CADD.03.02	Describe the measurement standards used in the manufacturing industry.
CADD.03.03	Determine the proper dimensioning styles for a variety of applications.
CADD.03.04	Apply dimensioning to various objects and features.
CADD.03.08	Demonstrate the methods of creating a title block.
CADD.04	Identify, describe, and utilize the basic hardware and operating systems used in CADD.
CADD.04.01	Identify and describe various types of hardware and software.
CADD.04.03	Define and apply computer terminology
CADD.04.07	Identify the hardware requirements of a given CADD software package.
CADD.05	Utilize Proper projection techniques to develop orthographic and pictorial drawings.
CADD.05.01	Understand the commands and concepts necessary for producing drawings through traditional or computer-aided means.
CADD.05.13	Generate a 2-D multi-view drawing.
CADD.06	Demonstrate use and application of alternate view applications and functions.
CADD.06.05	Create a 2-D drawing from a 3-D model.

CADD.06.06	Create a 3-D model from a 2-D drawing
CADD.07	Create assemblies and view in 3-D format.
CADD.07.01	Create an assembly in 3-D geometry
CADD.08	Explain and Utilize the concepts of sketching and the sketching process used in preliminary design and development.
CADD.08.01	Produce two- and three- dimensional sketches and designs
CADD.08.02	Use sketching techniques as they apply to a variety of objects.
CADD.08.04	Explain the purpose of sketching and how it applies to design.
ENG.01	Identify the roles, responsibilities and requirements of engineering.
ENG.01.01	Describe the following engineering fields: mechanical, chemical, civil, and electrical.
ENG.01.02	Identify the following job functions and responsibilities: research and development, design, production, supervision, management, testing, and analysis in mechanical, chemical, civil, and electrical engineering.
ENG.02	Use the design process to solve problems by creating and refining prototypes.
ENG.02.01	Identify the components of the design process: define the problem, brainstorm, research, develop solutions, prototype, test/evaluate, and communicate results.

The following course goals derive from the Common Core State Standards Initiative:

CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.

CCSS.Math.Practice.MP2 Reason abstractly and quantitatively.

CCSS.Math.Practice.MP4 Model with mathematics

CCSS.Math.Practice.MP5 Use appropriate tools strategically.

CCSS.Math.Practice.MP6 Attend to precision.

CCSS.Math.Practice.MP7 Look for and make use of structure.

CCSS.Math.Practice.MP8 Look for and express regularity in repeated reasoning.

The following course goals derive from the 2024 ISTE standards:

1.4 Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
1.4.a Design Process	Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
1.4.d Open-Ended Problems	Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems

COURSE ENDURING UNDERSTANDINGS

Students will understand that...

- The engineering and design process plays an important role in the creation of everything they use.
- CADD programs allow students to design and create multiple objects that they can use.
- They have the ability to achieve success in creation of projects.

COURSE ESSENTIAL QUESTIONS

- Why is it important that everyone understands and follows the safety procedures in and around the lab?
- Why is precision important in design and engineering?
- What is Engineering?
- What tools and processes do professional design engineers utilize when constructing drawings?
- Why is Computer Aided Drafting important to the fields of engineering?
- How do individuals use 3-D drafting to create objects we use in everyday life?

COURSE KNOWLEDGE & SKILLS

- Students will know . . .
 - how to create a pencil & paper mechanical drawing
 - how to create a 2-D drawing of an object
 - how to create a 3-D drawing of an object
 - how to measure correctly
- Students will be able to . . .
 - Use CADD programs to create technical drawings
 - Read & interpret technical drawings
 - Identify and solve problems encountered when creating drawings
 - Work and think independently
 - Work collaboratively when called upon.

COURSE SYLLABUS

Course Name Drafting and Design

Level Elective

Prerequisites None

General Description of the Course

This half-year course is designed to introduce students to technical drawing and design. The class will learn the basics of paper and pencil drawing and apply concepts learned when using computers for their drawings. Students will progress from two-dimensional drawing using AutoCAD to three-dimensional drawing using Onshape. Students will have the opportunity to print their designs on a 3D Printer.

Assured Assessments

Formative Assessments:

- o Measuring Practice
- o Marshmallow Challenge
- o Unit Quizzes
- o Drawings

Summative Assessments:

- o General lab safety Assessment
- o Engineering/Alphabet of lines Quiz
- o AutoCAD Drawing Assessment
- o Balsa Wood Tower
- o OnShape Drawing Assessment
- o 3-D Printing Project

UNIT 1

Lab Safety

Unit Goals

At the completion of this unit, students will:

WM.02	Describe and demonstrate the procedures related to workplace and job-site safety including personal protective equipment, machine safety, and material handling practices.
WM.02.01	Demonstrate safe material handling practices
WM.02.02	Demonstrate and explain knowledge of workplace safety procedures.

Unit Essential Questions

- Why is it important that everyone understands and follows the safety procedures in and around the lab?

Unit Scope and Sequence

- Locations of emergency equipment.
- Fire escape route.
- Proper use of personal safety practices and personal protective equipment (PPE).

Unit Assured Assessments

Summative Assessments:

- Written assessment covering key points on lab safety.

Resources

Core

- Safety Data Sheets
- Safety worksheets

Supplemental

- Note taking worksheets

Key Vocabulary

- SDS
- PPE

Time Allotment

- Approximately 2 Days

UNIT 2 Measurement

Unit Goals

At the completion of this unit, students will:

WM.04	Explain and be able to demonstrate the methods involved in turning raw materials into useful products.
WM.04.05	Describe and identify fractional measurements from a basic plan and assembly drawings.
WM.04.08	Measure accurately to a sixteenth of an inch.
CADD.03	Utilize measurement and annotation systems as they apply to CADD technology design.
CADD.03.01	Explain how the various measurement systems are used in CADD drawings.
CADD.03.02	Describe the measurement standards used in the manufacturing industry.

Unit Essential Questions

- Why do we need to be able to read a ruler?

Unit Scope and Sequence

- Provide unit material at varied reading levels using multiple resources
- Teach the sixteen parts of an inch using 3-foot-long scale model of an inch as a visual
- Division of measurements
- Using a square for measuring and marking

- Measuring to the nearest $1/16$ ", $1/8$ ", $1/4$ ", $1/2$ "
- Converting inches to feet and feet to inches
- Greatest Common Divisor: Divide numerator and denominator by the greatest common divisor
- Mechanical Scale
- Engineer Scale
- Scaling drawings
- Scale of measurement in a plan/drawing

Unit Assured Assessments

Formative Assessment:

- Measuring worksheets: $1/16$ ", $1/8$ ", $1/4$ ", $1/2$ "

Summative Assessment:

- Written Measuring Assessment that aligns with the teacher-constructed note-taking guide

Resources

Core

- Measuring Handouts

Supplemental

- [The Ruler Game](#)

Key Vocabulary

- **Nominal Measurement**
- **Actual Size**
- **Fractional**
- **Mechanical Scale**
- **Engineer Scale**
- **Scale Drawings**

Time Allotment

Approximately 2 Days

UNIT 3

Engineering

Unit Goals

At the completion of this unit, students will:

ENG.01	Identify the roles, responsibilities and requirements of engineering.
ENG.01.01	Describe the following engineering fields: mechanical, chemical, civil, and electrical.
ENG.01.02	Identify the following job functions and responsibilities: research and development, design, production, supervision, management, testing, and analysis in mechanical, chemical, civil, and electrical engineering.
ENG.02	Use the design process to solve problems by creating and refining prototypes.
ENG.02.01	Identify the components of the design process: define the problem, brainstorm, research, develop solutions, prototype, test/evaluate, and communicate results.

Unit Essential Questions

- What is Engineering?

Unit Scope and Sequence

- What is Engineering?
- What is the design process?
- How do engineers use the design process to solve problems?
- Marshmallow challenge

Unit Assured Assessments

Formative Assessment:

- Marshmallow Challenge

Summative Assessments:

- Engineering Quiz

Resources

Core

- [Power point presentation](#)

Key Vocabulary

- **Engineering**
- **Engineering Design Process**
- **Design**
- **Ideate**
- **Implementation**
- **Test**
- **Prototype**
- **Iterate**

Time Allotment

Approximately 3 Days

UNIT 4 Mechanical Drafting

Unit Goals

At the completion of this unit, students will:

CADD.02	Analyze the use of current CADD design technology.
CADD.02.04	Describe and demonstrate the use of graphic communication skills through sketching
CADD.02.11	Identify basic geometric elements (e.g., lines, circle, rectangle, sphere, and cube.)
CADD.03	Utilize measurement and annotation systems as they apply to CADD technology design.
CADD.03.08	Demonstrate the methods of creating a title block.
CADD.08	Explain and Utilize the concepts of sketching and the sketching process used in preliminary design and development.
CADD.08.02	Use sketching techniques as they apply to a variety of objects.
CADD.08.04	Explain the purpose of sketching and how it applies to design.

Unit Essential Questions

- What tools and processes do professional design engineers utilize when constructing drawings?

Unit Scope and Sequence

- Sketching
- Lettering
- Alphabet of lines
- Drafting Medium
- Drafting techniques
- Title block

Unit Assured Assessments

Summative Assessments:

- Alphabet of lines quiz
- Drawings and/or products created

Resources

Core

- [Power point presentation](#)
- Demonstrations of the proper use and techniques for drafting equipment.
- Example of Mechanical Drawings
- Visual aides
- Worksheets

Supplemental

- Guided notes
- Extra drawings

Key Vocabulary

- **Alphabet of lines**
 - **construction line**
 - **visible line**
 - **hidden line**
 - **centerline**
 - **dimension and extension lines**
 - **leader line**
 - **sectional lines**
- **Sketching**

Time Allotment

Approximately 1 Week

Vision of the Graduate Experiences	
Critical Thinking & Problem Solving	Final Drawings
Communication	
Collaboration	

UNIT 5
2-D CADD

Unit Goals

At the completion of this unit, students will:

CADD.02	Analyze the use of current CADD design technology.
CADD.02.01	Apply conventional Computer Aided Drafting and Design process and procedures accurately, appropriately and safely.
CADD.02.05	Evaluate and select appropriate method of communication for a given problem.
CADD.02.08	Export and import images/files in a variety of file formats
CADD.02.09	Evaluate the choice and placement of dimensions, notes and annotations to clearly communicate design intent.
CADD.02.11	Identify basic geometric elements (e.g., lines, circle, rectangle, sphere, and cube.)
CADD.03	Utilize measurement and annotation systems as they apply to CADD technology design.
CADD.03.01	Explain how the various measurement systems are used in CADD drawings.
CADD.03.02	Describe the measurement standards used in the manufacturing industry.
CADD.03.03	Determine the proper dimensioning styles for a variety of applications.
CADD.03.04	Apply dimensioning to various objects and features.
CADD.03.08	Demonstrate the methods of creating a title block.
CADD.04	Identify, describe, and utilize the basic hardware and operating systems used in CADD.

CADD.04.01	Identify and describe various types of hardware and software.
CADD.04.03	Define and apply computer terminology
CADD.04.07	Identify the hardware requirements of a given CADD software package.
CADD.05	Utilize Proper projection techniques to develop orthographic and pictorial drawings.
CADD.05.01	Understand the commands and concepts necessary for producing drawings through traditional or computer-aided means.
CADD.06	Demonstrate use and application of alternate view applications and functions.
CADD.06.05	Create a 2-D drawing from a 3-D model.
CADD.08	Explain and Utilize the concepts of sketching and the sketching process used in preliminary design and development.
CADD.08.02	Use sketching techniques as they apply to a variety of objects.
CADD.08.04	Explain the purpose of sketching and how it applies to design.

Unit Essential Questions

- Why is Computer Aided Drafting important to the fields of engineering?

Unit Scope and Sequence

- CAD Hardware and Equipment
- CAD Software
- CAD drafting techniques
- CAD Commands
- CAD Single View drawings
- CAD Geometry of Drafting
- CAD Isometric drawing
- CAD Orthographic projections
- CAD Dimensioning
- CAD Title block

Unit Assured Assessments

Formative Assessment

- Quizzes and test on unit material
- Drawings and/or products created

Summative assessment

- Balsa Wood Tower Challenge

Resources

Core

- Power point presentation
- Demonstrations of CAD commands
- CAD Drawings
- Visual aides
- Worksheets
- Balsa wood tower challenge materials
- Autodesk software
- Autocad software

Supplemental

- Guided notes
- Extra drawings

Key Vocabulary

- Offset
- Trim
- Fillet
- Chamfer
- Tangent
- Array
- Centerline
- Radius
- Diameter
- Polyline

Time Allotment

Approximately 8 Weeks

Vision of the Graduate Experiences	
Critical Thinking & Problem Solving	Final Drawings Balsa Wood Challenge
Communication	Balsa Wood Challenge
Collaboration	Balsa Wood Challenge

UNIT 6 3-D CADD

Unit Goals

At the completion of this unit, students will:

CADD.02	Analyze the use of current CADD design technology.
CADD.02.07	Express a design of an object as a 3-D model
CADD.03	Utilize measurement and annotation systems as they apply to CADD technology design.
CADD.03.03	Determine the proper dimensioning styles for a variety of applications.
CADD.03.04	Apply dimensioning to various objects and features.
CADD.03.08	Demonstrate the methods of creating a title block.
CADD.04	Identify, describe, and utilize the basic hardware and operating systems used in CADD.
CADD.04.01	Identify and describe various types of hardware and software.
CADD.04.03	Define and apply computer terminology
CADD.04.07	Identify the hardware requirements of a given CADD software package.
CADD.05	Utilize Proper projection techniques to develop orthographic and pictorial drawings.
CADD.05.01	Understand the commands and concepts necessary for producing drawings through traditional or computer-aided means.
CADD.05.13	Generate a 2-D multi-view drawing.

CADD.06	Demonstrate use and application of alternate view applications and functions.
CADD.06.05	Create a 2-D drawing from a 3-D model.
CADD.06.06	Create a 3-D model from a 2-D drawing
CADD.07	Create assemblies and view in 3-D format.
CADD.07.01	Create an assembly in 3-D geometry
CADD.08	Explain and Utilize the concepts of sketching and the sketching process used in preliminary design and development.
CADD.08.01	Produce two- and three- dimensional sketches and designs
CADD.08.02	Use sketching techniques as they apply to a variety of objects.
CADD.08.04	Explain the purpose of sketching and how it applies to design.

Unit Essential Questions

How do individuals use 3-D drafting to create objects we use in everyday life?

Unit Scope and Sequence

- Introduction to three dimensional drafting
- 3-D Software
- 3-D drafting commands
- Creating 3-D drawings
- 3-D Printer

Unit Assured Assessments

Summative assessment

- Quizzes and test on unit material
- Drawing and/or products created
- Self Evaluation

Resources

Core

- OnShape software
- Autodesk Inventor software
- 3D printer and printing supplies

Supplemental

- 3-D Printing Project

Key Vocabulary

- Extrude
- Assembly
- Part
- Scale
- Isometric
- Origin Point
- Plane
- Sketch
- Revolve

Time Allotment

Approximately 8 Weeks

Vision of the Graduate Experiences	
Critical Thinking & Problem Solving	Final Drawings
Communication	3-D Project
Collaboration	3-D Project

CREDIT

Half-year .5 credit

PREREQUISITES

None

CURRENT REFERENCES

- French, Thomas E., et al. *Mechanical Drawing*. 12th ed., Glencoe/McGraw-Hill, 1997.
- [Online AutoCad Training Materials](#)
- [Online Onshape Training Materials](#)

ASSURED STUDENT PERFORMANCE RUBRICS

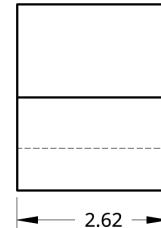
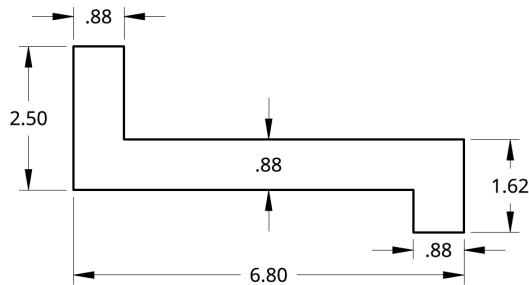
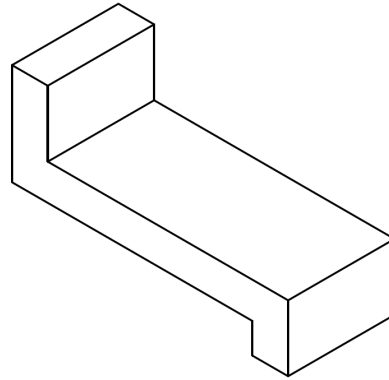
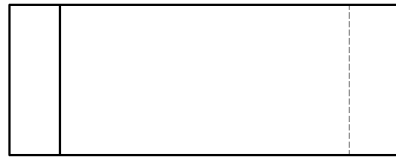
- Trumbull High School Vision of the Graduate Rubrics

OTHER RESOURCES

- [Onshape](#)
- [The Ruler Game](#)
- [AutoCAD Project Packets](#)
- [AutoCAD Help Worksheets](#)
- [Onshape Drawing Worksheets](#)

ASSURED STUDENT PERFORMANCE RUBRICS

Sample 3-D Grading Rubric



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES .XX = ±.0- .XXX = ±.00- .XXXX = ±.000- SURFACE FINISH	NAME	DATE	TITLE Stop		
	DRAWN	JOSEPH AMATURO			05/18/2023
	CHECKED				
	APPROVED				
DO NOT SCALE DRAWING			SIZE	DWG NO.	
BREAK ALL SHARP EDGES AND REMOVE BURRS			A	Fig. 5-58	
THIRD ANGLE PROJECTION	MATERIAL	FINISH	SCALE	WEIGHT	
			1:2		
			SHEET	1 of 1	

Grading Rubric Part

1. Sketch/Extrusions 5pts

Grading Rubric Drawing

1. Dimensions 7pt
1. Title/Drawing # 2pts
2. Scale 1 pt
3. Hidden Lines 2pts
4. Isometric View 1pt
5. Front/Top/Right view 3pts
6. PDF 1pt

Total Points: 22pts

Names: _____

Balsa Wood Tower Grading

Autocad Category:

	Yes	No
Did you submit a PDF Autocad file of your <u>dimensioned</u> structure? (5 pts)		
Did you submit a PDF Autocad file of your <u>non-dimensioned</u> structure that we used as a template? (5 pts)		
Does your Autocad drawing match your finished structure?(5 pts)		

Point Total: _____

Size Specification Category:

Actual measured height- _____

Actual measured width at base (include length & width- _____

Actual measured width at top- _____

Checklist: (5 pts ea)

	<i>Student Self Grade</i>		<i>Teacher Grade</i>	
	Yes	No	Yes	No
Is the height 18" +/- 1/4"?				
Is the length & width of the base less than 4"x4"?				
Is the length and width of the top between 2" and 3"?				
Is the top of the tower flat?				
Does your tower have at least 3 or 4 sides?				
Are there pieces of wood laminated in places other than the vertical corners?				
Is there excess glue in corners, or on wood joints?				
Center of the tower is at least 1" to allow the test rod to pass through?				

Point Total: _____

Load Category:

Weight of tower (in ounces)- _____

	Weight (lbs)	Weight (oz)
Weight of test plate and threaded rod		
Weight of bucket and sand		
Total weight the tower held		

Efficiency= Weight held (lbs. converted to oz.) / Weight of the tower (oz.)

Efficiency: _____

Our structure was able to hold _____ x its own weight.

Skill Rubric: Communication 9-12 (currently under revision)

Indicator of Attainment	Beginning 1	Meets 2	Exceeds 3	Score
<p>PURPOSE</p> <p>Expresses ideas in alignment with the intended purpose.</p>	<p>Limited demonstration of understanding. Purpose is not identified and/or not fully articulated.</p> <p>Does not or partially expresses ideas in alignment with purpose.</p>	<p>Purpose is identified and articulated but may be occasionally unclear.</p> <p>Expresses ideas with purpose.</p>	<p>Purpose is identified and clearly articulated and enhanced.</p> <p>Clearly expresses ideas in alignment with the intended purpose.</p> <p>Makes connections beyond the intended purpose.</p>	
<p>AUDIENCE</p> <p>Demonstrates an awareness of the intended audience.</p>	<p>Demonstrates little to no awareness of the audience.</p> <p>Language and content is inappropriate and/or ineffective for the audience.</p>	<p>Demonstrates an awareness of the audience.</p> <p>Language and content is appropriate and helps the audience understand the topic/position.</p>	<p>Clearly and consistently demonstrates a complete awareness of the intended audience by connecting to the audience and adjusting as needed. Engages with and responds to the intended audience in a developmentally appropriate manner.</p> <p>Language and content is appropriate and precise which helps the intended audience further understand the topic/position.</p>	
<p>ORGANIZATION</p> <p>Organizes and supports ideas in alignment with the intended purpose.</p>	<p>The organizational structure is not and/or minimally effective for the purpose.</p> <p>The topic/position is not focused and/or minimally supported by details.</p>	<p>Effective organizational structure supports the purpose.</p> <p>The topic/position is focused, well thought out, and supported by accurate and effective details.</p>	<p>Clearly expresses ideas in alignment with the intended purpose. Purpose is clearly identified and connections are made beyond the intended purpose.</p> <p>Substantive and accurate details support and extend the topic/position with exceptional development, specificity, and depth.</p>	
<p>LISTENING</p> <p>Receives and responds to ideas in alignment with the intended purpose.</p>	<p>Limited to no ability to listen to others.</p> <p>Unable to ask relevant questions.</p> <p>Can not paraphrase/restate the message.</p>	<p>Listens to, evaluates, and responds to others.</p> <p>Asks relevant questions.</p> <p>Demonstrates understanding by accurately paraphrasing/restating the message.</p>	<p>Actively listens to, evaluates and responds to others.</p> <p>Asks relevant questions that indicate an interest to learn more and understand further.</p> <p>Demonstrates understanding by accurately paraphrasing/ restating the message and expanding upon the ideas presented.</p>	

SCORING

Beginning: 4 - 6

Meets: 7 - 8 GOAL

Exceeds: 10 - 12

__ / 12

Skill Rubric: Collaboration 9-12 (currently under revision)

Indicator of Attainment	Beginning 1	Meets 2	Exceeds 3	Score
<p>PLANNING</p> <p>Works effectively with and is receptive to the ideas/contributions of group members.</p>	<p>Does not or lacks a discussion on the strengths of each group member.</p> <p>Does not define group roles.</p>	<p>Assigns roles and defines contributions of those in the group.</p> <p>Suggests ways the group can approach the task.</p>	<p>Assigns roles and defines contributions based upon the unique knowledge, abilities, or interests of those in the group.</p> <p>Plans the approach to the task and anticipates challenges and resolutions.</p>	
<p>COMMUNICATION</p> <p>Thinks with the group and acknowledges multiple perspectives.</p>	<p>Does not or rarely listens to the thinking of the group.</p> <p>Provides little to no feedback.</p>	<p>Utilizes the thinking of the group in order to work toward the completion of the task.</p> <p>Provides feedback.</p>	<p>Synthesizes and expresses the multiple perspectives of the group in order to complete the task.</p> <p>Provides feedback that improves the quality of the task.</p>	
<p>CONTRIBUTION</p> <p>Works with others to complete a task and shares the credit.</p>	<p>Little or no contribution to the task.</p>	<p>Shares work, reviews others' contributions and offers general feedback.</p>	<p>Shares work beyond the individual task, constructively critiques others' contributions, and offers feedback to improve the overall quality of the task.</p>	
<p>REFLECTION</p> <p>Monitors individual and collective contributions of each group member throughout the completion of the task.</p>	<p>Little or no reflection on ways to adjust the group's collaboration process throughout the task/product.</p> <p>Focuses only on individual contributions to the task.</p>	<p>Reflects and suggests individual and/or collective contributions to adjust the group's collaboration process to improve the quality of the task.</p>	<p>Applies relevant and diverse individual and collective contributions to monitor and adjust the quality of the task.</p>	

SCORING

Beginning: 4 - 6

Meets: 7 - 8 GOAL

Exceeds: 10 - 12

__ / 12

SKill Rubric: Critical Thinking/Problem Solving 9-12 (currently under revision)

Indicator of Attainment	Beginning 1	Meets 2	Exceeds 3	Score
<p>UNDERSTANDING</p> <p>Identifies the problem, question or issue being addressed.</p>	<p>Exhibits limited and/or no understanding of key concepts.</p>	<p>Exhibits an understanding of key concepts.</p>	<p>Exhibits a thorough and accurate understanding of key concepts and can access those concepts from multiple perspectives.</p>	
<p>PLANNING</p> <p>Applies systematic thinking and selects strategies to address the problem, question or issue.</p>	<p>Shows limited to no evidence of a plan, model or strategy to solve a problem.</p>	<p>Shows a plan, model or strategy to solve a problem.</p>	<p>Shows innovative and creative thinking to solve a problem.</p>	
<p>QUESTIONING</p> <p>Analyzes relevant information related to the problem, question or issue.</p>	<p>Unable to or has difficulty questioning and analyzing numerical, written, or visual data and identifying related evidence.</p>	<p>Questions and analyzes numerical, written, or visual data and selects the relevant evidence.</p>	<p>Questions and analyzes numerical, written, or visual data and selects the most relevant and impactful evidence.</p> <p>Describes why different approaches to a problem or situation could yield the same or similar results.</p>	
<p>REFLECTION</p> <p>Makes evidence-based conclusions/solutions and makes adjustments as needed to address the problem, question or issue.</p>	<p>Solution is inadequately supported or supported with minimal evidence, limited analysis of data and relevant information.</p>	<p>Solution is accurately supported by evidence and the student makes conclusions based on appropriate evidence.</p>	<p>Solution is thorough, accurate, and evidence-based.</p> <p>Shows extensive, thoughtful and reflective thinking on how a problem is solved and makes adjustments as needed.</p>	

SCORING

Beginning: 4 - 6

Meets: 7 - 8 GOAL

Exceeds: 10 - 12

__ / 12

**Disposition Rubrics 9-12
Draft Rubrics**

Draft Rubrics/Frameworks (9-12)
<ol style="list-style-type: none"> 1. Self-Efficacy 2. Growth Mindset 3. Innovation 4. Emotional Intelligence 5. Integrity

DRAFT Self-Efficacy 9-12

**PORTRAIT OF A GRADUATE
- GRADES 9-12**

Definition: Self-Efficacy is the belief that you are capable of successfully performing a task or managing a situation.

Reflective Opportunities	<p>A secondary student may demonstrate self-efficacy by:</p> <ul style="list-style-type: none"> ● Asking for extra help to clarify a concept in math class so he/she can complete the homework with success. ● Dealing with frustration by taking a deep breath and reminding herself that she can look back at the textbook and go to extra help before the test. ● Participating in class discourse despite being unsure of the answer ● Tackling new challenges with a positive attitude ● Using positive self talk while playing sports even when losing ● Entering a new grade and thinks that she will pass all of her classes, even though she struggled in the past. ● Setting personal goals and celebrating successes ● Confidently participating in class discussions ● Willingly accepting feedback from students and peers ● Standing up for yourself or a peer after observing name calling 	Areas of Growth
	Feedback to Students	
	Goals (growth areas) for Future Learning	

**PORTRAIT OF A GRADUATE
- GRADES 9-12**

Definition: The belief that one that can improve their intelligence or skills through continued hard work and adapt when faced with challenges.

<p>Reflective Opportunities</p>	<p>A secondary school student may demonstrate a growth mindset by...</p> <ul style="list-style-type: none"> ● Analyzing errors on assessments with the intent to expand their learning ● Exhibiting grit in task completion regardless of obstacles ● Setting, adapting, and completing short term and long term goals ● Understand that failure is a part of being a life-long learner, and responds with persistence and/or trying other methodologies ● Shows resourcefulness by consulting with other entities as needed in order to find ways to accomplish a task ● Taking breaks when needed in order accomplish small components towards the larger goal ● Identify the leverage aspects of a task that will move completion forward ● Exhibiting flexibility and adaptability while going through the process of goal setting ● Develop a path to succeed by evaluating one’s own abilities ● Shows drive and motivation with an end goal in mind. ● Continuing in a course of action, using discouragement, opposition or previous failure as learning opportunities to continue towards achieving goals. 	<p>Areas of Growth</p>
	<p>Feedback to Students</p>	
	<p>Goals (growth areas) for Future Learning</p>	

**PORTRAIT OF A GRADUATE
- GRADES 9-12**

Definition: Innovation is the ability to look at something familiar and see new possibilities, which leads to curiosity about new learning and the desire to create something original or imaginative

<p>Reflective Opportunities</p>	<p>Behavioral Examples: A secondary school student may demonstrate innovation/creativity/curiosity by...</p> <ul style="list-style-type: none"> ● Giving a presentation that has a high degree of creativity. ● Trying a unique, different method to solve a problem instead of the one shown by the teacher ● Incorporating new technology, such as creating a podcast, to enhance their final project in class. ● Independently researching a topic from class that was of particular interest ● Expressing excitement about the opportunity to do/try something new ● Suggests a new and different approach to the assignment, such as creating a song instead of writing an open ended response ● Demonstrating eagerness to take learning beyond the classroom, like researching your own family history after learning about ancestry ● Asking questions to intellectually challenge teachers and peers ● Designing or improving new processes or approaches ● Generating ideas for how to approach the group project 	<p>Areas of Growth</p>
	<p>Feedback to Students</p>	
	<p>Goals (growth areas) for Future Learning</p>	

**PORTRAIT OF A GRADUATE
- GRADES 9-12**

Definition: Students exhibit an aptitude for being able to identify how and why they are feeling, and how to regulate and address those emotions.

<p>Reflective Opportunities</p>	<p>A secondary school student may demonstrate emotional intelligence by...</p> <ul style="list-style-type: none"> ● Showing empathy for others; for example, understanding when a classmate may not be able to complete an assignment at the same level. ● Working with classmates cooperatively despite differences. ● Using strategies to regulate their own emotions and behaviors and/or helps peers when they are frustrated or sad. ● Exercising empathy in a way that spreads joy and positivity through representing the strengths of others or the situation (eg. we have the materials to finish the project or our differences in the team give us strengths to accomplish goals even better than on our own) ● Accurately expressing their emotional state when faced with frustration (eg. failing a test, not being asked to the dance) ● Talking about conflicts such as deciding on roles in a group in order to respectfully and sensitively find solutions ● Encouraging classmates to behave properly for a substitute teacher (showing self-control of their behavior and emotions). ● Building relationships despite differences (has friends with different abilities and backgrounds) ● Recognizing group dynamics during collaborative tasks and communicating so that roles are distributed with sensitivity (choosing teammates for a sport or project, volunteering for roles, suggesting configurations sensitively) ● Accepting responsibility for actions after making a mistake ● Honoring classmates in their work together by understanding people have different perspectives and ways of expressing their emotions. ● Handling setbacks and adapting when things don't go according to plan. ● Following through with commitments showing reliability and trustworthiness with peers and adults. ● Demonstrates confidence by volunteering to present materials to a large crowd for the first time. 	<p>Areas of Growth</p>
	<p>Feedback to Students</p>	
	<p>Goals (growth areas) for Future Learning</p>	

**PORTRAIT OF A GRADUATE
GRADES 9-12**

Definition: Integrity is doing the right thing even when it's hard or when no one is looking.

<p>Reflective Opportunities</p>	<p>A secondary school student may demonstrate integrity by...</p> <ul style="list-style-type: none"> ● Showing up on time to class and doing homework in a timely manner ● Noticing when another student drops her/his books in the hallway, and helps to pick them up ● Returning a wallet that is found in the parking lot with the content intact ● Helping an individual who is struggling with learning - offers to help with Algebra homework by solving similar problems (peer to peer learning) ● Volunteering to help with a service project with the Trumbull Food Bank-creates flyers and collects canned food items with permission from the principal. ● Respecting her peer who is wearing a sari ● Speaking up when student overhears a peer being teased and/or by privately letting the teacher know what happened/Name calling is hurtful, think before you speak ● Advocating for a peer after observing another student calling someone names ● Volunteering to help at practice for the Unified basketball team. ● Taking pride in their work and behaviors ● Using school resources such as WeVideo appropriately; when asked to use it for school assignments and not personal video making, the students only created the science video to document learning. ● Dressing and accessorizing in their own style and confidently walking into school regardless of the reactions of others. Be yourself in the face of adversity ● Modeling appropriate behavior and ignoring negative?bad? behavior when provoked by others 	<p>Areas of Growth</p>
	<p>Feedback to Students</p>	
	<p>Goals (growth areas) for Future Learning</p>	